Who can be a good Systems Analyst?

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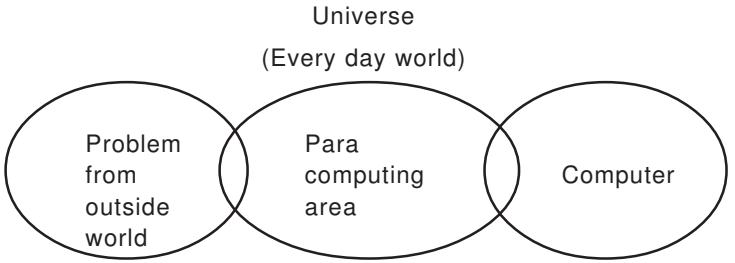
"Logic is the essence of good systems analysis"

CHAPTER - 2

THE SYSTEMS ANALYST

2.1 a. What is Systems Analysis ?

In our day-to-day life there are many problems which can be solved with the help of computers. Such problems may be related to transportation system, communication system, educational system or business system. The systems analysis in broad outline decides how these problems in the outside world can be related to a computer system. So, systems analysis in Management Information Systems (MIS) may be considered as a link between the actual problem and the computer. The procedure for computerizing outside problem is made more complex by a large area which can be called as "PARACOMPUTING". The major part of para-computing is system analysis. In addition to systems analysis, para-computing also includes data collection and data preparation.



In fact, systems analysis looks at an entire problem in its context. It then investigates systematically with the objective of the system in focus. Finally it lays down the criteria for system effectiveness. Systems analysis also evaluates the alternatives in terms of effectiveness and cost.

Thus, systems analysis is concerned with :

1. Investigating, 2. Analyzing, 3. Implementing and 4. Evaluating information system in organizations.

b. History of Systems Analysis

The first systems analyst, it is said, was born some 6000 years ago. This unknown system analyst said to Khufu, the builder of the great

pyramid " O Noble Khufu, it is time we got organized. We have been pushing this rock through the desert in the wrong direction for seven years ". While his fate is known, the fact that the fellow had clear idea about the goal (the construction of pyramid) and the method (routing techniques) is of great interest to us. In memory of this person, even now information systems are identified by the pyramid structure. But the real boost to system study came after the second world war in this century.

The foundation for modern systems analysis was laid by British Scientists working in the field of radar technology during world war II. The idea of radar as a system evolved as the experimenters moved closer to solving individual parts of the total problem. In fact they had to integrate people (Engineers, Meteorologists, Technical personnel and War Generals) knowledge and industrial technology. Thus integration is the keystone in systems analysis.

Soon after the war, US Air force wanted to increase its strength from 4000 air-craft and 300000 personnel to 80000 air-craft and 2.5 million people in one year. Harward Business School was given the problem which solved it in a year using system concepts.

The RAND (A division of Remington Rand) was responsible for evaluation of weapons systems and production of B-52 bombers in 1950. The concept of 'Think Tank' within the systems has come into vogue. Then in 1960, it was found that these ideas could be implemented effectively in business systems also. In 1961, when Kennedy became President of US, a system called PPBS (Planning Programming Budgeting System) was created and the military budget was prepared. In 1964, the RAND Corporation used system analysis to study the future possibility of Extra Terrestrial Transportation in 1990s. Also RAND used systems to study advancement in education, urban planning, medicine and law enforcement. Stanford Research Institute applied systems analysis to the problem of interaction between science, technology and society.

In fact, systems analysis is the analysis of business systems and not about computers. But the growth of systems analysis is closely related to the growth in the use of computers. Thus, computer acted as catalyst. Hence the expertise in computer programming is taken as a pre qualification for the work related to systems analysis and design. The information system as a subject-of study was introduced in Western Universities in 1960s and in Indian Universities during 1970s. Now it is a regular subject of study in almost all the universities imparting education in management and computers.

2.2 Systems Analyst :

a. Who is a Systems Analyst ?

Individuals who perform the systems investigation as distinct from those merely involved in the detailed computer programming are called "Systems Analysts". The programmer works within the framework provided by the Systems Analyst. If the framework or the outline is poorly designed, then the result is bound to be much off the mark. A systems analyst is like an architect and his work assumes greater importance because he has to design a system for the future.

Thus a Systems Analyst designs information systems which meet organizational objective, promote integration of activities, facilitate control; and which are flexible and robust.

Data processing technology mainly involves systems analysis techniques. **That is, systems analysis is the brain for data processing.** Though computer is a powerful tool in the systems analyst's work, in the final analysis, it is the systems analyst who determines what data should be processed and how, when and where. So, a system analysts' job consists of :

1. Gathering facts about existing information system.
2. Analyzing the basic methods and procedures of current information system.
3. Determining information needs.
4. Modifying, redesigning and integrating the existing procedures in the new system specifications to provide the needed information.

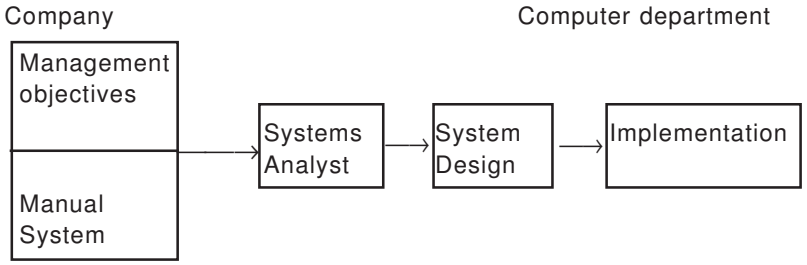
In addition, he should also recommend justifiable equipment changes.

Although it is common for a systems analyst to know computer programming, one usually does not do the programming work on a system. In fact, an analyst works with programmers who are assigned specific programming tasks in a project. Thus the systems analyst is more like a manager who (1) determines the design of the overall system and (2) obtains the necessary technical help from programmers, from specialists and equipment engineers (3) follows the system through design, implementation, follow-up and re-evaluation.

b. Systems Analyst's relation to the company :

In a business organization, the systems analyst is the interface between the company and the computer system. He has to interact with the top management, understand policies and procedures. Many a time his important task is to convert manual systems into computer systems. He has to work with other departments to gather information. His

work within the computer department involves -
1) Choice of programming language
2) Keeping within the schedule and budget
3) Documentation of policies and procedures.



c. Knowledge and Qualities expected of a Systems Analyst:

To carry out his duties, an analyst should know :

1. Business Methods : That is, he should have a fairly good understanding of the organization structure, management and administration methods, system techniques, production planning and control, inventory control, accounting procedures, operation research and simulation techniques.

2. Computing : This includes the knowledge of data processing, programming languages and computer operations. He should himself be conversant with the information regarding various computer systems available in the market, their cost, benefits, versatility etc. He should have a working knowledge of the equipments used in the system.

In order to fulfill his responsibilities a systems analyst must be endowed with :

1. A broad and flexible outlook.
2. An orderly mind.
3. Disciplined approach and logical neatness.
4. Ability to express thoughts, ideas and proposals clearly both orally and in writing.

d. Main objective of a Systems Analyst

The main objective of a systems analyst is to provide right type of information, in right quantity, in right time and at right cost to management or for end user.

e. Role of a Systems Analyst :

From the above discussion, we understand that the systems analysis is a difficult task and it requires a multifunctional personality. At different times, he will play some or all of the following roles:-

1. Systems Analyst - an agent of change : A systems analyst works towards the future. Future is uncertain and different. Change is the only thing which is permanent and the systems analyst has to prepare a vehicle to work in that changing environment. The greatest hurdle for him is that people resist change. To overcome this, he has to secure user acceptance through user participation in the design and implementation of the system. Hence, he is the creator of new environments. For this, he has to be a persuader as well as a controller.

2. Systems Analyst - a motivator : Acceptance cannot be forced down the throats of system users. Proper identification of right personnel and exacting feeding of right motivating factor can go a long way in making a system successful rather than downright adamance. A good motivator has to be a good psychologist.

3. Systems Analyst - an organizer : A system is the systems analysts' conceptual child. Hence he has to be clear about all activities of the system. The sequence of activities, their purpose and their consequences must be clear to him. He is responsible for the execution of all activities and events and hence that of the system. The role of the organizer includes that of puzzle solver whenever problems arise. He is also an evaluator of his own system. He diagnoses the lurking problems and likely opportunities in his system. He should have professional loyalty. He should have the capacity to probe into any problem and arrive at the real cause. He should not take things at face value. 'Digging' must be his second nature.

4. Systems Analyst - an architect : A systems analyst must have a fairly good idea of his final system at the raw material stage itself. He prepares the blue print, modifies, improves, and provides aesthetic values to his product. For example, a systems analyst may bring in a better changed environment for the users. It may bring in changed attitudes towards systems. Hence, he is a simplifier, an artist and a sculptor, all rolled into one.

5. Systems Analyst- an intelligent salesperson : A good Systems Analyst is one who can sell a refrigerator to an Eskimo. System selling is harder than that because the systems analyst has to sell it to a user, who knows the existing system in and out. To sell his system he should be a good communicator and genuinely interested in understanding the real needs of the user. In fact, system selling takes place at all stages of design and later at all levels of the organization. Diplomacy and fineness are the watchwords of any systems analyst. Logic is the only tool in his hands to succeed.

2.3 Systems Approach and Systems Analysis :

It is essential at this stage itself to understand the differences between systems approach, systems analysis and system design to avoid any confusion in future about these similar looking terms. The systems approach is an orderly way of appraising a problem in the manner of standing aloof and looking at it from all angles. It asks the questions: 1) How many distinguishable elements are there in the problem ? 2) What cause and effect relationship exists between them ? 3) What functions need to be performed in each case ? etc.

On the other hand, systems analysis is the process of determining what changes must be made in the system and where. A systems analysis is a management technique used in designing a new system, improving an existing system or solving a system problem.

System design is the process of determining how these changes are to be made.

Illustration CASE STUDY - 1

Mr. Sudhir Mekal, the new system analyst was informed by the Branch Manager of Uday Co-opearative Bank that there are problems in reconciling receipt/payment list printed by the mechanical cash register and the physical cash. Sudhir talked to the chief Accountant who informed him that the cashier is new and the fault lies with him. Sudhir immediately contacted the cashier and asked him to be careful. Sudhir informed branch manager that the problem will be sorted out within one week. Next day, he tallied the actual cash with the pay-in-slips and the withdrawal slips and nothing seemed to be wrong. For three days, he also observed the cashier at work and found no apparent mistake. After this he avoided contact with the branch manager. When confronted in the following week he admitted that he did not know much of accounting and hence was not sure how the problem of reconciliation was to be sorted out.

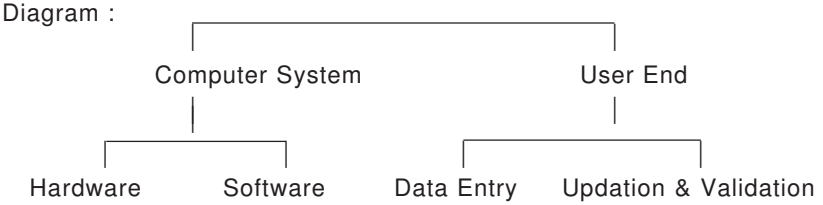
The next day the accounts department discovered that the cash register printed “0” instead of “9” in stray cases. An engineer fixed this fault and everything was fine thereafter.

Evaluate the above situation in the context of role of a systems analyst.

Problem : Problems occur in reconciling receipt \ payment list printed.

Approach : The systems’ approach encourages a systematic procedure to locate the exact problem and devise a solution. Mr. Sudhir should have collected all the information pertaining to the problem before arriving at a solution. “ Probing without prejudice “ is the Systems’ Analysts’ best tool. The approach could have been to find out whether the discrepancy occurs due to fault in the computer system or at the user end. In the computer system, the fault could have been due to hardware or software operational difficulties.

Diagram :



If the problem of stray printing of 0 instead of 9, is suspected to be with the hardware, then he should have tried to analyze and find out whether it is with printer mechanism, printer circuits or CPU or memories interface circuits. For this, he must have some rudimentary knowledge of computer hardware. Before conveying any half hearted conclusions to the Branch Manager, he should have consulted his own department people (Intra-communication). He could have rather called the maintenance engineer then and there and solved the problem. It is necessary that he finds a system solution in the broad sense so that such mistakes do not occur in future. He should sit with the hardware engineer and prepare a list of such hurdles that may take place and preventive measures for the same, after consulting the printer log device book and computer logbook.

At the software end, he should have taken test data after considering input documentation, output documentation and program documentation to verify the outputs.

At the user end, he seems to have done some spade work by tallying the actual cash with the pay-in-slips and the withdrawal slips. This is a welcome effort. He should go by documents rather than actually presenting himself at the cash counter or believing the chief accountants’ word. He must have relied more on check digit, batch total, hash total and arithmetic checks of data validation (see the topic on input design) techniques rather than monitoring the direct inputs.

Conclusions :

This case study demonstrates the role of a System Analyst in solving a problem. The analyst has to identify the correct problem and provide a viable lasting solution. Thus an analyst has to be a puzzle solver. He has to pursue the matter until he solves it fully. Here the problem got solved on its own and not due to the initiative of the System Analyst. The analyst should have used his deductive and inductive logic for a step by step analysis. He should have gone from data to observations and to hypothesis about the nature of the problem.

The systems analyst did not show any broad and flexible outlook by looking inwards at his own system. Instead he has “passed the buck”

to the user end. This will dampen the user's motivation towards the system. The systems analyst should not find any temporary solution. He should go for system solution which will avoid recurrence of any like problem in future.

Illustration CASE STUDY - 2

Surat city under a municipal council has 8 major streets and 24 by lanes within its municipal bounds. Its president for the past 4 years Mr. Shah is facing reelection in January next. But by August, the spate of complaints from people of all walks were pouring in regarding poor management of garbage clearance in the city. The problem has been accentuated by monsoon rains subsequent floods and scattered incidence of epidemics in various parts of the city.

The president turned to a systems analyst to undertake a thorough study of the city garbage clearance capability. The objective was to find out what went wrong and prevent it from recurring in the future.

Assuming yourself to be the systems analyst, suggest a wayout.

Problem : The problem in Surat city was the poor management of garbage clearance. The epidemics in various parts of the city were attributed to garbage piling. The president facing reelection received numerous complaints and a lasting solution was expected from him in the shortest possible time.

Approach : The systems analyst has to collect all relevant information from municipal records about present working of garbage clearance. Also, he has to obtain different methods available for garbage clearance. The questions that will have to be asked are

(i) How much garbage is approximately dumped per day ? What is the accumulation in different localities ? What are the seasonal variations in garbage piling ?

(ii) How much work has to be done now and in future ? This is related to the goals .

(iii) What is the present capacity of garbage clearance mechanism of the municipal council ? This gives a clear idea about the resources available. This is needed to know the gap between actual demand and available resource.

(iv) What improvements are needed ? What alternatives exist to improve the system ?

To answer the first question, the analyst has to search the recent municipal records, talk to the garbage collection team posing questions related to accumulation, seasonal variations, types of garbage etc,. This will enable the systems analyst to decide about the amount of work to be done. A

projection from the past records can also indicate the percentage increase in garbage accumulation per year.

Now comes the question of present resources. The municipal council has six trucks, 120 persons including one sanitary inspector and his assistants, and six DDT sprayers to clean 56 medium size garbage containers. One truck and 10 persons are not in active work at any given point of time. Rainy season adds to the problems by stagnant pools of water near garbage and resultant mosquito breeding and foul smell.

The analyst in consultation with sanitary department divided the areas into primary, secondary and tertiary as per the exigencies. A matching of demand and available resources was evolved. Alternate techniques like "garbage mashing and volume reducing", using plastic bags, employing smaller vehicles to increase the frequency were considered.

Solution :

The present capacity of equipment and personnel was found to be sufficient to complete the task. However, proper rescheduling of the work using transportation techniques was necessary. On an average, it was found that 4 trips can be made by each truck per day. This way each garbage container could be cleaned once in 4 days. But the morale of the workers was poor because of the nature of work at the garbage site. An alternative method for using "fork lift" type machinery to lift and empty the garbage container is suggested to save manual labour entirely. Further, incentive by way of extra payment and merit certificates for the extra work done properly within the allotted time were suggested. A reward oriented suggestions scheme for improvement also can provide additional incentive. An auditing committee of citizens, Health Officer, Sanitary Inspector and Union Leader has to be instituted for constantly monitoring the work.

REVIEW QUESTIONS

Q.1. What is Systems Analysis ?

Q.2. Discuss the role of a Systems Analyst in designing and implementing information system.

Q.3. A Systems Analyst is a change agent, motivator, an organizer, an architect and an intelligent sales person. Elucidate.

Q.4. What are the qualities and qualifications expected of a Systems Analyst ?

Q.5. Distinguish between system approach and system analysis.

Q.6. "The concept of Systems Analysis existed in olden days. But Systems Analysis as a field of study is a contribution of this century". Discuss.