"That's not very big, is it?"
Skills Based Quality Systems

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Introduction

The aim of this series of (three) papers is to describe an approach to the construction of an effective and manageable quality management system (QMS) based on the development and recording of the skill base of a professional service provision organization.

♦ Effective, in this context, means that it will provide the information necessary for the maintenance and improvement of service quality.

♦ Manageable means, quite simply, *small*.

The philosophy underlying the approach stems from the definition of *professional* given below, and the fundamental belief that the complexities of service provision and the improvement of its quality cannot be modelled in a *once and for all* manner. Therefore the traditional, documented procedure, approach to quality management is pre-destined to failure in the service sector.

In order to be effective, any system designed to maintain professional service quality must address not only the nature of professionalism, but must use this nature to provide robustness in practice and embed it in a structure both sensitive and intelligent enough to *learn*.

In addition it must be small enough to be willingly used, and transparent enough to be understood (at least in principle), by those who use it and manage it.

Such a system necessarily involves the planning, intelligence gathering, human resources and the operational levels of the organization in an integrated whole.

Although this paper concentrates on the development and structure of the skills base, developing the rationale and providing detail, it also includes, for contextual purposes, an overview of the model as a whole (which will be developed in detail in the third and final paper). The subject of the second paper will be the role of senior management and the relevance and importance of strategic planning and the HR function to the ongoing delivery of quality.

In what follows some level of utilization of information technology (IT) is assumed in the operation of the system described. However this is an operational convenience rather than a necessity — the concepts are "media independent".

The Service Quality Problem

In a manner which parallels past experience in manufacturing, recent years have brought about an increasing pressure on the service sector to address issues of provision quality. However this drive to improve quality, which has never been very successful in the manufacturing sector, seems to have been even less so in the provision of services. There are two basic reasons for this:

♦ **The definition of "quality".** Quality has been described in the literature (see Beckford, 1998 for a review) as conformance to specification or fitness for (some assumedly pre-specified) purpose. Because of this, quality is often equated with standardization. Hence the level of quality is perceived as the inverse measure of deviation from a specification, rather than the warm rosy glow of the experience of a *good thing*.

♦ **The fact that *services are different*.** There is often no tangible product as the result of a service. Service, and therefore service *quality*, is an emergent property of the process of its provision.

The interaction of these points has perhaps driven the proliferation of paper based "quality systems" for the control of service quality which are unusable. The attempt to capture the richness of service provision in flow-chart format makes them so large and complex as to be unintelligible. The fact is that no self-consistent system *can* completely capture all such complexity (see Gödel's incompleteness theorems, see Wang, 1996 for a detailed exposition), and so they are incapable of

achieving the purpose for which they were designed. Thus such quality management systems are, by their own accepted definition poor quality.

What is needed is a re-conceptualization of quality and quality management appropriate to the professional service sector.

The Overall Structure

The skills based model is contained within a wider model of the operation of an organization.   The diagram (below) illustrates that part of organizational operation that relates directly to quality.
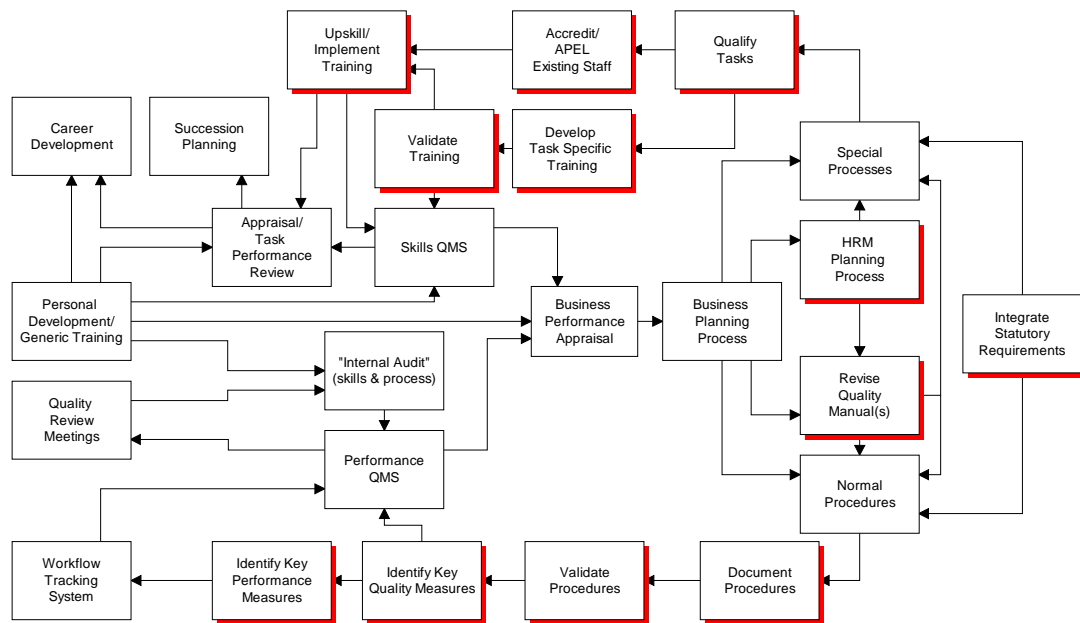

Figure 1, The quality process

The process of quality provision is the result of a set of highly interconnected sub-processes some, e.g., career development, are subsidiary in this discussion. Others, e.g. business performance appraisal and business planning, are central but beyond the scope of this paper (they *are* the subject of paper two).

It should also be noted that although the intention is to show a skills based QMS this does not preclude the possibility of the existence of processes that are susceptible to traditional performance monitoring and control methods (in fact the model is made more robust by their presence). This element of the model is represented by the flows in the lower half of the diagram.

When the links to the environment available through the business planning process are activated the whole model represented by the

diagram provides the ability for the organization to learn from its experience, changing its behaviours and its value sets over time in relation to environmental and internal needs.

The diagram is a simplification of a highly complex process containing many circular and self-referential sub-processes. But neither the organization nor its managers are well served by pretending that this is not the case. Fortunately it is only the processes presented in the upper half of the diagram that are of relevance to the discussion in *this* paper.

The Notion of Skills Based Quality

> *profession* (noun)
> > *a vocation or calling, especially one that involves some branch of advanced learning or science.*
> > Concise Oxford Dictionary

The idea of using skills to assure quality is not new (consider the medieval craft guilds), even amongst the quality community. There is a section in the ISO 9000 family of standards which relates to what it calls "special processes" (see Hoyle, 1994), processes where the quality of the output is not susceptible to assurance through normal methods of inspection. The distinguishing factor of our approach is the embedding of this idea into an integrated model.

The quality of the outputs of special processes is assured in our model through the determination of the abilities and competence needed to carry them out, a process known as "qualification". Once a process is "qualified" formal quality assurance is achieved by ensuring that only those operators whose skills match those needed for the special process are permitted to work on it. This of course, though embryonic and static, is a skills based QMS.

The more recent "Revision 2000" re-statement of ISO 9000 (BSI, 1998), which places more emphasis on process control approaches and the Investors in People (IIP) type standards which emphasize organizational development, represent early steps along this path (although they have yet to actualize the theory outlined in this paper). Because of this, formal recognition of the skills based approach (and consequently manageable QMS's in the service sector) has become a more realistic ambition.

The attraction of process control is based on the premise that the better you control the process the less error, and the less error the higher the quality. As service *is* a process, the less error in the process the higher the provision of service quality. How can this be achieved?

All services are "special processes" in the sense of ISO 9000. Fundamental process control can be achieved by recognizing and treating them as such.

Services are delivered *by people*. Therefore process control in the context of service provision is the control of the behaviour of the people providing the service. How? Assuming (as a minimum) the absence of malice, appropriate behaviour (i.e. behaviour which is likely to achieve the purpose of the service being provided in the first place) is assured by ensuring that the provider of the service has the skills, knowledge and competence deemed to be necessary to the provision of the service.

Services are also delivered *to people*. People (especially clients, patients, passengers, customers) vary, therefore no two service provision events are ever the same. Even assuming (the impossible situation) that the education of the service provider ensures that they are consistent in approach there will be as many variations on a single service as there are recipients (victims?), this is why the complexities of service provision arise.

It is the potential variety of the situations that arise in service provision which, of necessity, defeat the engineering approach to quality management. It is not possible to model all possible situations in advance, therefore it is not possible to specify all activities and solutions in advance, therefore it is not possible to chart the process fully in advance — not even with charts a mile long — and it is the very attempt that creates the bureaucracy.

This impossibility is a consequence of Gödelian theory and an extension of the "Law of Requisite Variety" (Ashby, 1956) which states that only variety can overcome variety. In other words, a complex situation becomes uncontrollable when it becomes *more complex than the mechanism used to control it.* Hence robustness in the delivery of service quality (i.e. the control of the service process) cannot be achieved using mechanistic approaches as the machines (real or otherwise) we are able to

design are necessarily less complex that the situations they are designed to control (i.e. other people).

In contrast to machines, people are extremely good at dealing with complexity. And this ability to deal with complex situations and make sensible decisions in the absence of complete data only becomes more prominent when the people involved have become skilled, educated or trained for, or in, the task at hand.

Utilizing this human ability to deal with complexity has two distinct advantages over the traditional 'chart, measure and count' approach in the assurance of quality in service provision.

The first is that it significantly reduces the amount of paper necessary to the operation of the system. Quality relevant procedures can be stated in a descriptive form, i.e.:
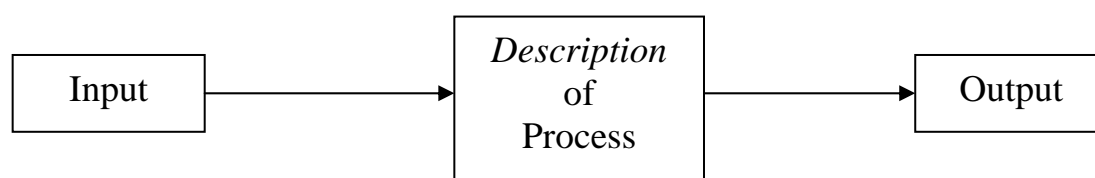
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┌──────────┐        ┌──────────────┐        ┌──────────┐
│          │        │ Description  │        │          │
│  Input   │───────▶│     of       │───────▶│  Output  │
│          │        │   Process    │        │          │
└──────────┘        └──────────────┘        └──────────┘
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Figure 2

The ideal situation in this model is:

♦ **Input:** Client with problem

♦ **Process:** Negotiate solution to problem

♦ **Output:** Client without problem

And whilst it must be accepted that this ideal will be difficult, if not impossible to achieve in many or all cases, complicating the documentation of the process to be undertaken will not make it any less difficult. Indeed the production of rigid procedure charts (which as we have argued cannot capture the entirety of any situation) may give a false impression of the operation of the process, and may very well remove the things that would allow a solution to be reached — negotiation, informed choice and compromise — creating a "Jobsworth" mentality.

The second advantage to be gained is co-determinant of the first. By ensuring that individual service providers have the skills necessary to carry out the tasks they have been set it is possible to devolve responsibility.
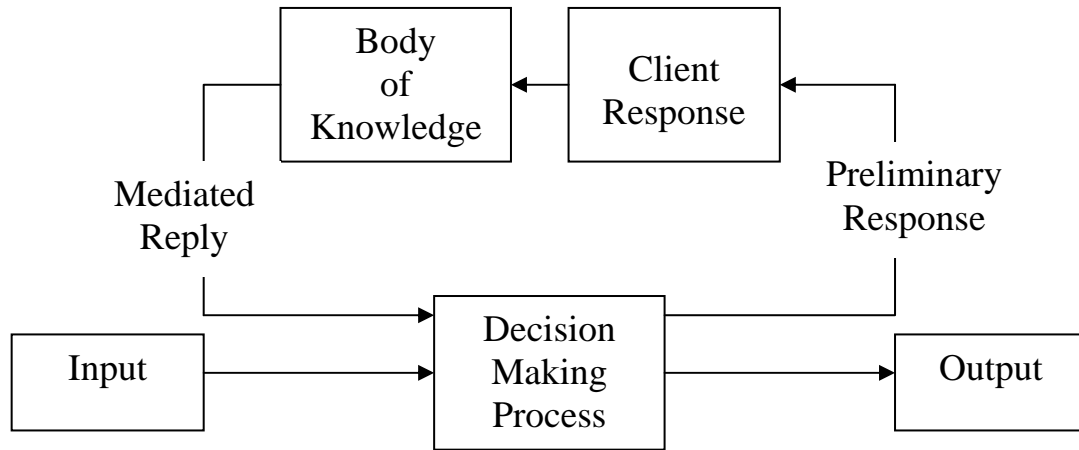
Because professionals draw on a shared body of core knowledge (see fig. 3) in their decision making processes it is possible to predict (in the absence of malice and within certain constraints) the range of solutions professionally available to the front line providers with a degree of accuracy. This standardizes the outcomes at the level of 'client perceived quality' without the necessity of standardizing the potential solutions available to non-standard clients.

The *professionalism* implicit in this model allows the quality of the outputs of the organization to be 'process controlled' rather than 'post delivery inspected' (see fig 4), which can only ever be *complaint management* and is meaningless in the service context.
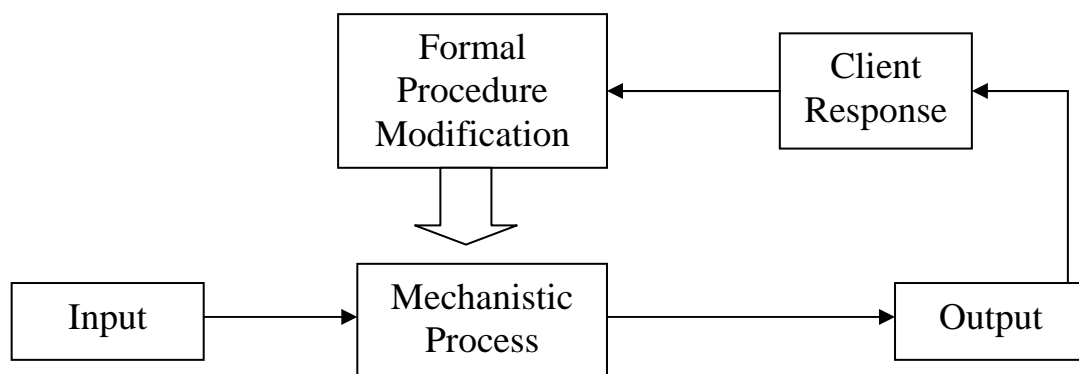
This is because the evaluation of the service provided using a mechanistic process is possible only *after the event*, rather than as an integral part of it.

Thus by defining the skills necessary to the fulfilment of the task:

♦ the complexity of the system necessary for its control is also reduced, process definition is transformed into a statement of professional competence (less paper)

♦ the level of managerial and supervisory intervention is reduced, tasks become owned by the provider (less overhead cost)

♦ the level of perceived autonomy at the individual level is increased and greater personal responsibility is taken for the delivery of quality (lower alienation from task)

♦ the process becomes more flexible, the potential for client perception of quality is increased (fewer complaints).

The Model for a Skills Based QMS
In pure form (although this will rarely be the case) the creation of a skills based QMS is very simple:

♦ Identify the tasks to be undertaken

♦ Identify the skills necessary to undertake the tasks

♦ Ensure that only those people that have these skills undertake the task.

In practice however, each of the three stages will contain sub-tasks and require ongoing operational validation.

Task Identification
Identification of the tasks to be undertaken is, effectively, a *key process* analysis, determination of those transformations that are vital to service provision. Outcomes of this stage of the approach should be:

♦ identified key tasks

♦ identification of those tasks that can be reduced to linear processes

♦ statement and general description of those tasks not susceptible to linear representation

♦ identification of those tasks which, whilst not susceptible to linear representation are *routine* or repetitive and thus susceptible to standard performance measures.

The selection of key tasks tends to be a negotiation process between the QM designers and the client. It is advantageous to keep an open mind regarding the perception of what is and is not key, decisions made at this stage can return to haunt the intervention later on.

Selection of the processes for inclusion on the skills based side of the design process is based on a heuristic relating to the complexity of the charting necessary to render the process. If it is possible to achieve *significant* complexity reduction through the acceptance of some minimal level of skill on the part of the operator it can be assumed that there are also significant operational efficiency gains to be made by using a skills based approach to the quality assurance of the process (see figs. 2 and 3).

The demands of the quality management model presented in figure one are satisfied by the outcomes of this stage of the approach through the production of:

♦ documentation of those processes that can be represented as linear flows, including control points and performance measures (fig. 5)

♦ generic *description* of those processes that cannot be represented as linear flows but are "routine", including control points and performance measures (fig. 6)

♦ a *statement* of those processes that cannot be represented as linear flows and are "non-routine".

Identify the Skills
With the operational elements of the model defined (in the case of the linear processes) or described (in the case of non-linear processes), and performance measures stated it is possible to move onto skills definition.
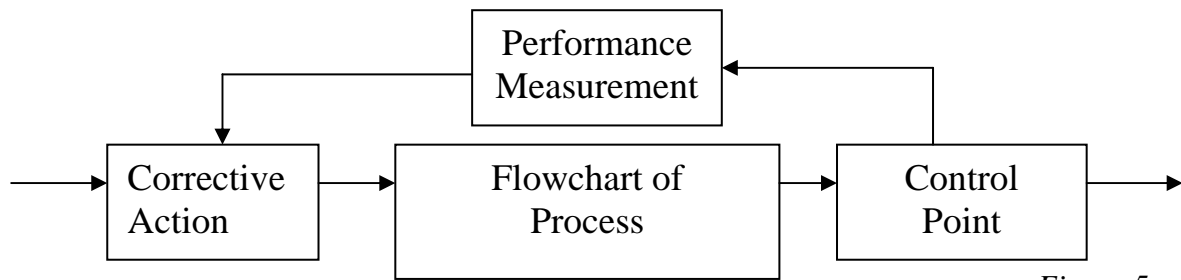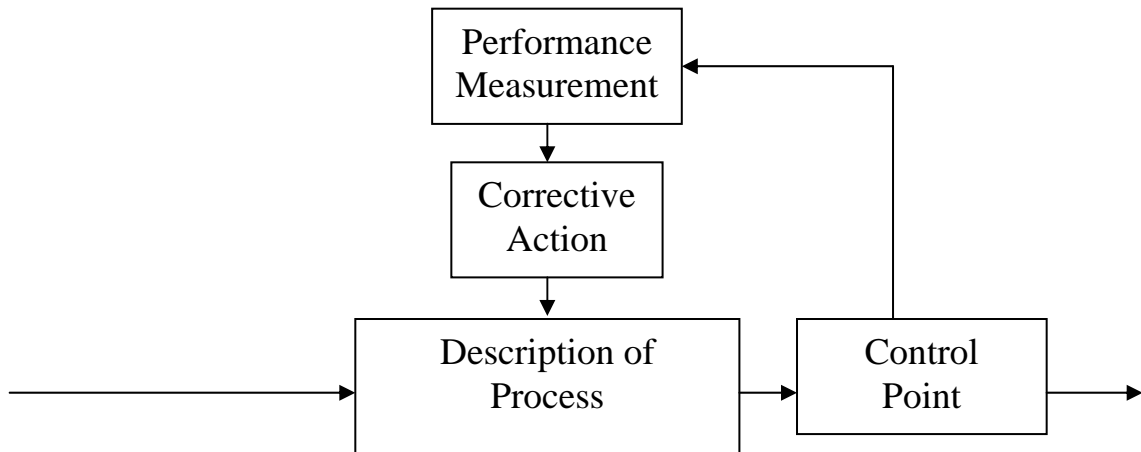
Figure 5

Figure 6

It should be noted that there are two assumptions in figures five and six — that the processes themselves are fixed, for the most part linear processes are *input controlled* and routine skills based processes are *activity controlled*[1]. The embedding of organizational learning is treated in some detail in the second and third papers in the series, here we deal only with the skills selection process.

The skills used in an organization are categorized by us into three types:

♦ generic

♦ role specific

♦ professional

Each of the skill types, and their level of development and importance to the operation of the organization, have an impact on the type of QMS

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[1] note that the corrective action shown in figure six is *behavioural modification*, i.e. relating to the performance of an individual, as this is not, strictly speaking, an input in our terminology it is shown as a process modification.

appropriate and the potential success of the skills based approach. This categorization, shown in figure seven, indicates what we believe to be a model of the inter-relationships between the varying skills available in a service organization. It also provides a basis for deciding the extent to which a planned education and development programme (possibly within existing structures) can be used to enhance performance and, therefore, the type of QMS appropriate to support it.

Generic	Role	Professional
MBA	Specific Masters & Research Programmes	Memberships & Professional Recognition
NVQ Level 5	Knowledge Based QM	
4	Skills Based Quality Management System	Product Assurance and Development
3	Procedure Based QM	

Records

Feeds   Feeds

Figure 7

In practice, the effective professional service organization will rely on a balanced utilization of all three skill types. Each sharing the common characteristic that, as the operations of the organization move toward a dependence on skills typical of the upper half of the diagram, it will become increasingly difficult to control quality using the more traditional charting approach.

A quality management system which aims to support the improvement of the performance of the organization will, of necessity, focus on *role*

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performance. Hence the skills baseline in any organization (not shown in fig. seven) is that minimal ability needed to follow the linear process charts.

However as the organization moves away from the baseline, to the "non-linear but routine" tasks, the skill necessary to absorb the complexity generated moves onto the lower end, and to the left, of the scale.   Such skill levels are consistent with the ability to operate competently *within* the established processes. This competence within processes is reflected throughout the left of the diagram. As the operator becomes more skilled/senior the imperative changes from the achievement of objectives to the *setting* of these objectives.

Tasks in this category are typified by such roles as tele-sales or help-desk operation. They are susceptible to performance measures such as "How many?", "How often?", How long?" or "How accurate?". The human operators are trained to deal with the procedural aspects of the task and some limited discretion to deal with "non-standard" occurrences. As the individual moves up this scale s/he contributes to the organization through their management or administrative skills.

To the right of the scale the emphasis is very different, it is on the consideration of *what the processes can or should be*.   Professional knowledge brings with it the capacity for critical reasoning around the structures through which the service is provided, and forms the basis of the non-linear, non-routine skill set.   At this end of the scale the imperative is not "What are the objectives?", but "What are suitable indicators to measure the objectives by?".

It is not possible to set commercial *performance* indicators for professional skills, as the focus of these skills is based on the integrity of the professional discipline. The professional contributes to performance through the appropriate application (and in some cases extension) of the body of professional knowledge to the furtherance of organizational objectives. To a large extent the only performance indicator applicable to the professional is the performance of the core product in the market.

Choice of skill type (i.e. generic, role specific, professional) should be based on the contribution to the process and will provide (in conjunction with the appraisal process and personal career ambitions) indicators as to the appropriate development strategy for individual role incumbents.

At this point it should be possible to assign "qualifications" or skills lists to the roles identified. The lists should also identify those qualifications where possession is a legal requirement.

Ensuring the Skills-to-Task Link
Ensuring the skills-to-task link has two main elements:

♦ skills assessment

♦ records management

The skills possessed assessment section of the link comprises the appraisal process of the organization and is dealt with in detail in the next paper.

Operational service quality can then be assured through the creation of an auditable documentation system which demonstrates that the skill sets of operators meet or exceed the skill set stated as necessary to carry out their task.

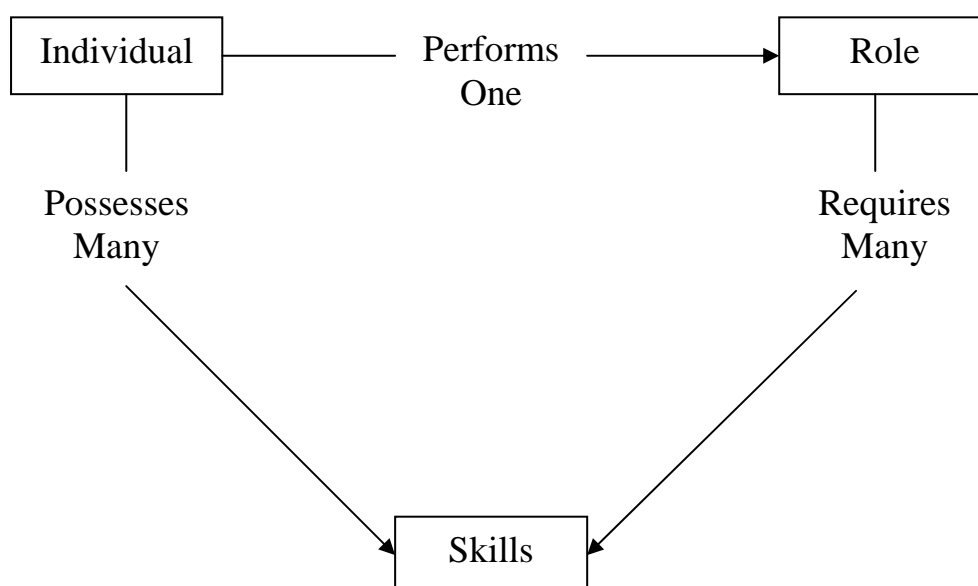Documentation of the skill base is best handled in a relational model as given in figure eight.

Figure 8

The notion the diagram is intended to represent is that organizations (in relation to their stated working arrangements) possess a body of skills held by their personnel (and which is identifiable and verifiable through the appraisal process) and a set of skills needed identified through role analysis.

It is relatively simple to construct a relational database to carry out this task and to extend its utility to the creation of personal development plans, pre-selection for internal promotions and the generation of job specifications for recruitment purposes. The assumption of a one-to-one relationship between individuals and roles is a simplifying device allowing the creation of strong (i.e. normalized) relationships in the database. It can be overcome for people in multiple roles using a concatenation of the search strings and query conditions.

At its most simple the database need comprise no more than two tables, each containing a set of triples,

Table 1, "Staff Skills"

Staff Member	Skill Identifier	Level Possessed

Tables 2, "Role Skills"

Role Identifier	Skill Identifier	Level Required

with a formal relationship between the "Skill Identifier" in each table. It is then possible to use the query language to interrogate the database for:

evidence of compliance to procedure, e.g.
        "Level Possessed" < "Level Required" = {0}

creation of personal development plans, e.g.
        "Level Possessed" < "Level Required" >= {0}

pre-selection
        "Level Possessed" = "Level Required"

job specification
        = "Level Required"

The outcome of this stage of the approach is a prototype version of the database.   At its most basic the functionality should support the identification of the skills necessary to a particular role, the skills possessed by individuals in the organization and, through the query system be able provide evidence that *only* appropriately qualified individuals carry out or are responsible particular tasks.

Finally, a word of warning in relation to the database. If the development work in the previous stages has been carried out thoroughly it will have been a highly iterative process, this stage will also have its iterations and refinements. However in most cases this is the first stage where there will be "something to touch" and, therefore, something to complain about. The revisions necessary here are likely to be out of all proportion to their importance in the project.

In Summary
This paper has provided a high level description of a skills based QMS. It has also identified those areas where the approach cannot "stand-alone" if it is to be effective. Some of those areas, for example the role of senior management and, in particular that of the HR planning process, and the necessity of the integration of the model are dealt with in later papers. Others, for example the relative advantages of linear process documentation and control are not. However, as the more traditional approaches are not core to this paper, and have been treated extensively in the literature, this is not thought to be a major problem.

Readers with questions of detail regarding this section of the approach and its application are invited to contact the authors:

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