Norman Eason's "Maintenance and Asset Management Information Systems"

Chapter 7

Functions

How to ensure that the functions you need are the functions you get

This is probably the most obvious Area of Divergence between the maintenance requirements of different organisations. When I first began to consider the differences between organisations, it was common practice to describe a maintenance management system as having an asset register, a work control module, a stores module and a personnel module. Organisations bought these early packages because **every** maintenance operation needed to record its assets, control its work, issue and consolidate its stores and record the skills and timekeeping of its personnel. Now if we move down a level in, say, the work module and examine what these early systems did, we find that work consisted of **planned work** and **unplanned work**. That was still OK as everyone did planned and unplanned work. However, when we asked how planned work was scheduled, we found that some scheduled by the week, month, quarter, etc. **from the date at which the previous work was planned** while others scheduled **from the date at which the previous work was done**. Some of these early package suppliers argued that one way was right and some claimed that the other was correct. In fact, both were correct, although clearly some user organisations operated in one way and some in the other. As use of maintenance information systems developed, user organisations of course found good

reasons to handle both types of planning. Then, of course, there was the problem of how they handled contention between both types of planned work and the scheduling of their corrective work. They also had the problem of deciding whether or not to include the tasks of higher frequency jobs in lower frequency jobs on the same asset. Once again, the result was that there were many ways in which these activities could be performed and that all were correct, depending upon the manner of operation of each organisation.

"Now there are hundreds of functions on the average maintenance or asset management system and, while the intention is that these can be used by virtually any organisation, the majority of these imply a particular method of working"

And so it has gone on throughout the development first of maintenance information systems and then of asset management information systems. Now there are hundreds of functions on the average maintenance or asset management system and, while the intention is that these can be used by virtually any organisation, the majority of these imply a particular method of working. Also, many functions rely on the existence of several other functions to set up the data that they will use. Thus we have groups of functions which perform a **super-function** which is relevant to a particular way of working. A good example of this is the existence of groups of functions for departmental maintenance and asset management which on the surface appear to do exactly the same, but which operate on different data structures, enabling the asset management functions to address corporate requirements.

As we saw in Chapter 6 in relation to codes and structures, potential users of information systems must therefore come to the selection process having investigated their precise requirements for functions and how these functions need to relate to each other and to the data on the system. They must also know what compromises they are prepared to make and what they are not prepared to make. This may be difficult if there is no knowledge about what compromises you are going to be asked to make! (This will be discussed further in Chapter 14).

“Why not ask a selection of vendors to state and describe what they consider to be their Unique Selling Points, then question them and ask them to demonstrate the more interesting ones? Then come back to the privacy of your own organisation and present these features in relation to the draft specification”

The way around this problem is to do a first-cut investigation of systems in order to establish how they are likely to constrain your operation. This should not be related to any tight timescale for the eventual implementation of the system; it would be best to undertake this exercise several months before the actual selection process so that actual requirements modified by new ideas can be thrashed out internally beforehand. It must be remembered that vendors are not only competing with each other; they, perhaps more than anyone else, should know what advances are being made and can be made in the field of maintenance and asset management information systems. Were they not potentially biased, they would be a good source of information on what is and what is not possible with these systems! Here is a good example of the truth of the maxim that **the solution can help to define the problem**. User organisations don’t necessarily know what these systems can do; if they did, they would perhaps write their specifications differently. Without doubt, a specification needs to be written, but this could be in draft form, followed by an evaluation of what is possible in the marketplace.

Why not ask a selection of vendors to state and describe what they consider to be their Unique Selling Points, then question them and ask them to demonstrate the more interesting ones? Then come back to the privacy of your own organisation and present these features in relation to the draft specification. Obviously, this must be carried out in a professional and impartial manner. In this way, however, the problems and opportunities will be able to be examined without the imposition of a system selection and implementation deadline. In my experience, once a project has been planned and flow-charted, it takes on a life of its own which does not necessarily result in the achievement of the true objectives of the project. I shall be considering this in Chapter 14.

In most development projects, the deadline is almost more sacrosanct than the actual project itself.

Douglas K. Smith & Robert C. Alexander 'Fumbling The Future' 1988

I stated in an earlier chapter that when maintenance management information systems were first being marketed, it was common to rate these systems by the number of functions that they offered. There is absolutely no excuse for such a rating now. The software application area has long passed the time when it was attempting to cover all the functionality of maintenance or asset management. What is most important now is **how these functions, individually and in combination with each other, work to the benefit of the user**. As we shall see in Chapter 9, the **culture** of the user organisation will be a determining factor, so the function list, function relationships and function quality must be set against a **personal** set of requirements, and evolution of these requirements, for each user organisation. These functions must be backed by skills from the vendor directly related to the user's industry. If this is not the case, then the user must consider whether or not what he is being offered is too global.

Key Points in Chapter 7

Functions on information systems often imply particular methods of working.

Functions often rely on other functions to set up the data that they will use.

Groups of functions perform a **super-function** that is usually relevant to a particular way of working.

Before selecting an information system, potential users must investigate their precise requirements for functions and how these functions need to relate to each other and to the data on the system.

Investigate systems well in advance of the actual selection process in order to establish what constraints are likely to be imposed by them.

Ask vendors to define and demonstrate their Unique Selling Points.

In most development projects, the deadline is almost more sacrosanct than the actual project itself.

The measure of a good information system is not the number of functions but the way in which these functions, individually and in combination with each other, work to the benefit of the user.

The function list, function relationships and function quality must be set against a **personal** set of requirements, and evolution of these requirements, for each user organisation.

"Technology can be the source of competitive advantage

Or it can be the millstone that sinks the initiative"

Peter Sole, Wentworth Research

Chapter 8

Technology

I have made two previous references to technology so far. In Chapter 1, I said that the book would not cover technology as such, because the subject is a moving target and thus written text would diminish in relevance as soon as the ink was dry. The second reference was in Chapter 5 when I substituted technology for hardware as an Area of Divergence. So we shall consider technology, but we shall consider it as a generic factor affecting the selection and implementation of maintenance or asset management information systems with, as far as possible, little reference to specific technology or to the manner in which it is changing.

As we saw in Chapter 5, the main problem that **hardware** posed as an **Area of Divergence** was the 'lock-in' that many hardware vendors imposed on their customers. This was primarily due to the operating systems that were unique to each hardware family, resulting in all software having to be written in different versions for the targeted operating systems. A real **Area of Diversity** was thus the fact that a user organisation could only consider those maintenance and asset management information systems that had either been designed for their operating system or had been transferred to that operating system. A major problem at the time was that, while a system may have been able to operate on a second or third operating system, its performance may have been poorer on these systems than the one for which it was targeted. In some cases, the performance of the system on **all** the operating systems on which it was offered was poorer than if it had been designed to run on only one operating system. This was because the designers only used common facilities and did not make use of any special features of a single operating system in order to limit transfer problems.

“ ‘Lock-in’ is now no longer seen as a major difficulty, perhaps because most user organisations accept the more subtle forms of lock-in by which they are tied ”

Trends

So do we think that these problems have vanished with the demise of the large computer suppliers who locked in their users? I believe that there are still problems, there will continue to be problems, but they will be different problems. There is still a measure of lock-in, but there are fewer suppliers of hardware and operating systems who are causing the lock-in. This situation is also likely to continue, although the relative positions of the hardware and operating system vendors will undoubtedly change.

‘Lock-in’ is now not the problem that it was when the original **Areas of Divergence** were defined, and is now no longer seen as a major difficulty, perhaps because most user organisations accept the more subtle forms of lock-in by which they are tied. This subtlety is most at work in hardware and software **trends** – in both senses of the word! Ever since the introduction of Windows in the early Nineties, users have been subject to this influence. The phenomenon is best explained by describing the situation in relation to the procurement of maintenance and asset management information systems shortly after Windows was introduced. Soon after this introduction, virtually **all** procurement specifications had Windows as a mandatory requirement that had to be available and demonstrable at the time of selection. As most of the really powerful maintenance and asset management information systems were by their nature difficult, time-consuming and costly to convert to Windows, many user organisations found that they had only a very few systems that complied with this requirement. Also, these systems tended to be functionally and structurally more simple than their former major competitors. The market thus became inverted and effectively stagnated from a total capability viewpoint until the larger systems were converted to Windows and the ‘early Windows

The advent of Windows

suppliers' had progressed their systems to provide more functionality and structure.

Now it could be said that the market ultimately gained from a wider range of vendors who could compete with functionality, structures **and** Windows. However, there is no doubt that in the intervening three or four years several users procured systems because of the **trend** into Windows, concentrating on the Windows capability to the detriment of their actual functional and structural requirements. Many of these 'trend pioneers' ended up later by replacing their systems with more capable systems, albeit also with a Windows capability. Whether or not they were correct to go for Windows early on will, of course, have been debated at length within their own organisations; some of these decisions will have been exonerated and some procurers will have been asked to find other jobs! The point I would like to make is that the **trend** in technology was a factor that determined which systems were chosen and we cannot rule out the influence of other such technology trends in the decision process.

Unfortunately, it is not always easy to recognise when one is in the middle of such trends and when one's decisions are being so influenced! As we shall see in the final section of this chapter, it would take a very brave individual to stick to his guns against his staff, his I.T. department and his management and say that his functionality and structures are far more important than the trends in technology that they are advocating. This is especially difficult when the trends are changing rapidly in importance and relevance, and when he has enough to do to keep his department running without keeping up to date with technology! But it is just such bravery that is required.

If yours is the targeted department and the technology does not work for you, then the technology does not work!

Other Technological Factors

I shall group the next three technology topics together as they are fundamentally related to each other. They are **Compliance, Currency and Relevance,** and **Obsolescence**. By compliance, I am referring to adherence to the version number of the operating system, system software or application software. (Very often, application software such as maintenance and asset management information systems rely for their capability on underlying **system software** which is supplied independently of the supplier of the operating system). The version numbers of the operating system, system software, and the maintenance or asset management information system are all likely to move independently of each other. There will, however, be a progressive dependency of system software on the operating system and of the maintenance or asset management information system on the other two. Clearly, vendors of any of these three would find it difficult to support all versions of their products, so it is customary for each of them to continue to support only the last two or three versions. A user organisation has to make a similar decision within its Information Technology Department; they also would find it difficult to support many versions of their chosen operating system, system software packages **and** the many application software packages that run on them. Thus the **Level of Compliance** defined by the suppliers of the three types of software packages and by the user organisation will tend to be a specific, unique factor for this combination of user and suppliers.

Following on from this combination is the **Currency and Relevance** of the technology within the organisation for the maintenance or asset management operation. How strictly are the compliance rules applied to this activity? What is the relationship between the Information Technology

The problem of 'internal compliance' where IT standards have been set up without regard to maintenance requirements

Department and the maintenance or asset management operation? How relevant are changes in versions of the operating system, the system software, or even the maintenance or asset management system to the real requirements of the user operation? In a nutshell, by how much are seemingly unrelated factors affecting the actual requirements of the user operation? The degree to which these factors affect these requirements represents an impact of technology and is thus a divergent factor.

We must also consider the problem of compliance with internal standards. I have come across many maintenance and asset management operations that have been 'computerised' by their Information Technology Department and been forced to comply with the 'standards' which had been previously set up by the I.T. Department. Unfortunately, these standards are often defined without considering the requirements of a maintenance or asset management operation but, through long use in primarily an office environment, will have been generally accepted as 'the way we use computers'. While I would not suggest that it is impossible for maintenance or asset management operations to comply with office-type computer access, it is a very big assumption that such an operation would be able to work effectively with no problems or restrictions. If a maintenance or asset management operation is to become computerised, then it is essential that the I.T. Department understand the current and ongoing requirements of the operation. It is also essential that the maintenance or asset manager (or his delegate) becomes familiar with the technology options and the constraints placed on them by his organisation's 'standards'.

The third factor in this group is **Obsolescence**. How often have you heard of an organisation that is replacing its 'old' technology with something 'up-to-date' and state of the art? In how many cases is the

What do we really mean by obsolescence? What actually is obsolescent?

term ‘obsolescence’ used to obscure some other reason or problem? What do we really mean by obsolescence? What actually is obsolescent? Is it the hardware that is obsolescent? This may well be the case, but it is unlikely to be due to its being worn out and inoperable. It becomes obsolescent because of its relationship with other entities such as software, company culture, strategies and, as we have seen above, trends. So decisions are taken to replace ‘old’ systems for reasons which are not directly due to the age of the existing equipment. Unfortunately, these decisions are often made in a ‘sweep everything aside and replace with the latest options’ manner, which is a costly, and not necessarily appropriate activity. I shall explain what I mean by describing a situation that occurred with one of my clients.

This organisation, a water utility, decided that it would replace its old, in-house designed maintenance management system with a new, expensive state-of-the-art asset management system with all the options that would ensure that they would be moved at once into the forefront of their industry – or so they thought!

Isn’t it surprising how many organisations believe that if they throw sufficient money at an activity, it must then become World Class?

There were two reasons for the move. The first was the high monthly cost of the mainframe system. The second was that the mainframe system was not able to cater for the changeover to the new century; and time was running out for them. It was a relatively simple exercise to calculate the payback time for the new system. They also found little difficulty in obtaining authorisation for the budgeted spend. However, they adopted this ‘sweep everything aside and replace with the latest options’ attitude. Furthermore, they gave themselves a ridiculously short timescale to write their

specification, survey the market, and select and implement a system. (Note that they intended **writing their specification <u>after</u> their budget had been approved**! This says much about both their maintenance operation and about the decision processes of their Board! We shall be considering this particular procurement exercise in more detailin Chapter 14).

A representative from the utility happened to attend a conference at which I was speaking. My subject was the Sanity Checking of projects for the implementing of maintenance and asset management information systems. This is where I conduct an impartial examination of the strategy, current status and likely outcome of such projects. This process will be described in more detail in Chapter 15. My remarks prompted the delegate from the utility to invite me along for a day to hear their plans and make my comments. When I said that they should stop everything and first define their maintenance strategy and have it approved, they said that they did not have time to do this! When I said that their timescale for examining the market and selecting a system was too short, they said that it **must** be done in the three months allotted to it. I asked why this was the case. They said that they only had three months because otherwise they could not hope to have the system up and running before the end of the century. Here I will refer readers to a quotation from 'Fumbling The Future' used in Chapter 7 – **In most development projects, the deadline is almost more sacrosanct than the actual project itself**.

When I talked the project through with the dozen or so representatives at the meeting, I listed the real, rather than the perceived, objectives of the implementation of the system. Firstly, the new information system would have to satisfy the requirements of their maintenance strategy, which was as yet undefined. Secondly, they would have to resolve the problem presented by the imminent change in the century. Thirdly, they wished to

“ the utility was never going to get a satisfactory long term solution without first defining their maintenance strategy and then writing a specification of requirements”

stop paying the high rental charges for the current mainframe system. The first of these, if properly implemented, would take a considerable amount of time, which would act against the achievement of the second and third objectives, but it would be completely wrong to abrogate this first, long term objective in order to satisfy the other two short term objectives. So we needed time for the first objective, but couldn't afford it because of the other two!

My suggestion, and the ultimate solution, was to separate the two conflicting areas and to address them in a lateral manner so that both were satisfied. To start with, the utility was **never** going to get a satisfactory long term solution without first defining their maintenance strategy and then writing a specification of requirements, so it was essential that they were given time to produce these documents. Then we had to get something up and running to replace the old system, not just because of its high monthly cost, but more importantly because of the end of the century. My solution was to procure and implement cheap maintenance packages that would meet the requirements of all their dispersed depots, with the ability to collect history centrally via a low-technology method every month. By selecting a package that met their current and immediate future requirements and which would be able to handle the new century, they would give themselves the breathing space that they needed in order to define their maintenance strategy and write an appropriate procurement specification for a replacement system.

In fact, the utility was able to obtain computers for the depots by using those that had been declared obsolete by other parts of their organisation. Thus, the only hardware cost was the addition of high-density media drives to transfer the monthly history back to the central computer, which was itself an ‘obsolete’ machine. The entire exercise was up and running within six months and, because the utility no longer had to pay the very

high rental for the mainframe computer system, the payback period for the complete system was less than one year. So, after one year, they were far better off financially than they would have been had they procured an expensive replacement, they overcame the changeover requirements for the new century, and they had time to define their new maintenance strategy. Actually, they were even better off than that. It is highly possible that the selected maintenance system, because of its progressive capability, will be able to accommodate the requirements of their new maintenance strategy, so at the end of the day they will have a total win-win situation.

Now the point that I would like to make from this story is that decisions were about to be made because of **obsolescence** that would have been totally wrong for the utility. The perceived obsolescence had generated an 'emotional need for change' that skewed the thinking and would have been expensive. One has to wonder what the thinking in the other parts of the organisation were to have resulted in so many 'obsolete' computers becoming available to be used for the maintenance operation!

User Perception

The final area that I would like to consider about technology is the **perception** of users. This area is linked to a certain extent to the previous area of obsolescence. It is a fact of life that people are everywhere bombarded by media that promotes change to newer and seemingly better versions of what they already have. This covers all aspects of life, but it is most pronounced in relation to technology. If it is not the latest, then you are encouraged to question its effectiveness!

Any sufficiently advanced technology is indistinguishable from magic.*Arthur C. Clark*

British Science-fiction Writer 'Profiles of the Future'

Now it would be quite wrong to say that such attitudes do not affect maintenance and asset management operations. After all, operatives in these areas are human and are therefore exposed to all these external influences in their non-working lives, so why should they not be so influenced? If we cannot honestly say that they will not be affected by such influences, then it is appropriate to consider what effect such attitudes will have on the successful implementation and use of our maintenance or asset management information systems. I shall illustrate the type of problem that can arise by relating a situation that one of my clients had some time ago.

The organisation was a process plant, producing their bulk product in competition not only with their company's competitors, but also with other, overseas plants owned by their company. They had done a sterling job of squeezing out much more product than that for which the plant was originally designed, with old plant that was long past its originally planned life. Sounds familiar? Everyone at the plant knew that they would have to squeeze even more production out of it if they were to be allowed to continue producing the product, or possibly even be allowed to continue as a site! But the maintenance workforce said that they were unable to do their job properly because their maintenance information system was old and they could not trust the data. Surprisingly perhaps, this resulted in a proposal to the local Board for the replacement of their maintenance management information system with a state-of-the-art system which it was hoped would solve the problem and enable the plant to become more efficient.

I was called in at the stage where they had selected the supplier and were about to place the order. However, when I examined the situation, I discovered that the problem was somewhat different from what had been stated. The current maintenance management system was indeed an old system; it was mainframe-based and

was designed and operated in-house. It was, however, highly capable, relevant to the industry and to the requirements of the site, and its functionality was superior in some respects to that of the proposed new system. Of course, the new system **looked new** and the old system **looked old-fashioned**. When I looked further into the system and its usage, I found that the workforce who had stated that they could not work with the old system were only using two of its functions, those required to receive new work and to record work done and faults and conditions found. But these two functions were **critical** to the data requirements of the organisation and thus to the effectiveness of the plant. Further investigation showed that there was very poor validation of the data entered via these functions and that the workforce was entering sloppy and incorrect data.

Now no new system would totally correct this situation, but the organisation was about to procure a very expensive system in the belief that it would solve their problems. Its expense and its inevitable failure would undoubtedly have closed the plant! As the existing system was perfectly capable of performing well for the next few years – as far as it was possible to see in relation to the plant and the industry at the time – and the workforce only used two (albeit very important) functions, my recommendations were in two parts. First, I recommended that a front-end system be produced which would contain the two important functions on a hand-held system which would look as state-of-the-art as possible, but would have validation checks for all important data and an efficient interface to the mainframe system. Second, I advised an exercise in the motivation and training of the workforce, identifying the importance of good data and its relevance to the criticality of the plant, the continued existence of the plant and the continuity of their jobs. The total solution cost a fraction of the estimated budget for the new system.

This example shows how perception of technology, in this case by the workforce, can skew the decision process. As with the other factors that affect procurement decisions, its relevance will depend upon the relationships within the organisation. It would be easy to dismiss them as not being relevant to your particular organisation, but this should not be done without some consideration of whether it **could** happen within your organisation.

Key Points in Chapter 8

Trends in technology are now influencing factors in the selection of systems.

It often is not easy to recognise when one is in the middle of a technology trend and when one's decisions are being influenced by it.

If yours is the targeted department and the technology does not work for you, **the technology does not work**.

Operating system, system software and application software will all move from version to version. User organisations must ensure that their **level of compliance** is under control and co-ordinated.

Changes in versions of operating system, system software or even application software can affect users of maintenance and asset management systems, not necessarily in a positive manner.

Maintenance and asset management operations are often obliged to comply with existing internal computing standards that were defined without their involvement or the consideration of their requirements.

Many organisations believe that if they throw sufficient money at an activity, it must then become World Class.

Perceived obsolescence can generate an 'emotional need for change' that can skew the real needs of an organisation.

Perception of technology by the workforce is a significant factor in the decision to select a new maintenance or asset management system.

Norman Eason's "Maintenance and Asset Management Information Systems"

This chapter looks at the way in which individuals and groups within an agency view the world—and how this impacts on the choice of system

Chapter 9

Culture

The transfer of an entirely new and quite different framework for thinking about, designing, and using information systems is immensely more difficult than transferring technology.

Although the previous chapter showed that **technology** is a major factor to consider in the selection and implementation of a maintenance or asset management system, it is by no means the most difficult factor. It does, however, tend to be the most visible area and it is undoubtedly the most exciting area. But it is really only an enabler to facilitate some of the more important aspects of the exercise that must be considered and resolved if the overall project is to become a success.

Undoubtedly, one of the most important areas that needs to be considered is the **culture** of the user organisation. This is perhaps best described by the German word *weltanschauung* which, when translated into English means **how you see the world**. All of us, singly and collectively, see the world in different ways. One of the biggest assumptions, and mistakes, made by many vendors (and consultants!) is the compartmentalisation of users into categories that

"Technology is transformed overnight; Mentality takes generations to alter."

Ricardo Semler
'Maverick'

are either traditional in their origin or are what the vendor or consultant would wish them to be! I will refer the reader to a quotation by Douglas Adams that I used at the beginning of Chapter 3: **Assumptions are the things that you don't know you're making**. Wrong categorisation of users and failure to take note of how they are constrained to operate or would like to operate is a major reason for failure of systems. Of course, you can try to indoctrinate users by training courses, seminars and workshops and no doubt these will often be successful, or **appear to be successful**. But we are talking about a fundamental change in the way that users are being asked to work. (If we are not doing this, are we just automating old procedures?) So if it isn't addressing the hearts and minds of the users, it isn't going to achieve what is expected of it. A collective term for the hearts and minds of the users is **culture**.

Sociological Aspects

We are all different and, despite whatever is stated in an organisation's corporate policy, **we all see the world differently**. We all have different skills, different upbringing, different education, different relationships and different aspirations. In fact, as I have said at numerous conferences, the major problems facing the implementation of maintenance and asset management systems are not **technological** but **sociological**.

So in what ways do we see the world differently? We must start by separating the collective from the individual. By collective I mean the user organisation and its collective sub-groups – its divisions and departments.

Separate cultures are fine, as long as the culture is correct and appropriate for the business.

The first and most obvious way that an organisation sees the world differently is by virtue of the **industry** to which it belongs. Clearly, a brewery will tend to see the world differently from a utility, even though some of their operations may well be similar. Ways of working, hours of working, attitudes to work and attitudes to the company will have evolved separately in these two types of organisations, with little or no communication between them. Their maintenance operations, although sharing a common description, will be operating on totally different types of equipment. Cleanliness may be a common factor for breweries and water utilities, but less important for electrical or gas utilities. Also, while all will be concerned with safety, there is no doubt that for electrical and gas utilities safety comes much higher on the list of priorities than cleanliness. It is only in the last two decades that maintenance operatives from one industry have communicated to any great length with those of a totally different industry. Attitudes such as 'It couldn't work that way in our industry' and 'Not invented here' have meant that industries still operate their maintenance in fundamentally different ways from other industries. Of course, there is now more sharing of ideas and a tendency to see each other's problems, but there are, and will be for the foreseeable future, separate cultures for each industry.

When you consider these different cultures in relation to the businesses that they are running, why should they not have separate cultures **as long as the culture is correct and appropriate for the business**? If the culture is detrimental to the business, then of course it should be reviewed and changed. Also, if the culture can benefit from the experience of other industries, then that too should be investigated.

Not all firms in the same industry will have the same culture

Industry Type

Now it would be wrong to rationalise that because culture is determined by the industry to which an organisation belongs, the converse is true and all organisations in the same industry have identical cultures. Both vendors and users often make this mistake. Vendors often believe that once they have sold a system to a user in a particular industry, further sales to users in the same industry will be relatively easy. Of course, a **reference** in the same industry is useful. It is, however, important to understand that the cultures of the two organisations may be widely different, albeit with industry common factors, because of the **other** cultural factors identified in the following paragraphs. For the same reason, the user's assumption that the system must work for them because it worked for another organisation in the same industry is likely to be invalid.

Attitude to Maintenance

In Chapter 2, we identified a fundamental cultural difference – whether or not an organisation had a **departmental maintenance** or an **asset management** strategy - that would cause an implementation of a system in an organisation to be considerably different from that in another organisation in the same industry. If such a cultural difference is understandable, then why do both users and vendors have problems with the existence of other cultural factors?

Competitive Strategy, Ethics and Personnel Policy

Consider the **competitive strategy** of the company. Surely this affects all aspects of the

company, if not directly, then certainly in an indirect manner? Would it not be likely that an organisation that is aggressively competitive would place different requirements on its maintenance or asset management information system, irrespective of whether it operated a departmental maintenance or an asset management policy?

It is a small step from **competitive policy** to considering the **ethics** of the organisation. Again, the requirements of the maintenance or asset management information system would be expected to be different as a result of the ethical policy; this time it will **certainly** permeate throughout the organisation!

The company **personnel policy** will also affect the procurement of the system, as it will determine how operatives, supervisors and managers are measured.

How often is the personnel policy of the user organisation considered by either the procuring team or the vendors?

Attitude towards Suppliers

How about the **attitude of the organisation towards its suppliers**? How is the supply chain working? Is it by threat, by least cost procurement, or is there a good partnership there, ensuring availability, quality and consistency of parts? How the company acts in this respect will determine what it wants from its maintenance or asset management information system.

Entrenched or Innovative

"Tell me how you measure and I'll tell you how I'll behave"

Dr. E. M. Goldratt
'The Goal'

"In re-engineering, re-design, or other change initiatives, the most critical factor for success is the quality of human interaction in the organisation."

Art Kleiner & George Roth How to Make Experience Your Company's Best Teacher 'Harvard Business Review on Knowledge Management'

Is the company **entrenched** or **innovative**? These are questions that it may be difficult for a vendor to ask directly, but they will affect the use of the system. I have no doubt that most vendors would have ways of finding out to which type an organisation conforms, provided they recognise it as a factor which differentiates the way an organisation is likely to implement and use a system. It is, however, another question for the user organisation to ask itself. Why allow yourself to be sold a progressive system if you know that there is absolutely no chance that your organisation will be able to make use of its facilities within the next decade?

Internal Attitude

The last factor that we shall consider in relation to the 'group' culture is the attitudes of the divisions and departments within the user organisation. It is unnecessary to inform the reader to what level of politics it is possible to descend in any organisation. (If the reader is in any doubt that there is a problem in this respect, I advise him or her to procure and read '*The Dilbert Principle*' by *Scott Adams*. After reading this, I am sure that he or she will be as well informed on the subject as the rest of us!) However you come to the knowledge of divisional and departmental politics, I am sure you will agree that the culture so formed does not only have attributes that are unique to each organisation, but is a given which is not easily changed!

Now we come to the second cultural area – that of the individual. It is not difficult to recognise that two separate groups of people, say of 100 in each group, even having similar skills, will be unlikely to

"Only if managers and employees see new ideas as being in their own best interest will they accept them gracefully."

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come up with identical solutions to problems. Nor are they likely to perform the same tasks in a similar manner or obtain identical results from the tasks. Here we have another assumption that is made by both vendors and user organisations. If there is this potential for difference in the ways that individuals relate to and use information systems, then **consider the effect that this difference will have on the ultimate success of the system**. I have seen more systems fail because of lack of attention to this problem than have failed for technological reasons.

The People Factor

People problems, people relationships, people aspirations and people personal agendas are seldom given the consideration appropriate to their importance in the successful implementation of a system. In fact, the problem needs to be stated more emphatically. **Most system implementations neglect the people factor and, as a result, most systems ultimately fail to achieve the objectives upon which their original funding was justified.** How can this be the case? Isn't training included in every system implementation so that all possible users know how to operate the system and enter and retrieve data and information relevant to their activities? Isn't this sufficient to ensure that users become involved and become a part of the system solution?

But these are all assumptions! The thinking is that if we follow the vendor's standard training procedures, then everyone will learn how to use the system and everything will have been done in this respect in order to achieve a successfully

WHY things are done is as important, if not more important, than HOW they are done. Training may need to include sessions on corporate objectives!

implemented system. This thinking normally covers the 'what' and 'how' to do things, but rarely covers the 'why' aspect. And it is the 'why' aspect that concerns most individual users, affects their daily work and affects their concerns about the future. The 'why' aspect will in part depend upon the group culture and in this respect may be addressed by extending the training activity to include sessions on the objectives of the organisation and where asset management, maintenance and the individuals concerned fit into this plan. However, the 'why' aspect has also to be looked at from the individual's viewpoint in order for the system to be able to achieve any measure of success.

Paternalism

Now here we have the possibility of tackling the problem in two different ways, depending upon the culture of the user organisation. If your organisation is in any way paternalistic and genuinely wishes to understand its employees, identify their hopes, worries and problems, then you would do all you can to find out how well the objectives of the individuals match the objectives of the system and the organisation. You would attempt to define the extent and variance of objectives amongst the relevant employees and the degree of difference between these objectives and those of the system. Then, hopefully, you would attempt to do something either about changing the manner of use of the system or managing the expectations of the users. Also, it would be hoped that this could be planned in early in the project.

"The successful company of the future must understand how people really work and how technology can help them work more effectively."

John Seely Brown Director, Xerox Palo Alto Research Center

"Intellectual assets, unlike physical assets, increase in value with use."

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Why would you be doing this exercise? Is it because you are a paternalistic organisation that considers the future wellbeing of your staff? Perhaps so, but I would suggest that there is another reason – that you have identified a possible divergence of requirements of the system, which could result in its ultimate failure.

Now suppose yours is not a paternalistic organisation. It is aggressive, competitive and, whether it thinks of its maintenance operation in terms of Asset Management or Departmental Maintenance, believes in dictating what and how tasks should be done and sometimes why (from the organisation's viewpoint) they should be done. Your policy is that staff are there to do the jobs which have been set for them and you will monitor how well they do the jobs and how long it takes to do them. The individual aspirations of the staff are of no concern to you; you have targets to meet and they are what matter most. Surely, however, if you do not attempt to understand the objectives of the individuals, the extent of these objectives and the degree to which they differ from the system objectives, you are missing out on important information which – even for a hard-headed organisation – could be critical for the ultimate success of the system. Given this awareness, there are two options; either the system can be adapted to **ensure** that users comply with the objectives of the system or workshops can be used to attempt to bring the two sets of objectives together. In the former case, this would require a rigid system which may be difficult to change (see the discussion on **Evolution** in Chapter 10), which is unlikely to encourage improvement suggestions from the workforce, and which would perpetuate the 'us and them' scenario. The second case would, however,

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Art Kleiner & George RothHow to Make Experience Your Company's Best Teacher 'Harvard Business Review on Knowledge

enable a progressive and positive approach to the use of the system and, hopefully, the elimination of the divergence of objectives. It would, in addition, increase knowledge and awareness at all levels of the organisation.

A considerable amount of emphasis has been spent on the subject of culture. It is most important, it is most often neglected, but it is a crucial factor for the success or failure, not only of new activities but, as we shall see in the next chapter, of on-going activities.

See over page for Key Points

Key Points in Chapter 9

- The transfer of an entirely new and quite different framework for thinking about, designing, and using information systems is immensely more difficult than transferring technology.
- How one person sees the world may be vastly different from the way another person sees the world.
- A common mistake is to compartmentalise users into categories that are either traditional or what one wishes to see.
- Wrong categorisation of users and failure to take note of how they are constrained to operate or would like to operate is a major reason for failure of systems.
- If an information system isn't addressing the hearts and minds of the users, it isn't going to achieve what is expected of it.
- The major problems facing the implementation of maintenance and asset management systems are not **technological** but **sociological**.
- Cultures have always been industry-specific. This will continue to be the case for the foreseeable future.
- Organisations in the same industry do not necessarily have the same cultures.
- User organisations with a **departmental maintenance** policy will have a different set of requirements from those with an **asset management** policy, even if they are in the same industry.
- The **competitive strategy** of the user organisation is a differentiating factor.
- The **ethics** of a user organisation is a differentiating factor.
- 'Tell me how you measure and I'll tell you how I'll behave'. The **personnel policy** is a differentiating factor.
- An **innovative** organisation will have different requirements from those of an **entrenched** organisation.
- The degree and nature of **politics** in an organisation is a differentiating factor.
- Only if managers and employees see new ideas as being in their own best interest will they accept them gracefully.
- Most system implementations neglect the **people factor** and, as a result, most systems ultimately fail to achieve the objectives upon which their original funding was justified.
- The 'why' aspect of the implementation of the system has to be looked at from the individual's viewpoint in order for the system to be able to achieve any measure of success.
- The successful company of the future must understand how people really work and how technology can help them work more effectively.
- Intellectual assets, unlike physical assets, increase in value with use.
- 'Hard' results, such as financial returns or technical objectives, are frequently a function of 'soft' issues, such as a company's culture.