Total No. of Questions : 12] [Total No. of Pages : 12

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B.E. (Electronics)

MANAGEMENT INFORMATION SYSTEMS

(2003 Course) (404210)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates :

1) *Answer any 3 questions from each section.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*

SECTION - I

Q1) a) Why is a MIS as practiced in industry a pyramid structure made up of decreasing complexity information processing layers? Explain preferably with the help of an example. **[8]**

b) "As convergence technologies evolve over the next decade (a forecast), a new world will emerge. Analysts predict : **[8]**

- Networks will speed up by an average of 50% a year, the historic norm.
- In advanced world, faster broadband and mobile systems will be strong enough for commuters to check for traffic jams and watch soap operas on their cell phones.
  - In Japan and Korea, this is a reality in 2004 itself, while U.S. will catch up in a decade.
- By 2012-13, practically every machine in the realm of communications - every gadget that sings, talks, beams images or messages - will sport powerful computer and a network connection. And every bit of digital information, whether it's phone call, a song, a Web page, or a movie, will flow among these machines in the very same river of data.
- By the end of this 10-year-cycle (i.e., by 2020), the change could be extreme :
  - Web pages will snap to life.
  - Hundreds of thousands of political bloggers, flu fishermen, and chefs will be uploading gobs of video programming - creating their own channels.

P.T.O.

– This plethora of Web shows will compete for attention with TV fare, Internet radio, video e-mails and games.

– All of it will play on televisions, computers and cell phones, which will be different flavors of the same machine. The concept of a network or a channel will go away. They are artifacts of old technology."

What do you understand by the term "Convergence Technology"?

OR

Q2) a) "The dramatic technological shifts ahead are likely to shakeup age-old concepts at the foundation of economic life. In the coming markets of moving bits, who owns what? Will people buy programming and machines? Or will they rent and subscribe? Innovative companies will sort out these questions, leading the way in building new business models for the coming age. Those who figure out how to reach through the networks to deliver customized information and services will be the architects and kings of the converged economy."

Discuss preferably with the help of examples business implications of rise of convergence technology. **[8]**

b) With the help of Figure (1) explain how convergence technology enabled information systems will deliver promised business transformations for business value creation? What will be their relationship with quality information systems? **[8]**

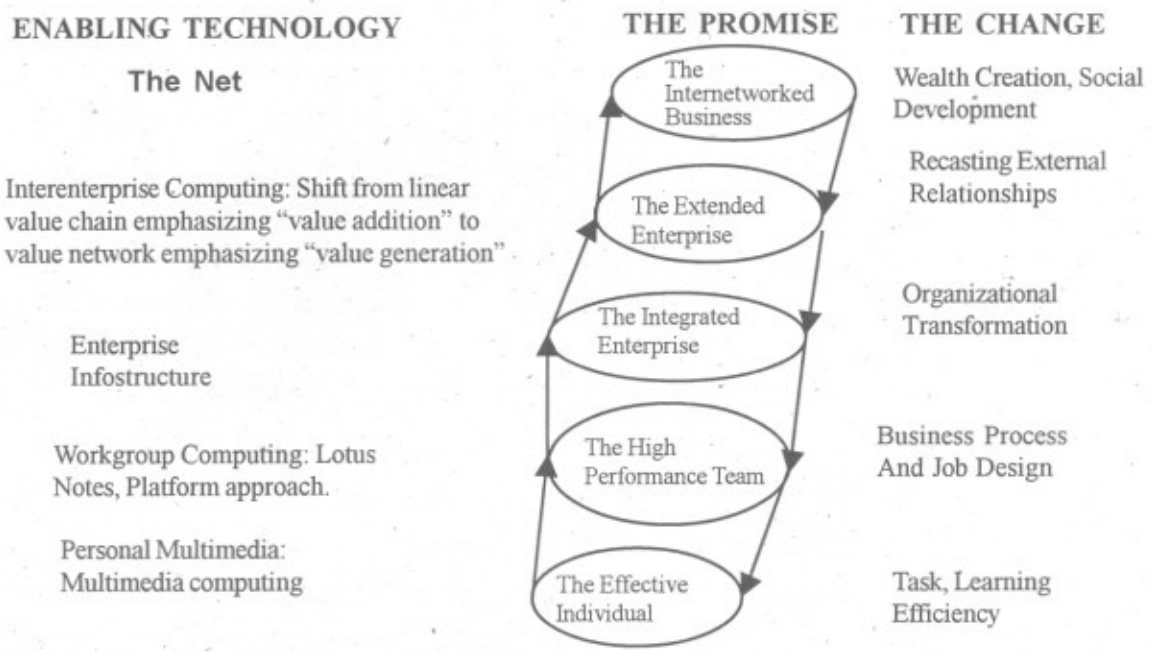

Fig. (1): Business Transformation Through Convergence Technology

Q3) a) "Businesses have changed a lot but given that customer requirements are becoming increasingly local and instant, it is business processes and models that have changed the most".

With the help of Figure (2), explain evolution of business models from ad-hoc, open loop business model to a closed loop engineering quality business model to a model describing generic business process as integral to a closed loop information and control system constituting a business process *IS* view. **[8]**

b) Figures (2) gives a systems view of a business process represented as a generic business process *IS* view and as integral part of a closed loop information and control system characterized by continuous information origination and processing in the presence of uncertainty and the emergent all encompassing view of Information Integrity for business competitive advantage. Figure (3) models a business process, with a controls interpretation, as integral to a close loop information and control system.

Based on Figures (2) and (3) write short notes on any two of the following : **[8]**

i) Uncertainties in business process *IS* view,

ii) Complex error,

iii) Information Integrity Risk.

OR

Q4) a) With the help of Figure (3), describe in your own words an *engineering system with its physical variable controls and process controls* modeled as an engineering business system with a requirement to meet customer requirement. **[8]**

b) Write short notes on any two of the following (To answer you may refer to Figures (2) and (3)) : **[8]**

i) "With external and internal customer requirements becoming local and instant, a system is emerging to be a potential source of information". Explain.

ii) In a business *IS* view, information is function of source, process and "recipient". Explain.

iii) Shift *from* data storage and retrieval *to* information evaluation, storage and retrieval.

iv) List the multistage dynamic decision stages constituting the information origination a system undertakes to reduce the uncertainty it (system) experiences about the environment.

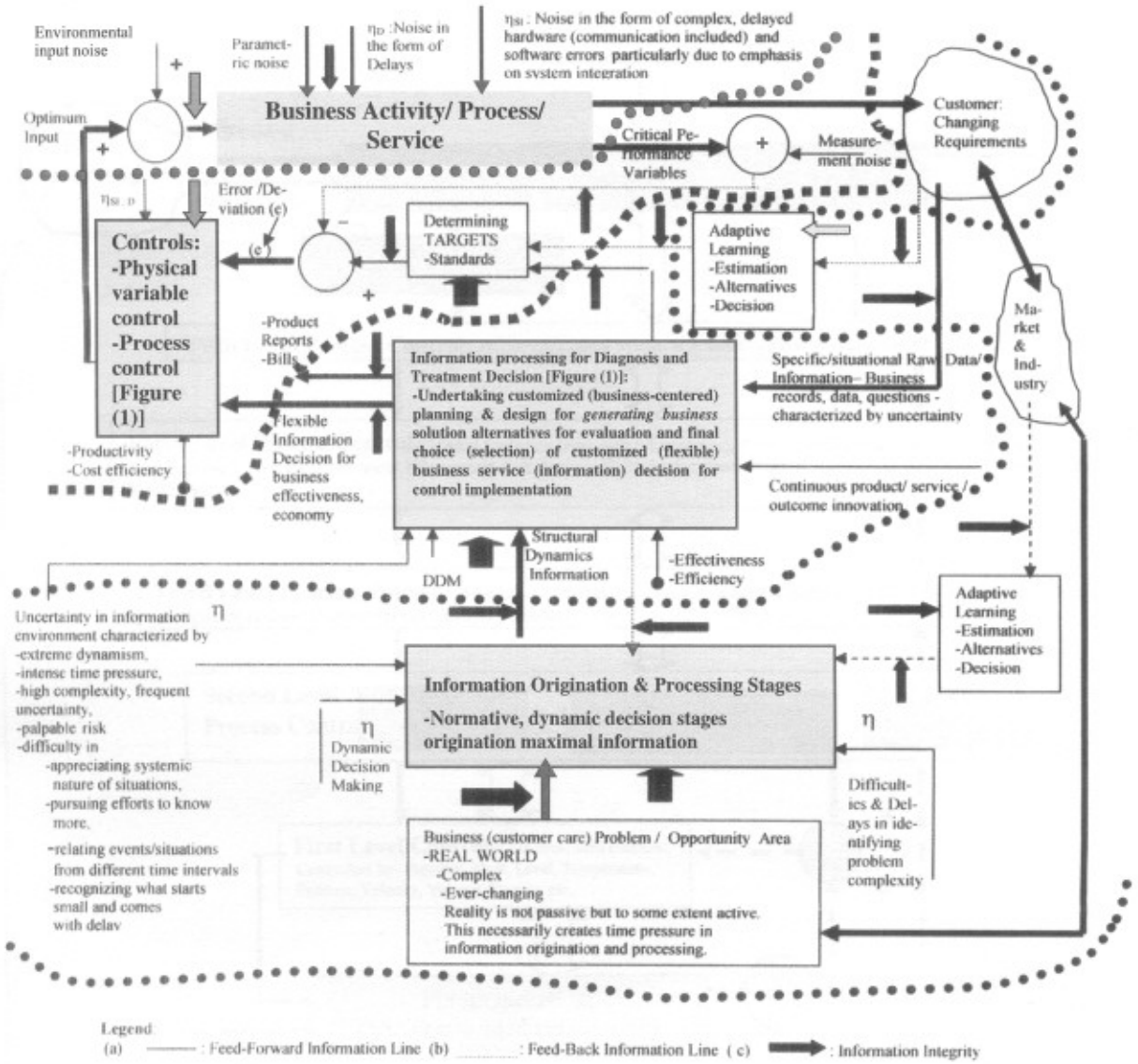

Figure (2) : A systems view of a business process represented as a generic business process *IS* view and as integral part of a closed loop information and control system characterized by continuous information origination and processing in the presence of uncertainty and the emergent all encompassing view of Information Integrity for business competitive advantage.

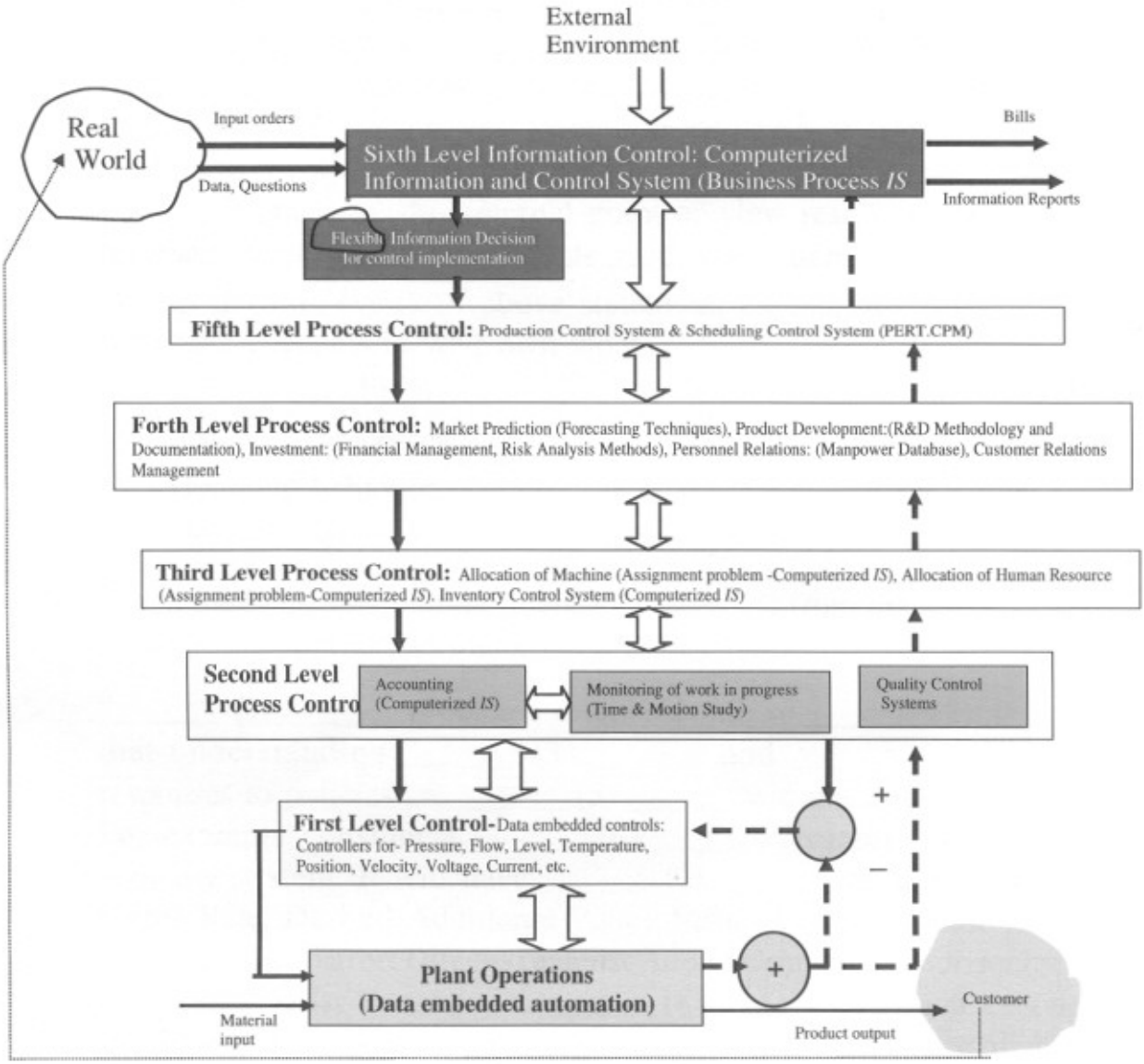

Figure (3): Modeling a business process, with a controls interpretation, as integral to a close loop information and control system

Q5) a) "The system dynamics approach to complex problems focuses on feedback processes. It takes the position that feedback structures are responsible for the system changes over time. The premise is that dynamic behavior is a consequence of system structure. As a result the system dynamics approach looks within a system for the source of its problem behavior. For example, inventories are not assumed to oscillate merely because consumers periodically vary their orders. The system dynamicist takes the view that inventories behave as they do for reasons internal to the system, for reasons pertaining internal structure of the system. In practice, this internal point of view results in models of feedback that bring external agents inside the system."

Within the framework of above statement, explain any <u>three</u> of the following concepts in your own words : **[9]**

a) Complex problem,

b) Feedback processes,

c) Dynamic behavior,

d) "Bringing external agents inside the system".

b) Fill in the blanks by putting in appropriate word from the set of words given at the appropriate blank indicated by number. **[9]**

"_____ (1) _____ problems often become so _____ (2) _____ that understanding _____ (3) _____ and _____ (4) _____ responses to policies are _____ (5) _____ without a formal model. For example consider a _____ (6) _____ structure of a police response system. It will have _____ (7) _____ variables such as Crime Rate, Desired Additional Police Effort, Socioeconomic Effect on Crime Rate, Effort Directed against Addict Criminals, Imprisonment Rate, etc. It is far from easy to _____ (8) _____ how such a model would behave when, for example, community awareness of drug problem is _____ (9) _____, and yet such understanding is what we expect of those charged with designing and implementing public policy for real systems."

Set of desired words to choose appropriate word to fill in the blank :

{anticipate; many; impossible; increased; feedback; behavior; complex; real world; predicting}

Note : You may write answer by pairing the number and the word;

OR

Q6) a) Define in your own words any three of the following System Dynamics variables : **[9]**

i) Level variable,

ii) Rate variable,

iii) Parameters and input variable,

iv) Supplementary variable,

v) Auxiliary variable.

b) Fill in the blanks by putting in appropriate word from the set of words given at the appropriate blank indicated by number. **[9]**

A simple _____ (1) _____ feedback loop centering on traffic congestion and highway building could include such _____ (2) _____ as the number of cars or _____ (3) _____, extent of the highway system, traffic congestion, driving safety and comfort and highway construction. As the number of cars or the amount of driving _____ (4) _____, traffic congestion increases, _____ (5) _____ driving comfort and safety. That sets up _____ (6) _____ that lead to _____ (7) _____ highway construction to _____ (8) _____ traffic congestion. The loop is negative because an _____ (9) _____ in traffic congestion eventually results in pressures to decrease (negate) it.

Set of desired, words to choose appropriate word to fill in the blank :

{lesson, increases, more, variables, pressures, increase, reducing, negative, amount of driving}

Note : You may write answer by pairing the number and the word.

SECTION - II

Q7) a) System Dynamics models a system with the help of causal loop diagram. For a police response system assumed in a study of heroin addiction, crime and community response study, figure (4) gives a causal loop representation. **[8]**

i) Describe in your own words the police response system conceptualized in Figure (4).

ii) Are there feedback loops in the system conceptualized in Figure (4)? Indicate the feedback loops.

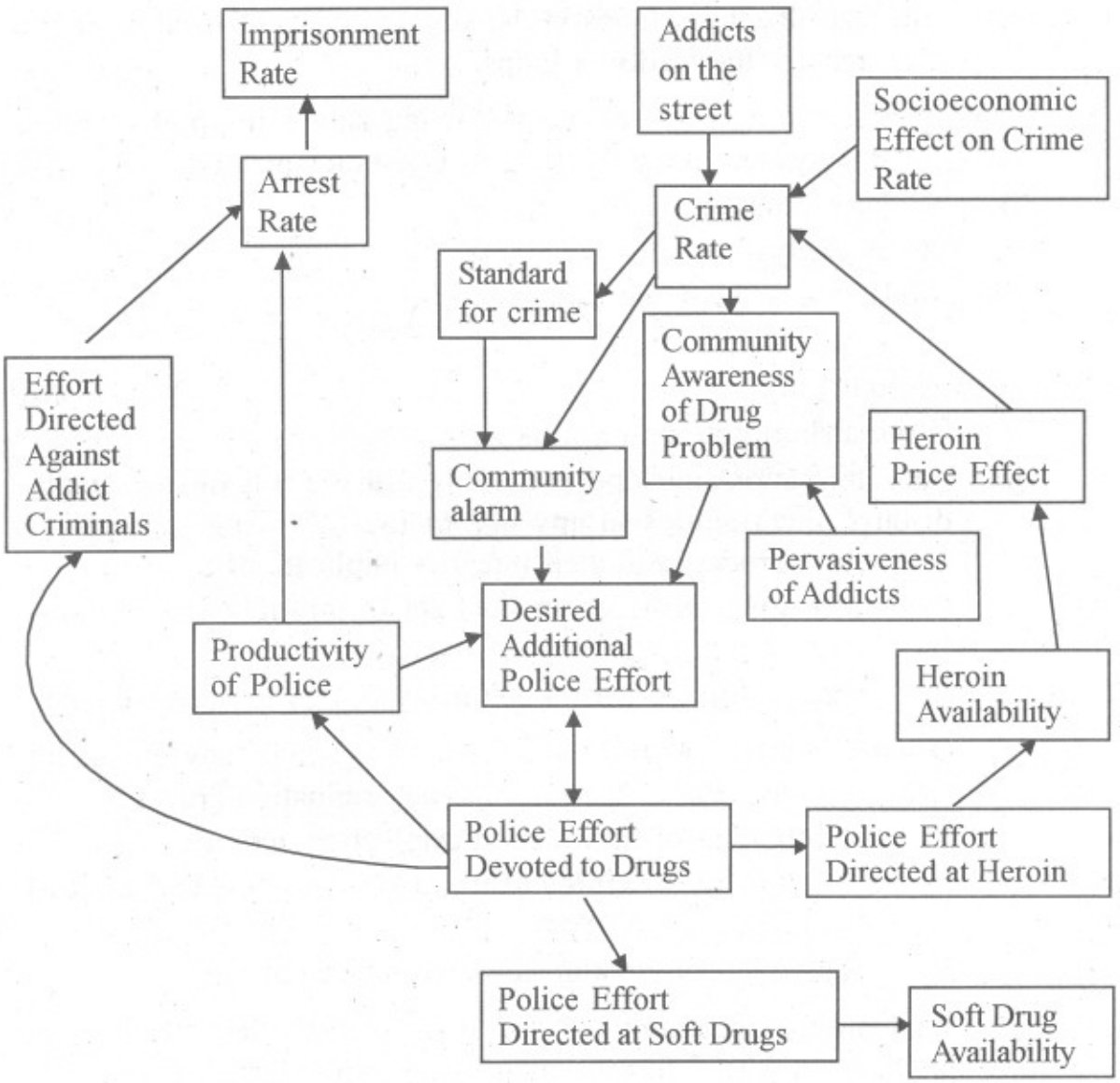

Figure (4) : Conceptualization of a police response system

b) Briefly describe any two of the following stages in approaching a problem in a system using the System Dynamics methodology. [8]

i) Problem identification and definition,

ii) System conceptualization,

iii) Model formulation,

iv) Analysis of model behavior.

OR

Q8) a) For a basic production sector Figure (5) gives a causal loop representation. [8]

i) Describe in your own words the basic production sector conceptualized in Figure (5).

ii) Are there feedback loops in the system conceptualized in Figure (5)? Indicate the feedback loops.

b) Briefly describe any two of the following stages in approaching a problem in a system using the System Dynamics methodology. [8]

i) Model evaluation,

ii) Policy analysis,

iii) Model use or implementation.

Q9) a) Answer following : [8]

i) Write a short note on information envelope.

ii) For information envelope, preferably with the help of an example, discuss uncertainties in any one of the following information origination process and their integrity implications :

1) From long term design goal set to multiple criterion and many factors,

2) From multiple criterion and many factors to operable goal.

b) i) Discuss, preferably with the help of an example, any one of the following elements of the information origination process.

1) Coordination of information origination activities,

2) Selection of flexible information decision and control scheduling,

3) Information origination resource management.

ii) What are the uncertainties faced by the element described by you in Question 9(a)? What are their integrity implications? [8]

OR

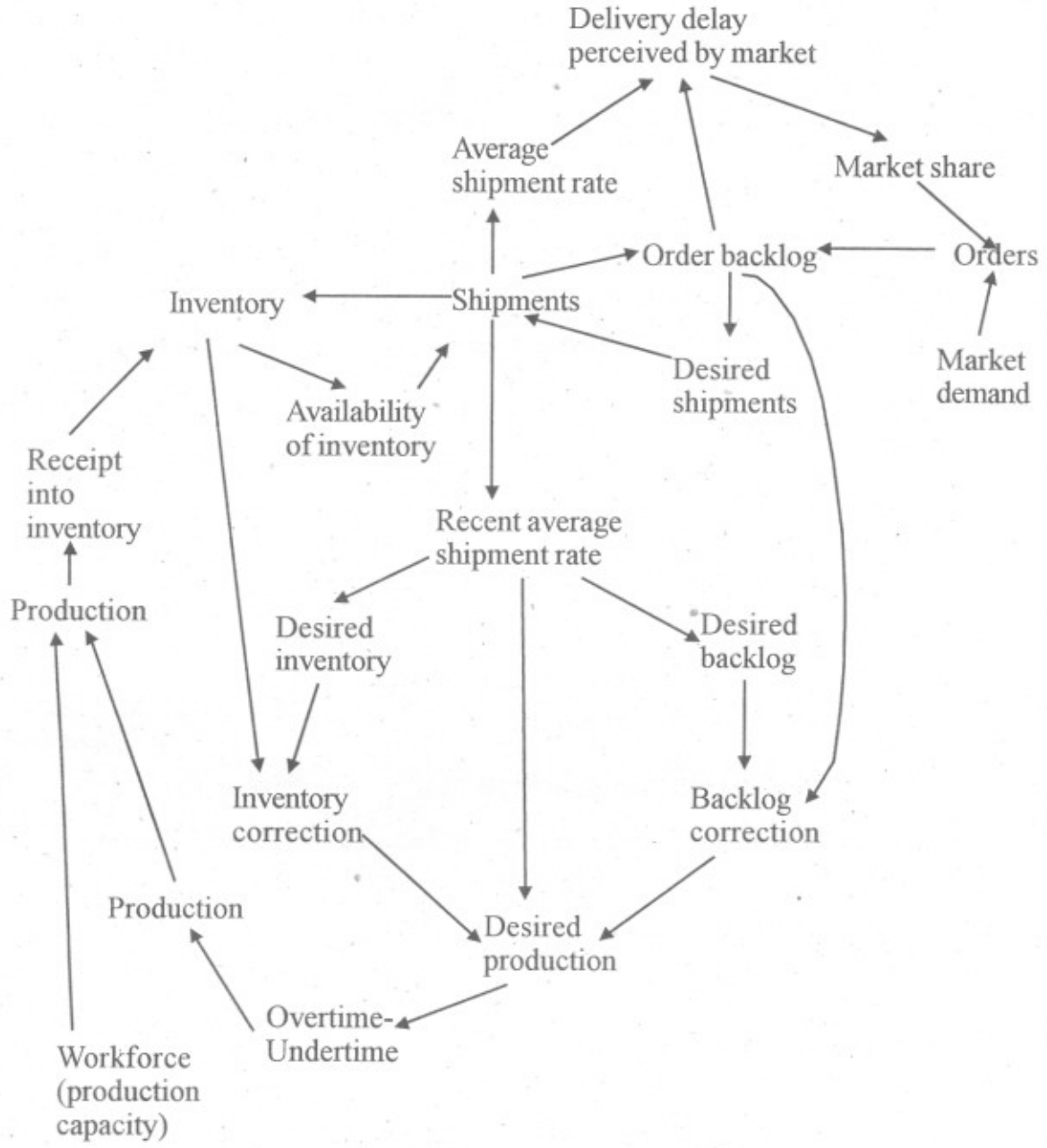

Figure (5): A causal loop representation of a large development project

Q10) a) i) Briefly describe any two of the following existing integrity mechanisms.

1) Security based definitional approach to integrity,

2) Auditing practices as in accounting,

3) Process centered quality approach.

ii) What is their main limitation? Explain.

[8]

b) "Existing practice is to verify data for its integrity. However, given the reality of ever changing environment, requirement for the improved decision-making is to view information as a composite good of interrelated attributes, namely, usefulness, usability and integrity."

What is "Usefulness-Usability-Integrity paradigm"? What is its main implication? **[8]**

Q11) a) i) Define attributes of Information Integrity.

ii) Equation (1) gives Cost benefit Analysis Equation of Information Integrity.

$$\Delta IU(I)\,|_{Si} = [\{[\alpha(I) \times \beta(I) \times IUUB(I)]\,|_{Si}\} \times \{A(I)\,|_{Si}\}] - [COST_{OI}(I)\,|_{Si} + COST_{ANALY}\{A(I)\}\,|_{Si} + COST_{OPPORT}\{A(I)\}\,|_{Si}]$$

..... Equation (1)

Define each term in Equation (1). **[9]**

b) Figure (6) gives a systems view of a design basis for the "Information Integrity Technology Development System".

Explain the systems view in Figure (6) in your own words. In the process also explain how it facilitates the system achieving competitive advantage. **[9]**

OR

Q12) a) Write short notes on any two of the following : **[9]**

i) Acquisition Cycle under the I*I Technology Development System.

ii) Utilization Cycle under the Information Integrity Development System.

iii) Information Integrity Control through Information Integrity Technology.

b) Write a note comparing Traditional *IS*, Quality *IS* and Integrity *IS*.**[9]**

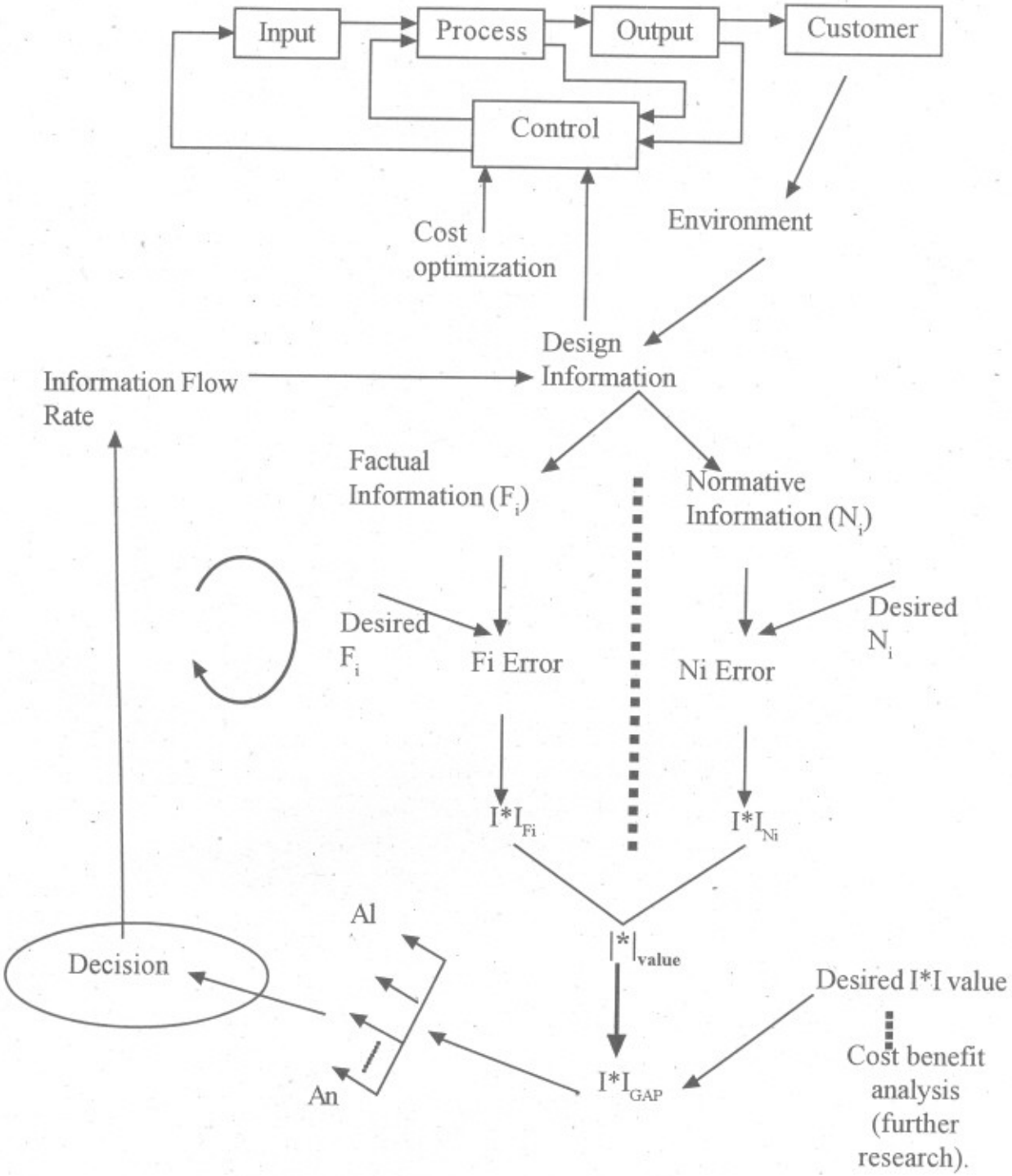

Figure (6): A systems view of a design basis for the "Information Integrity Technology Development System" leading to Integrity Information System

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