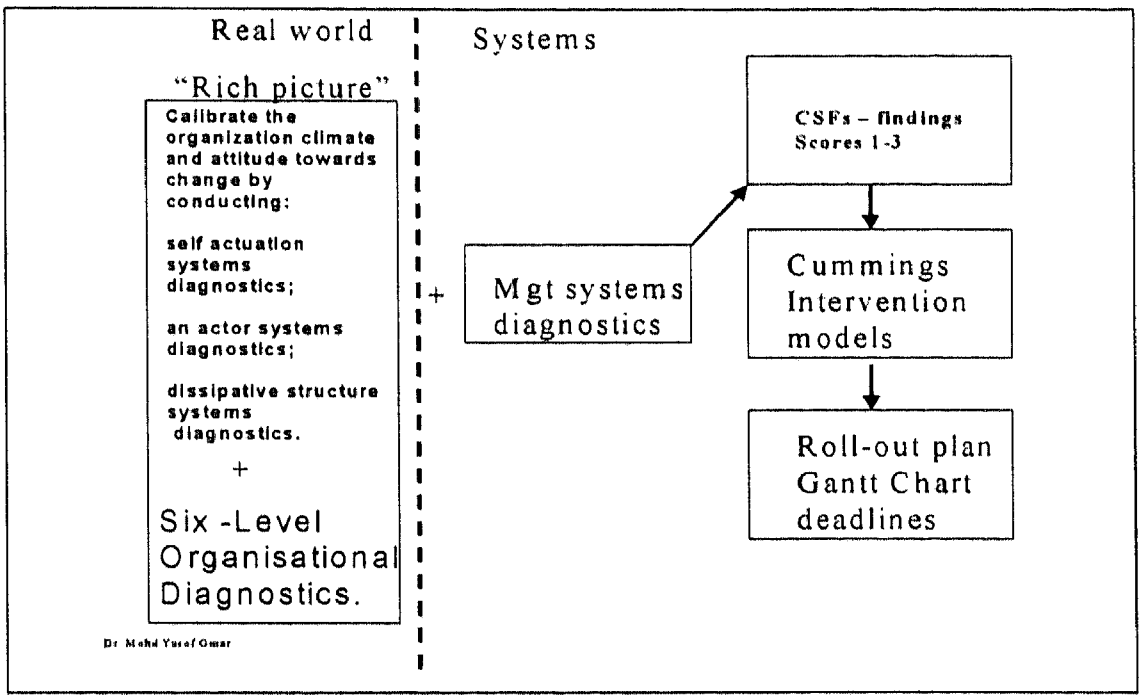
## CHAPTER 2. LITERATURE REVIEW

### 2.1 Overview

The schema below presents the Mohd.Yusof Omar model on which this paper is based:

**Exhibit 1: Mohd. Yusof Omar's Organisational Diagnostics and Planned Change Model**




In the model used, the Mohd. Yusof Omar approach[19,20], taken in completing the SSM diagnostics applies the concepts and theories of Self Actuation Systems, Actor Systems, the Dissipative Structure System and the Cummings Model of Organisational Diagnostics and Intervention. The Management Systems Diagnostics will be based on the requirements of the ISO2000 model of a Quality System.

Action research and participant observation techniques were used to gather data and observations.

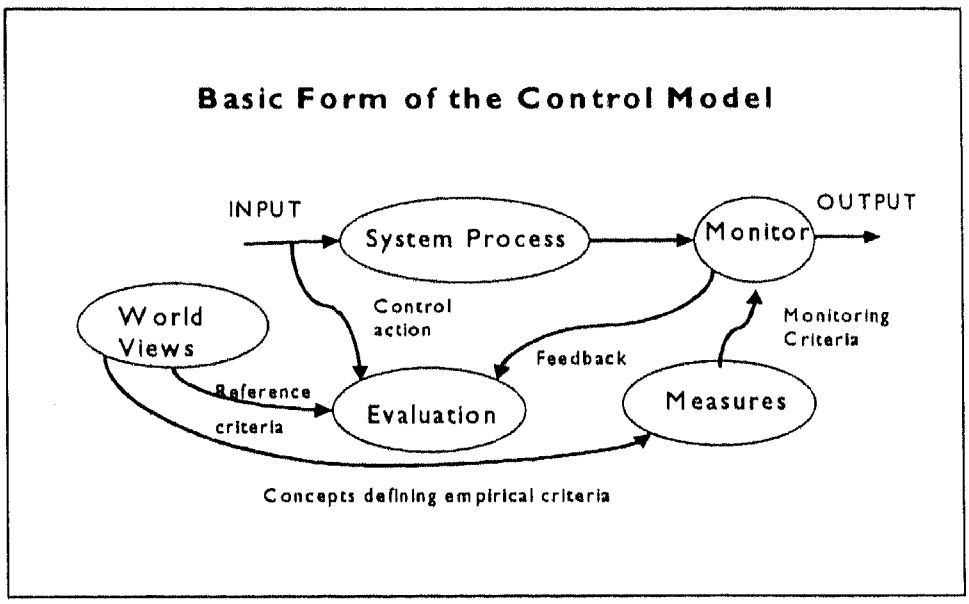
The following discussion will outline the concepts and approach taken and provide further insights on the logical framework of the project.

## 2.2. Self Actuation Systems

Self actuation has to do with viable systems and their need for closure, and homeostasis. Homeostasis is normally represented as a control loop and involves a process with input and output flows, an output monitor, a set of measures that relate to behavioural performance, a comparator against which standards, norms or goals can be compared, and an actuator that can take action to regulate the process. The monitor, comparator and actuator are active organisational processes that occur within transmorgrification, (Yolles, 1999)[30]. The standard or norms and concepts that result in measures of behavioural performance are paradigm dependent, and linked to the world-view of the actors.

The diagram below presents this relationship in a graphical manner.

**Exhibit 2: Graphic Representation of the Control Model (Yolles, 1999)[30]**



Comparing this against Argyris, single loop, double loop learning, it is then clear that with self actuating systems, the monitor, evaluation, and measurement functions fall within the scope of the double loop learning experience. In adaptive systems, Yolles further adds the influence of the comparator and learning activator in the learning process.

Yolles[30] presented the characteristics of actuation that define the possibilities of viable system closure are as follows:

| | |
|---|---|
| Self –influencing: | Circular causality and causal loops that affect patterns of causation, |
| Self-regulating: | Maintenance of a particular variable –so as to keep essential variables within definable limits. Relies on negative feedback and specified limits. |
| Self –organising: | Self-amplifications of fluctuations generated in the system as a result of perturbations from the environment. |
| Self-sustaining: | Self-sustaining operations are organisationally closed – when all possible states of activity always lead to further activity within itself. Such a closed process is self-sustaining. |
| Self-producing: | Autopoietic systems self-produce both their components and their boundary |
| Self-referential: | Symbolic reference to the self. These systems refer to themselves in terms of themselves or their components through image, expressed symbolically. |
| Self-conscious: | Able to interact with descriptions of the self. |

These characteristics will later be used as a measurement tool in the assessment of the organisation under study.

## 2.3. Actor Systems

Shakespeare defined it well when he said *" All the world's a stage, and all men are actors"*. Actor systems are complex, adaptive and implicitly viable systems. Such systems may be individuals or social entities, the essential aspect being that they do things, they act and carry out a chain of competencies that are a function of the system or subsystem from which they originate.

In the dynamics of actor systems or networks[27],(Stalder, 1977), three phases can be distinguished. Although these phases may not be very distinct and may merge into each other, it is possible to typify them as follows:

### 2.3.1 Emergence

Networks are put into place by actors. Since every actor has a network, new networks emerge out of already existing ones. Sometimes this happens through subtle changes, sometime as the results of revolutionary developments.

### 2.3.2 Development

A system can develop in two different directions, towards convergence or towards divergence of its actors. Adding new actors to a system at first increases their divergence. The processes of translation by which the will of one actor is transferred to another actor become initially more difficult because each new actor is already included in other networks that might have aligned him/her/it for different goals.

### 2.3.3 Stabilization

Systems that are not able to stabilize themselves to a certain degree disappear from the scene, while those which were able to achieve a certain convergence proliferate and become the necessary starting point for any new network.

An actor system thrives for stabilization because none of the entities which make it up would exist without that system in that form. It is in the interest of all actors within a particular system to stabilize the system which guarantees their own survival to a higher or lower extent. The prominence and the potential of an actor is defined by he/her/its position within the network and by the size and degree of convergence of the network.

### 2.3.4 Black Box[27]

The concept of black box in actor systems was elaborated on by Stalder, (1977), based on the earlier work of Callon and Latour as follows:

> *"A black box contains that which no longer needs to be considered, those things whose contents have become a matter of indifference.*

A black box is any setting that, whatever its history or complexity, is now so stable and certain that it can be treated as a fact where only the input and output counts. The term itself is derived from cybernetics, where it signifies a piece of machinery or a set of commands that might be very complex but can be substituted by a box because it is regular and stable. The law, for example, is a collection of black boxes

Black boxes can take on different forms, they can be artifacts, facts, norms, traditions, or structures. They allow the reduction of the complexity of socio-technological reality, in everyday life as well as in social theory. We have come to accept certain elements as part of life, as for example, we do not need to know the personality of the clerk at the cash register in order to trust him or her to hand over the money to pay for our shopping. Whole sets of black boxes can be integrated purely on the level of their in- and out-put because they remain stable. This certainty of action translates to greater stability when dealing with black boxes within an actor system.

## 2.4. Dissipative Structures and Complex Systems

Yolles (1999), built his theory of dissipative structures on the work of Prigogine & Stengers,1985. Dissipative structures are complex systems which are open systems exchanging energy, matter or information with their environment. All systems contain sub-systems which are continually "fluctuating". When one or more fluctuations become so powerful, as a result of positive feedback, that they shatter the pre-existing organisation, the system has been forced into a *far-from-equilibrium* condition and has reached a point of bifurcation. It is inherently impossible to determine in advance which direction change will take.

Dissipative structures are defined as :

- Having dissipative structures
- Are globally far from equilibrium
- Are inherently dynamically unstable,
- Use energy to maintain order through negentropy beyond any thresholds of instability.

In terms of the flow of information, a stable system can be sustained with a sluggish flow, but a much more vigorous and richer flow is necessary for a system operating far-from-equilibrium. If the flow of information becomes too fast, however, then the system may disintegrate.

When far-from-equilibrium, systems are forced to experiment and explore their space of possibilities and this exploration helps them discover and create new patterns of relationships and different structures. (Mitleton-Kelly, 1997)[18].

Mitleton-Kelly (1997) in her paper on "*Organisations as Co-evolving Complex Adaptive Systems*" discusses how this characteristic may also be

applied to individuals and to social systems. When an individual or an organisation is pushed either by circumstances or deliberate intervention away from an established pattern of behaviour, or when constraints are encountered in reaching a desired goal, then humans are forced to experiment, to explore their space of possibilities and to find alternative ways of attaining a goal or changing the goal altogether. They find new patterns of relationships, different structures and innovative ways of working. Yet the idea that working away from equilibrium is desirable, is quite strange, if not revolutionary.

We need to affirm the principle that a system working away from equilibrium will thrive and will be more innovative. But this is only one aspect of the argument. We need to note also that if a system is pushed too far away from a stable state, it will dissolve into instability (Mitleton-Kelly, 1997).

### 2.4.1. Edge of Chaos Paradox

The notions of stability and instability provide another way of looking at complexity. When a system moves from a state of order towards increasing disorder, it goes through a transition phase called the edge of chaos. In that transition phase new patterns of order emerge among the disorder and this gives rise to the paradox of order co-existing with disorder. Complexity in this view is seen in terms of the order which emerges from disorder.

All three, are valid ways of thinking about complexity, that is in terms of *interconnectivity, as dissipative structures* and as the *edge of chaos paradox.*

### 2.4.2. Emergence, Self-Organisation

The term *fitness landscape* is used in evolutionary biology to illustrate the competition for survival. Species who fail to adjust, and move to higher points on their landscapes, may be outpaced by competitors who are more successful in doing so, and thus, risk becoming extinct through a process of natural selection

A fitness landscape may also be used by companies to assess their 'fitness' within a competitive ecosystem. By changing different parameters, an organisation may take 'adaptive walks' within its industry 'landscape' – this would demonstrate the existing position as well as opening up other possibilities which would improve its 'fitness' or competitive position. A fitness landscape would also demonstrate how each adaptive move affects the position of all other related businesses, how it 'deforms' the 'landscapes' of neighbours and would illustrate the concept of co-evolution.

In a co-evolving ecosystem, each organisation *is a fully participating agent which both influences and is influenced by*, the social ecosystem made up of all related businesses, consumers and legislative bodies.

Strategies consequently, need not be seen simply as a *response to* a changing environment which is separate from the organisation, but as adaptive moves which will affect both the initiator of the action and all others influenced by it. Change therefore, may be seen in terms of adaptive evolution. However adapting entities confront *conflicting constraints* both in their internal organization and in their interactions with their environments, and finding the 'optimal solution' is very difficult. But it also means that there may exist many alternative locally optimal compromise solutions.

### 2.4.3. Feedback And Positive Returns

Feedback systems can be affected in one of two ways, depending on the type of feedback. Feedback can be either negative or positive. Negative feedback reduces or cancels out deviation, positive feedback amplifies it.

Planning systems tend to work on the assumption of negative feedback. Monitoring systems are set up to detect deviations from the planned outcome. Whenever there is a deviation from the specified objective, action is taken to bring the deviation under control, by attempting to reduce the gap between

intended and actual outcome. Unfortunately for planners, social systems cannot always be controlled through negative feedback as they are also subject to positive feedback, which can take the form of "self-reinforcing growth, bandwagon effects, chain reactions, self-fulfilling prophecies, and virtuous and vicious circles".

If positive feedback does set in, then the gap will widen instead of narrowing, and there is no way of knowing in advance which feedback mechanism will apply.

An example of positive feedback is the increasing lack of confidence in a company that is believed to be in eminent collapse. The Board sees that demand for the product is declining and tries to improve the company's image and performance in the market place, through a series of internal re-organisations. But this mechanism has the opposite effect to that desired. It is so disruptive that good staff leave. This affects the relationships with clients, who no longer have contact with, and the advice of, knowledgeable representatives. In high-technology companies these relationships and the sense of confidence they engender is critical. A buyer will not commit company funds to a product which will not have technical support during its lifetime. As lack of confidence increases, sales of the product are adversely affected and a vicious circle of positive feedback sets in.

It is valid to note however that the state of *bounded instability*, is qualitatively different from either a state of stability or one of instability. A complex, dynamic system can exist in three different states. Two of those states are contradictory: one is a state of stability and the other is a state of instability. But in the *transition phase* between the two extremes, there is a third state of *bounded instability.* That third state, *the edge of chaos*, can accommodate both stability and instability, certainty and uncertainty, order and disorder *at the same time*.

## 2.5 The Conceptual Links

Maurice Yolles integrates these different lines of thought into a viable systems approach[19]. He affirms that complexity theory is built on chaos theory which is itself built on the theory of dissipative systems. All these theories are built on the foundation premise that viable systems are usually dynamic and frequently far from equilibrium. They change and still survive because they are able to maintain their stability, even though they may shift between robustness and structurally critical conditions from time to time. Based on this conclusions, Yolles, (1999)[30], makes the following propositions.

a) A system is a unity of actors, or entities, each with its own frame of reference. Each actor or entity may be composed of sub-systems that may themselves be seen as actors.

b) A viable social system is a self-organising group of individuals who maintain and share at least one paradigm or view of the world.

c) The paradigm with its logical organising relationships and manifest consequences (like rituals and methods) represent the image of the social system.

d) The paradigms of a social system determine their network of beliefs, and will determine how the system will function.

e) Viable social systems have operational closure through self-organisation, self production or autopoiesis, self-reference and autogenesis.

f) A viable social system has self-organisation if it has the ability to amplify unexpected fluctuations that occur within it. Fluctuations occur as a direct result of perturbations from its environment that affect its dynamic events.

g) A viable system may exist as a holon made up of networks of other holons in a system hierarchy (or holarchy), each a semi-autonomous cooperating entity. Such systems may adapt.

h) A viable is able to support adaptability and change while maintaining operational (behavioural stability). It is a complex adaptive system when it maintains complicated networks of independent components that are so interconnected a to form a unity or organic whole with demonstrated capabilities to adjust behaviour to changing circumstances and to anticipate future events.

i) Autopoiesis is the self-production of individual and collective physical and psychic behaviour that derives form its organisational networks. An autopoietic

system defines its own boundaries relative to its environment, develops its own code of operations, implements its own programme, reproduces its own elements in a closed circuit, and lives according to its own dominant paradigms.

*j)* Autopoiesis is essential to a viable social system as it enables it to accommodate unexpected changes or fluctuations. Such systems become autopoietic by modifying their structures and behaviours and /or changing the causal networks that derive from their paradigms and methods for achieving their goals.

*i. An example of this is the way in which private healthcare organisations have coped with the shortage of nursing staff in Malaysia by obtaining Ministry approval to bring in foreign nurses from various countries in Asia.*

k) Self-reference occurs in open systems that refer only to themselves in terms of their intentioned purposeful organisational behaviour.

l) Society is a network of systems and subsystems: a complex active system with different degrees of autonomy in our economic, political, social and cultural parts, all striving for survival.

m) Viable social systems must be autopoietic, having the compatibility and mutual production between their dynamic events and the networks that produce them. To survive in an organised way they must at lest maintain compatibility between their events and the causal network of production.

Having listed these propositions, it remains that they may be made operational and verifiable. Mohd. Yusof Omar has provided the means of quantifying these dimensions in the measurement scales used in this study[19, 20].

## 2.6 Six-level Organisational Diagnostics – the Cummings Model

The Cummings Model of Organisational Diagnostics as expounded in "*Organisational Development & Change*", (Cummings & Worley, 2001)[7], presents the method of viewing the organisation from the different viewpoints of the organisation, group and individual and how they interact with the external as well as internal elements of the environment in which they are located.

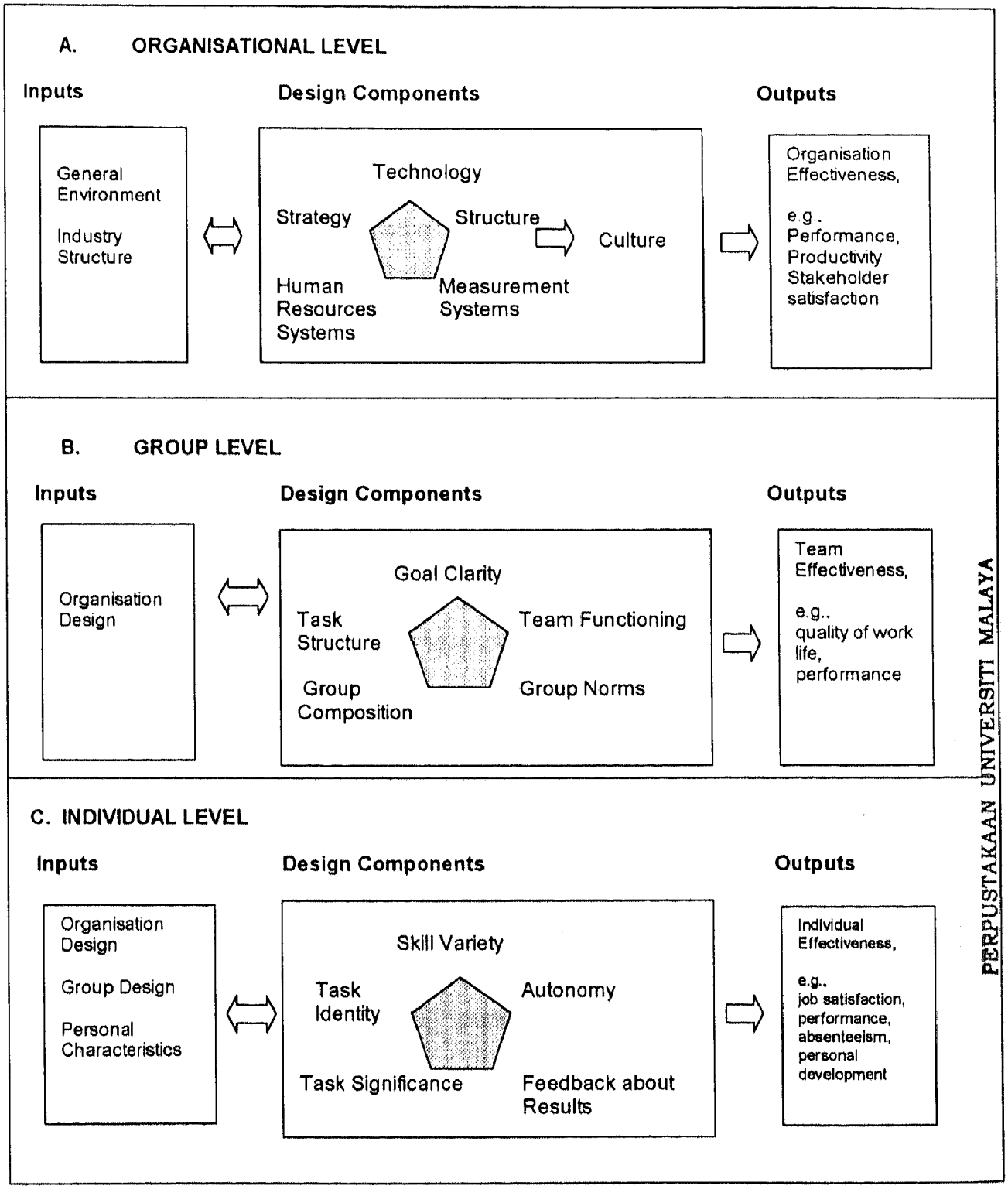
In brief, this approach of diagnosing organisational systems looks at each level as a sub-system of the larger organisational system and examines the following aspects:

1. The inputs that the sub-system has to work with
2. The key design components of the transformation sub-system
3. The sub-systems outputs

The key to effective diagnosis, according to Cummings & Worley, is to know what to look for at each level and how the levels affect each other. This relationship is clearly displayed in the exhibit presented below which provides the comprehensive model which is used in the diagnostic stage of this paper.

The process of diagnosis is facilitated by the measurement system developed by Mohd. Yusof Omar, (2001), as presented in his unpublished manuscripts.

**Exhibit 3 : Comprehensive Model for Diagnosing Organisational Systems (Cummings & Worley, 2001)[7]**



### 2.6.1 The Organisational Level

At this level, the inputs comprise the General Environment and the Industry Structure and these elements are understood in the strategic context, using the methods of environmental scanning and Porter's 5 forces respectively. In line with this, the design components comprise the elements that impact directly on the organisation and its culture, such as, Strategy, Technology, Structure, Human Resource Systems and Measurement Systems which act together to form the organisational culture. This then will have an impact on the final output seen in elements like productivity, performance and return on investment

### 2.6.2 The Group Level

At the group level, the core input is the organisational design within which the group functions. The design components of the group are goal clarity, task structure, group composition, group norms and team functioning. These in turn, lead to outputs of team effectiveness, as for example, the quality of work life and work performance.

### 2.6.3 The Individual Level

The inputs for the individual level comprise organisation design, group design and the personal characteristics of the individual himself/herself. These interact with the design components that are linked to the job function, i.e., skill variety, task identity, task significance, autonomy and feedback about results. These elements working together lead to outputs that should indicate individual effectiveness, i.e., in elements like job satisfaction, performance levels and personal development .

## 2.7. The ISO 2000 Management System – a Diagnostic Guide[24]

The ISO 2000 Management System proposes a process approach in developing, implementing and improving the effectiveness of a quality management system that will enhance customer satisfaction by meeting customer requirements. The process approach as used in a quality system emphasizes the following:

a) Understanding and meeting customer requirements
b) The need to consider processes in terms of added value
c) Obtaining results of process performance and effectiveness, and
d) Continual improvement of processes based on objective measurement.

The ISO 2000 system new requirements as compared against the ISO 9002 system places greater emphasis on the links between the different process events. The model presented below presents the essentials of a quality based management system.

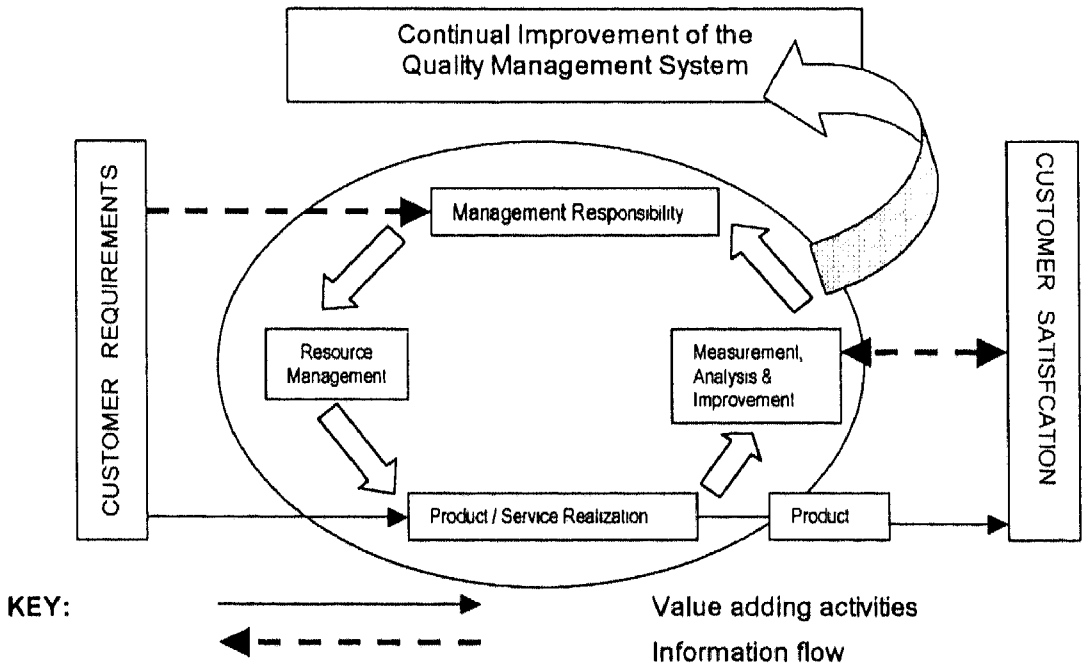


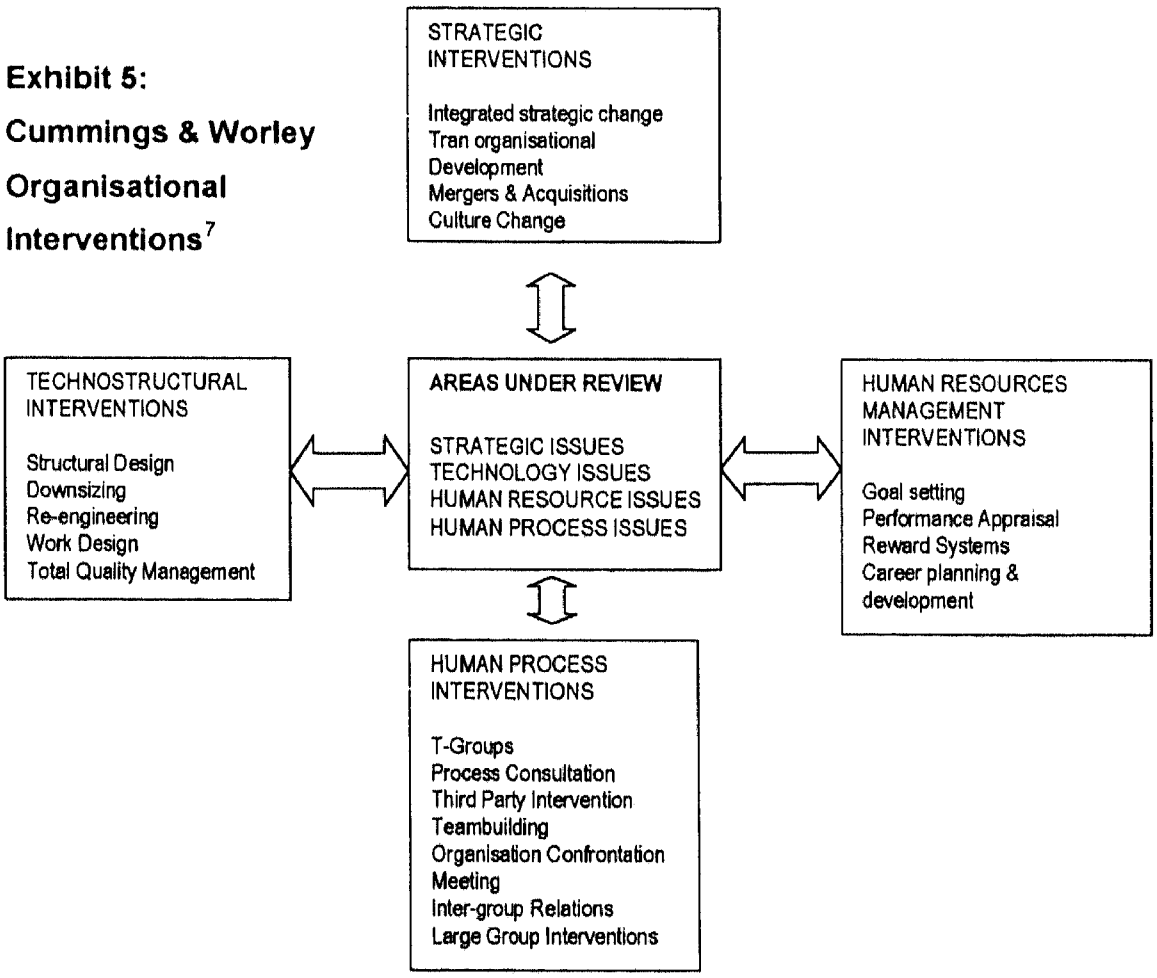

**Exhibit 4: Model of a process based quality system**

The model above provides the guideline for organisations that wish to pursue and maintain continual quality improvements. The guide for assessment for this paper will be taken from the Malaysian Standard, Quality Management System –Requirements, Table B-2.

## 2.8. The Cummings Intervention Model

The Cummings Intervention Model incorporates all the possible interventions and approaches that would be possible for an organisation which is seriously considering change initiatives. The choice of particular interventions would depend on the gaps identified in the selected organisations. The model below presents the scope of the interventions possible with selected processes that would be necessary to carry out the chosen interventions.

**Exhibit 5:**
**Cummings & Worley Organisational Interventions**[7]



## 2.9. Action Research

Action research has been defined as "a type of applied social research differing from other varieties in the immediacy of the researcher's involvement in the action process"[5]. Clark (1972), in his discussion on action research further added that it should have an aspect direct involvement in organisational change, as well as, simultaneously providing an increase in knowledge.

The practitioner of action research is expected to document the change process and provide feedback on the process in order that it may be stopped, changed or modified, (Dick & Swepson, 1994)[9]. As such, action research has a dynamic role to play in the development of organisations and in an organisational diagnostic exercise.

Action research is differentiated from applied research in that action research attempts to create organisational change as well as, study the process (Saville, 1995)[25], (Borgia, & Schuler, 1996)[2],

This approach is taken for this study as the researcher was on the management staff of the organisation and actively involved in the day-to-day operations of the organisation for the period of the study.

### 2.9.1 Participant Observation[22]

The "participant observer" field technique is taken from anthropology. The method focuses on the insight that is derived from a community's values, dynamics, internal relationships, structures and conflicts, and more importantly, from their observed actions, rather than from their (normative) statements of what "is". The participant observer practises immersion, to the extent permitted, in local life in order to understand and document how things work (Saville, 1995)[25].

Participant observation is an excellent method if there is the time, and it can be justified particularly where individual researchers already have prior

exposure in the selected community. A recent on-line publication of the Institute of Sustainable Development (ISSD)[13] highlighted the three main dangers of this method as:

(i) Subjectivism : it is the least objective of all methods, and relies heavily on the integrity and intellectual honesty of the researcher, whose experiences cannot be replicated, by the very nature of the research;

(ii) Documentation may be difficult to access as field notes often contain too much confidential information for wider circulation. Confidentiality is often an issue.

(ii) The method is less suited to "project" situations where the team are outsiders, not so familiar with the area, and where there are time constraints. It is a preferred method when time is available and the subject matter under study lends itself to more discrete methods.

Participant observation was selected as a method for this study as the researcher was a member of the management team in the organisation for a period of 8 years. Also, holding a key functional position, the researcher was actively involved in developing staff training and development programmes linked to continual quality improvement efforts. The issues of subjectivism and bias were noted and, wherever necessary, views and perceptions were counter-checked independently.

The value of participant observation in this type of study is also borne out by earlier unpublished work done by Mohd. Yusof Omar (2001). The value of the diagnostic tools developed by M. Yusof brings a new dimension to participant observation in this study as it provides a simple measurement method that allows some degree of focus and comparison in a complex situation.

### 2.9.2 The Question of Privileged Access

Clark (1972), in his text on action research explored the phenomenon of privileged access where the effects of participant observation were evaluated in connection with the validity of research findings. Some schools of though may view privileged access as a doubtful source of real contribution to the study of organisations. Clark however, finally summarized that the value of privileged access is best seen in the general use of participant observation.

Whilst there are few attempts at participant observation in management situations, there is a role for a problem-oriented researcher cum manager, to make use of the fact of privileged access to gather data that will lend itself to problem resolution. However, it is noted clearly that fact of privileged access may also lead to researcher bias, unless it is appropriately handled.

As the study being reported relies to a large extent on participant observation, it is noted that the concerns have been taken into consideration and wherever possible – attempts to corroborate findings have been made.

However, the researcher submits that the paper itself takes on a particular paradigm in the way the situation is viewed and reported – and it is in that light that it should be understood.