- **APPENDIX B [1]**

Management principles

- scientific management (Taylor, 1947)
- general management theory (Fayol 1949)
- human relations
- system approach
- contingency approach

System approach to organisational design

- places emphasis on the organisation as a system
- is sub-devided into **inter - related sub - systems**
- the information flows within and between subsystems
- decision making, control and mechanism are emphasised

Contingency approach acknowledges that organisational structure and characteristics should reflect the organisations situation taking into account **situational factors,** such as age, size, and the nature the business environment. It is a development of system approach by examining the **situational variables** which affect sub-system and the inter-relationship between subsystems.[1]

Summarisation of contingency factors ant effects on organisation structure ([1], pp 317)

- larger organisation in stable business environment needs
  - more formalised structure
  - standardisation of activities
- large organisation in a complex environment needs
  - higher degree of decentralisation
- organisation diversified in many markets needs
  - divisionalised rather then a functional structure reduce the co-ordination needed across units because each division is usually a separate functional structure, but some functions need to be centrally co-ordinated
- organisation operating I a more dynamic business environment needs
  - more organic structure remain flexible to unpredictable changes
  - co-ordination mechanisms are much less formally standardised
- organisation operating in a "hostile" business environment
  - centralised structure
  - tight co-ordination
  - direct supervision from top management
  - quick and decisive response to the threats
- organisation operating in an environment where external control (holding, government) is great
  - centralised
  - formalised structure
  - accountable to outsider
  - justify their decision and behaviour

[1] tese situational (contingency) factors is explored in detail by Mintzberg, Galbraith, Robbins

Variety of organisational structures:
there is not a right way or a wrong way to design an organisation, An organisation may move from one structure to another in response to change of **contingency factors** (size, age ...), Restructuring is now a normal activity in the life of the organisation.
Mintzberg suggests that **analysis of contingency factors** leads to **the identification of** several **natural structural configuration.**
Mintzberg defines an organisational structure in term of five **parts**:

1. the **strategic apex** consisting of the top management
2. the **middle line** consisting of functional middle managers that control the technostructure
3. the **technostructure**, consisting of staff who design an maintain the organisations rules and procedures
4. the **support staff** who are specialists providing support services outside the operating core
5. the **operating core** consisting of staff who do the basic work to produce the organisations product and services

The **main configurations:**

- simple structure
  - small organisation
  - highly centralised
  - little formalisation
- a machine bureaucracy
  - mass production organisation
  - high normalisation
  - high concentration
- professional bureaucracy
  - professional staff making up the operating core
- diversified (divisionalized) structure
  - is sub-divided autonomous units
  - sub-unit adopt a functional structure
- an autocracy
  - operating core are highly trained, highly specialised
  - handling non-routine , complex technologies

The Viable System Model

Beer approaches organisation design and dynamics from systems and cybernetic[2] perspective and serves as a useful **model to determine information system requirements** and the **influence on decision making** which may affect DIS development. Beer interpreted initial work of **Ashby.** Ashby enhanced understanding of **complexity of systems,** precise measure of complexity: **the variety of a system** meaning the **number of distinguishable elements (or states) of system.**

[2] is the science of control and communication

Ashbys Law of Requisite Variety: says that only variety absorbs variety. In other words the only way to control a complex system is with a control system which is at least equally complex. **Information** is an important factor in this context since the actual mechanism of control involve s information flows between controlling system and system being controlled.

Organisation are complex systems and the **complexity of individual managers** (each viewed as a control system) has to be at least as complex as complexity of controlled system (e.g. department) being managed) In reality the business environment has far more variety than managers can cope with. The problem is that managers can manage only if the variety of what is being managed is less or equal to the variety of management. **This paradox** is resolved by recognising the operation two balancing mechanisms:

- attenuators: reduce variety
- amlpifiers: increase variety

At the hearts Beers model is the concept of **viability.** An organisation is **viable** if it is capable of maintaining a separate existence. It place emphasis on factors which may influence long term viability such as **attitudes, values, levels of communications and corporations.** A viable system exist in a **dynamic environment** within which it maintains it separate existence and which may be a pre-condition of viability. An environment is typically complex, capable of exhibiting high variety. The environmental states are of complexity which is beyond the ability of the individual managers.

Beers First Principle of Organisation states that the sum of varieties of each part must equate throughout the environment - organisation - management trinity. Clearly attenuating and amplifying mechanisms are required to balance the difference in variety between environment and organisation and between organisation and management. In organisation - management variety balancing, managers problems and have to manage the problems and tasks of concern demanded by managers role within the organisation.
Consequently they **require relevant information and create the information needed to complete tasks and as a part of the problem solving process are information managers. Thus the managers need to balance the variety of tasks and information processing requirements (high variety) with their information processing capacity (low variety) The main challenge** for managers is how to utilise **attenuation** (reducing information needs) an **amplification** (delegating tasks to others) tools to balance the varieties and as a same time meet the acceptable level of performance.
The Recursive System Theorem (Beer) states:

> In a recursive organisational structure any viable system contains, and is contained within, a viable system.
>
> (An organisation is structured in autonomous subsidiaries (divisions) which is themselves are structured in terms of autonomous departments is an example of recursive structure.) Individual managers is themselves a viable system.

Guidance

Recursive structure are essential to ensure that an organisation copes with the high variety of organisational tasks that have to be dealt with by **distributing responsibility, discretion and autonomy** in relation to tasks down to all levels. Each recursive level can be thought as a **management domain** which exhibits a high level of autonomy, able to specify and implement its own policy. **The principle of recursion emphasises that management is a distributed processing activity which requires a distributed processing system to support it.**

Five System Model

Beers VSM recognises that at any recursive level is a collection of **operational elements** which carried out defined tasks, **metasystem elements** which ensure long - term viability of operational elements. five discrete systems are defined through which the various operational and metasystematic elements interacts

System -1 **Operational elements**
These are the units that are to be controlled by the
control
intelligence
policy metasystemic elements

System - 2 **Co-ordination and monitoring**

System - 3 **Control function**

System - 4 **Intelligence function**

System - 5 **Policy function**

Implication for information systems requirements

From the VMS model we can see the interrelated nature of **management process and information systems.** The Beers VMS model identifies **classes of information systems** which applicable at all level of recursion(all management domain)

1. Co-ordination information systems
- supply information to enable co-ordination between operating elements
- basic transaction of business are recorded

2. Control information system
- provide information for the effective control resource bargaining, decision making on the operational level)
- monitoring of operating elements

3. Policy information system an effective policy function manages the interactions between intelligence (long-term , outward looking) and control(short-term, inward looking) functions so as to **minimise (residual) information needs at the policy level.** Policy makers also tend to require access to information **quickly and in an unstructured, chaotic manner.**