

APPENDIX

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MIS Development

Ackoff (1)

1. Analyze the decision system
2. Analyze the information requirements
3. Aggregate decisions with the same information requirements
4. Design procedure for information processing
5. Design for control of the control system

Barnett (2)

1. Design & installation committee—appoint members
2. Appoint MIS steering Committee
3. Establish policies & decision rules
4. Prepare preliminary installation plan
5. Prepare detailed systems design specifications
6. Prepare final installation plans and schedules
7. Program (software)
8. Write procedures
9. Train

Blumenthal (3)

1. Preliminary analysis
2. Feasibility assessment
3. Management consideration
4. Systems implementation and control
 - a. General: Project planning and control
 - b. Phase 1: Completion of functional requirements
 - c. Phase 2: Preparation of system specifications
 - d. Phase 3: Programming and testing
 - e. Phase 4: Conversion and cutover (to full operation)
5. Data processing organization activities
6. Performance evaluation

Chorafas (4)

1. Application study phase
2. Requirements determination phase
3. System design phase
4. System evaluation phase

Ellis (5)

1. Mission objective
2. Mission design
3. Requirements analysis
4. system specification
5. Capabilities analysis
6. System design
7. Fine structure design

Feigenbaum (6)

1. System analysis—search for needs and opportunities
2. Systems programming—establish operation objectives
3. Systems design
4. System hardware and software
5. Systems installation and checkout
6. Systems service

Fisher (7)

1. Identification of problem
2. Description of the problem
3. Design of the system to solve the problem
4. Programming the system
5. Implementation of the system
6. Support of the system

Glans (8)

- 1. Study and design**
 - a. Problem recognition
 - b. Determination of objectives
 - c. Study present system
 - d. Determine system requirements
 - e. Design new system
 - f. Propose solution
- 2. Implement and install**
 - a. Detail system design
 - b. File design
 - c. Develop test criteria and data
 - d. System test
 - e. Conversion
- 3. Operate, Evaluate, and Modify**
 - a. operation
 - b. Efficiency analysis
 - c. System Modification and maintenance

Heany (9)

1. Develop or refine an information requirement
2. Develop gross system concepts
3. Obtain approval
4. Detail the design
5. Test
6. Implement
7. Document
8. Evaluate

Hopeman (10)**System Conceptualization**

1. Evaluate the problem and state objectives
2. Define the environmental set
3. Define the system encompassing the basic transformation processes associated with the system
4. Define the subsystems

Model construction and Simulation

5. Apply appropriate techniques to optimize the subsystems
6. Test subsystem models
7. Link subsystems to form the system
8. Apply appropriate techniques to optimize the system
9. Test the system model
10. Modify the model for environmental influence

Documentation

11. Document logic and state parameters within which the dynamic system is reliable and valid

Hopkins (11)

1. Discovery and definition of functional objectives
2. Definition of inputs, outputs, boundaries
3. Derive conceptual requirements
4. Derive specific requirements
5. Partition into subsystems
6. Develop quantitative specs
7. Build model and test

Kast (12)

1. Conceptual (recognition of need)
2. Definition (of problem and set of requirements)
3. Acquisition (analysis, search, synthesis)
4. Operatinal
5. Obsolescence

Optner (13)

1. Analyze the present system
2. Develop a conceptual model
3. Test the model
4. Propose a new system
5. Pilot installation of the new system
6. Full installation of the new system

Salzer (14)

1. Define the problem
2. Visualize the bigger framework
3. Define the subsystems
4. Analyze the subsystems
5. Study the interrelationship
6. Decide the implementation sequence
7. Design the subsystems
8. Reexamine the system requirements
9. Feed back the design results
10. Continue the design cycle

Thomo (15)

1. Policy definition cycle—select policy & brand objectives
2. Mission definition cycle—select missions, requirements, timing
3. System definition cycle—select system, elements & requirements
4. System elements definition cycle—system element design approach development, requirements
5. Implementation methods cycle—select implementation methods

Wilson (16)**Preliminary Design Phase**

1. Conceive and state problem
2. Prepare specifications
3. Prepare file (of information about available resources)

Feasibility Established

4. Synthesize—i.e. determine feasibility
5. Analysis—study each subsystem and system characteristic and economics to choose among alternatives

Final Design Phase

6. Decide on best alternatives
7. Define
8. Check

Young (17)

1. Problem raising
2. Problem investigation
3. Search for solutions
4. Evaluation and selection of solution
5. Consensus
6. Authorization
7. Implementation
8. Direction
9. Audit

- 1-KNOWLEDGE
- 2-UNDERSTANDING
- 3-SKILL IN APPLICATION
- 4-ANALYSIS AND EVALUATION
- 5-SYNTHESIS

TOP OPERATING MIS SYSTEMS SYSTEM
 MANAGERS MANAGERS MANAGERS DESIGNERS COMPUTER
 PROGRAMMERS

ANALYSIS SYNTHESIS AND DESIGN CONCEPTS

<p>Problem Solving The theory and practice of logic, decision making and creative thinking. The use of these and other problem-solving principles in the analysis and design of systems.</p> <p>Organization Principles Classical and contemporary principles of organization design and analysis. An understanding of the structure, design centers, information flow and other organizational considerations in systems design.</p> <p>Management The basic functions of management, with special emphasis on planning and controlling through information systems. Consideration and understanding of facilitating the management process with systems.</p> <p>Systems Planning Determining systems objectives and planning time, cost and resource allocations. Design proposals. PERT/CPM input/output considerations.</p> <p>Systems Theory Theory of information systems operation and design. Control theory. Integrated and total systems concepts. Planning and control through information feedback systems.</p> <p>Systems Evaluation Measuring efficiency against goals. Input/output considerations.</p> <p>Human Interaction In System Gaining acceptance and "selling" ADP. The impact of automation on personnel. Getting cooperation. Interpersonal relationships. Applied psychology.</p> <p>Quantitative Techniques In Systems Design Application of operations research and other management science techniques. Formulation of decision rules. Simulation and modeling.</p>	<p>5</p> <p></p> <p></p> <p>2</p> <p></p> <p>2</p> <p>4</p> <p>2</p> <p>2</p> <p>4</p> <p>1</p> <p>2</p> <p>3</p>	<p>5</p> <p>2</p> <p>2</p> <p>4</p> <p></p> <p>2</p> <p>2</p> <p></p> <p>4</p> <p>2</p> <p>1</p>	<p>5</p> <p>2</p> <p>2</p> <p>5</p> <p>5</p> <p>4</p> <p>3</p> <p>2</p>	<p>5</p> <p>2</p> <p>2</p> <p>5</p> <p>5</p> <p>4</p> <p>2</p> <p>3</p>	<p>3</p> <p></p> <p></p> <p>1</p> <p></p> <p>1</p> <p></p> <p>3</p>
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ANALYSIS AND DESIGN TECHNIQUES					
Systems Planning		2	3	5	2
Network analysis technique for logical structuring of planning.					
Preliminary systems survey.					
The feasibility study.					
The cost evaluation and analysis.					
Analysis of time requirements.					
Planning usual elements of the system.					
Systems Analysis and Design		2	4	5	1
Analytical technique and documentation (work measurement, flow charting, form design, source data automation, etc. Input-output alternatives. Communications, Inter-viewing, and selling. Principles of systems design.					
Implementation and Follow-up		5	5	2	1
Planning site preparation, personnel, organization, other consideration.					
Training the user.					
Evaluation and audit.					
COMPUTER CONCEPT AND CAPABILITIES					
I Hardware Characteristics	1	1	2	2	5
Mainframe capability, peripheral equipment remotes and linkage input-output devices, time-sharing, on-line systems, etc.					
I Software	1	2	4	4	5
Languages and compiler options (FORTRAN, COBOL, ALGOL, BASIC, TELCOMP, QUIKTRAN, CAL) Standard programs and models. systems applications.					
ADDITIONAL SKILL REQUIREMENTS					
Programming			1	2	5
Quantitative Techniques					
Management science techniques in systems design.			2	3	4
I Communications		5	5	3	3
Graphics and visual presentations.					
The oral and written staff report.					

Table 1 – Training Programs Summary

Quantity and Quality Dimension of Information Produced By Computer-Based systems		
DIMENSION	USER ASSESSMENT	
Improvement in job performance by having more information	Very much improvement	1.7 %
	Considerable improvement	33.9
	Some improvement	45.8
	Very little improvement	18.6
	No improvement	0
Improvement in job performance by having better information	Very much improvement	10.2
	Considerable improvement	45.8
	Some improvement	30.5
	Very little improvement	11.9
	No improvement	1.6
Improvement information support by having more or better information	More information	22.4
	Better information	77.6

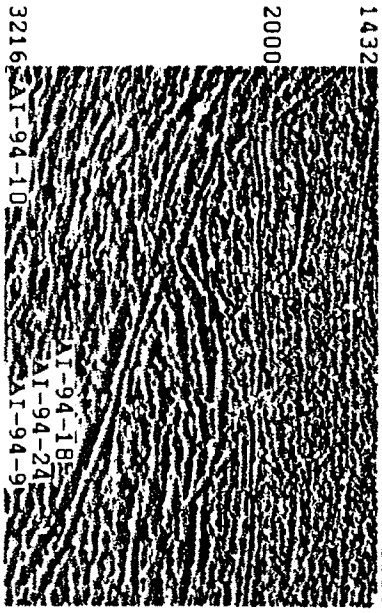
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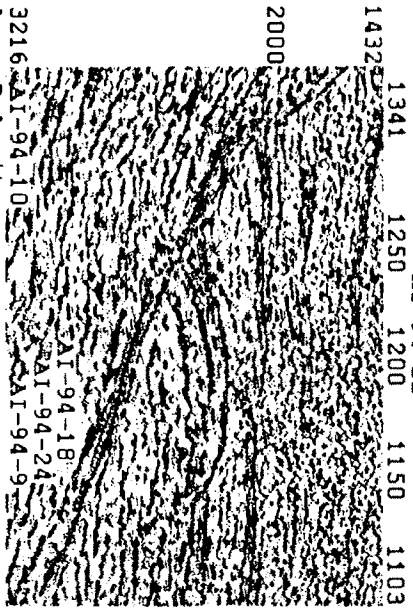


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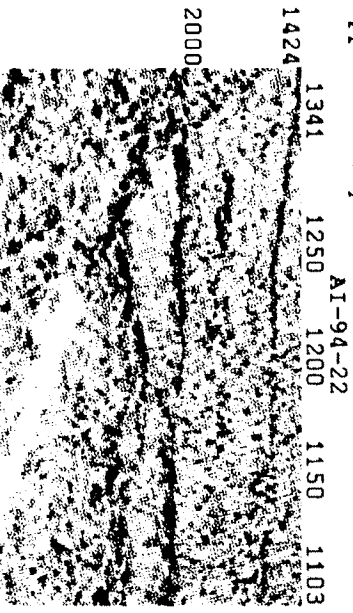


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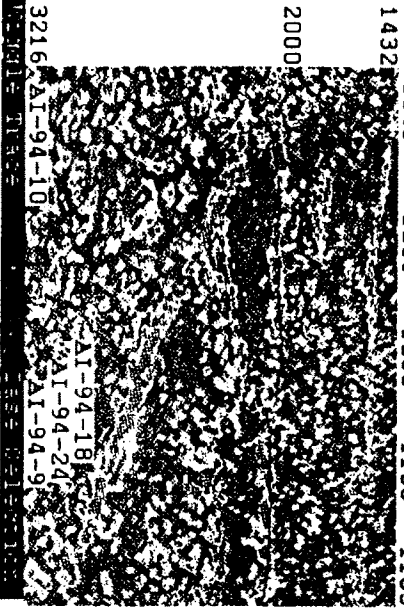


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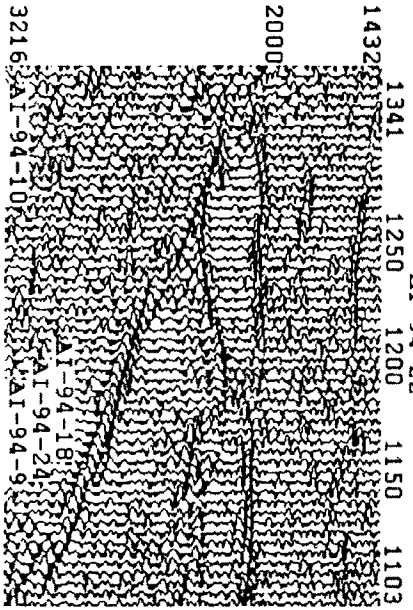


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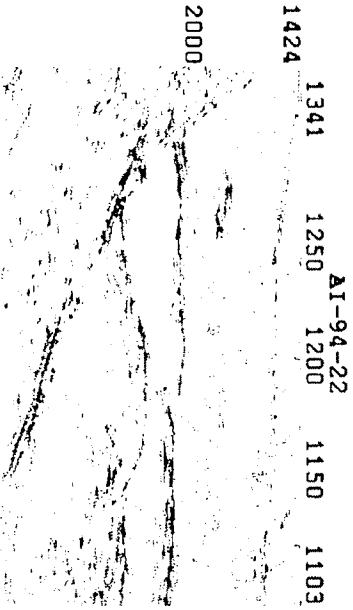


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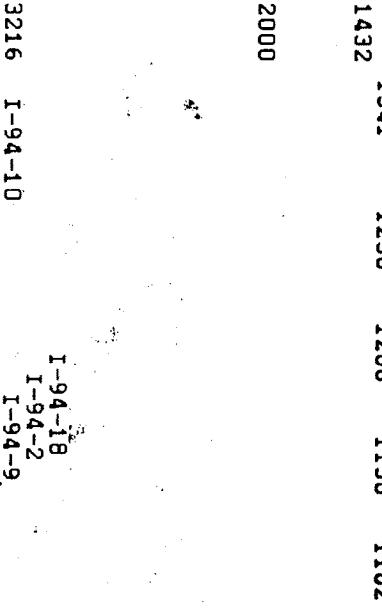


Inst Frequency

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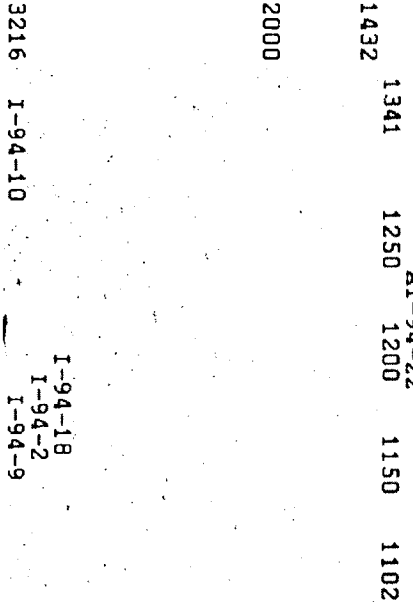


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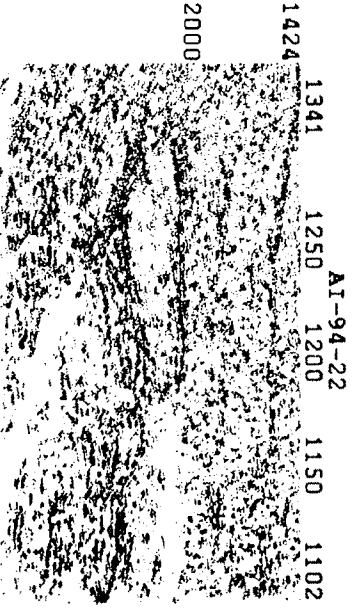


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Methods for Development of Systems Projects	
SYSTEM DEVELOPMENT METHODOLOGY	PERCENTAGE
System are developed by joint project teams comprised of users and systems analysts	67.8 %
Systems analysts develop information systems that meet corporate needs and users determine how to best make use of them	1.7
Users give systems requirements to the analysts who in turn design the necessary systems	22.0
System analysts suggest particular systems to the users who can accept or reject them	1.7
Other	6.8

Most Common Causes When Desired Information is Not Available			
Factor	Most Common Cause	Second Most Common Cause	Next Most Common Cause
Insufficient time to obtain information	38.3 %	22.0 %	14.2 %
Information available, but wrong format	28.3	28.8	14.2
Information not reliable enough	3.3	10.2	12.5
Information not up-to-date enough	8.3	11.9	14.3
Too expensive to obtain	1.7	13.5	19.6
Information not available from any known source	16.7	5.0	12.5
Information available, but too inaccurate to use	1.7	6.8	5.4
Other	1.7	1.7	6.7

Characteristics of Information Produced By Computer – Based Systems						
INFORMATION CHARACTERISTIC	CURRENT ASSESSMENT OF INFORMATION PRODUCED	NEED FOR IMPROVEMENT	IMPORTANCE OF HAVING NEEDED IMPROVEMENT			
ACCURACY OF INFORMATION	Excellent	11.9 %	Much improvement in accuracy	8.5 %	Very High	23.7 %
	Good	62.7	Some improvement in accuracy	49.1	High	49.1
	Poor	23.7	Little improvement in accuracy	37.3	Moderate	20.3
	Very Poor	1.7	No improvement in accuracy	5.1	Low	11.9
PRECISION OF INFORMATION	Excellent	5.2	Much improvement in precision	6.8	Very High	18.6
	Good	63.8	Some improvement in precision	49.1	High	37.3
	Poor	20.7	Little improvement in precision	42.3	Moderate	32.3
	Very Poor	8.6	No improvement in precision	6.8	Low	11.9
REPETITIVENESS OF INFORMATION	0 – 20%	20.0	Much more repetitive information	1.7	Very High	3.6
	21 – 40	22.4	More repetitive information	6.9	High	27.3
	41 – 60	24.1	Same amt. of repetitive information	62.1	Moderate	45.5
	61 – 80	22.4	Less repetitive information	25.9	Low	23.6
	81 – 100	12.1	Much less repetitive information	3.4		
RELEVANCY OF INFORMATION	0 – 20%	0.0	Much more relevant information	1.8	Very High	24.5
	21 – 40	5.4	More relevant information	67.9	High	47.2
	41 – 60	19.6	Same amt. of relevant information	30.3	Moderate	17.0
	61 – 80	35.7	Less relevant information	0.0	Low	11.3
	81 – 100	39.3	Much less relevant information	0.0		

TRANSACTIONAL ANALYSIS FOR EDP-PROFESSIONALS

VIPUL DESAI*

1.0 INTRODUCTION :

Computer is now only a tool for R&D functions but, at large it has also established its importance and inevitability over industrial organisations. EDP man has grown up to the level of Professional - in 'market terminology'. Years of experience has contributed enough skill and confidence over the technology but has taught us very little about the human aspect to achieve harmonious functional success.

Human and Conflict are corelated and coexisting words. And only awareness and understanding can help an individual to come out from such conflict or in acquiring command over the problems arising due to human conflict.

'Transactional Analysis' is a technique which defines this Human Conflict as Personality Conflict and offers analytical approach to our problems explaining various aspect of personality in a greater depth. Although I shall be discussing the general aspect of TA, the scope of the paper is restricted to EDP-Professionals only.

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1.1 WHAT IS TA?

Transactional Analysis offers a Behavioural Model of personality. According to this model, an individual's personality consist of multiple nature. This multiple nature is based on the observations that a person is behaving differently at different time according to the varying condition and environment. The careful observation has discovered that there are three basic ways that an individual may exist at any moment of time. These three divisions of human personality are known as Ego-States. An ego state includes the way a person is thinking, feeling and behaving at any one point of time. The three ego states available to a person are called :the PARENT, the ADULT and the CHILD. Regardless of the age, a person exists in one of the three ego states.

1.2 CLASSIFICATION OF PAC :

The three ego states the PARENT, the ADULT and the CHILD (PAC) are defined depending on the pattern of behaviour. PAC represents the different part of an individual's personality. The three states are :

1. PARENT :

The part of the personality dealing with values, opinions and suggestions. It is like real parent an authority figure; sometimes the nourishing and loving while at other times critical, unfair or prejudiced.

2. ADULT :

The rational part of the personality. It is like a computer : logical and, mostly, processing data remaining away from feelings and emotional part of the personality.

3. CHILD :

This is an emotional part of the personality. Children can be free child - Spontaneous or Creative, OR like Adaptive Child - rebellious or submissive.

The three ego states are referred to as the 'Structure of the personality'.

1.3 CONCEPT OF TRANSACTIONS :

When two people get together and talk - it is transaction. As discussed above, personality is split up in three ego states (PAC). When the transaction takes place, it is always between any one ego-state of one individual and any ego-state of another individual.

All transactions can be classified as complementary, crossed, or ulterior. We shall refer complementary and crossed transactions for the scope of this paper.

A COMPLEMENTARY transaction occurs when a message sent from a specific ego-state gets the predicted response from a specific ego-state in the other person. It occurs between any two ego-states (Refer Appendix Figure (a)).

EXAMPLE :

1. Person A : What is the monthly computer requirement for this system?
2. Person B : About 50 hours, to start with.

A CROSSED transaction occurs when an unexpected response is obtained and an inappropriate ego-state is activated in the other person. Here the lines of transacting between the people are crossed (Refer Appendix Figure (b)).

EXAMPLE :

1. User : I need 20 copies of this report tomorrow for the auditors, can you get them for me?
2. EDP Officer : My boys will take care of your needs. But you always come at the last moment.

Referring Figure (a) you will find that transactions take place between A to A, while in example of crossed transactions, it is between A to A and P to C, and

transacting lines are crossed.

2.0 WHY CONFLICT - TA CAN ANSWER YOU :

You are an individual, your User is also an individual then why the conflict is observed very often? Dr. Barry Render and Dr. Maurice Villere have given three basic reasons for the origin of conflict occurring between EDP-Professional and their User. They are :

(a) Disciplinary Difference :

EDP-man and User-man are from different functional areas. They speak different language and use technical "Jargons" to confuse each other.

(b) Lack of Proper Recognition :

There are very few organisations in which EDP-man has acquired proper recognition from the top management. This leads to ill-response from the other departments.

(c) Human Nature :

By nature, human has developed a habit of playing games. This game could be the outcome of boredom, lack of proper recognition, lack of appreciation etc.

Analysing the above three basic roots of occurring conflicts; (a) is the problem due to improper media of communication while (b) & (c) are entirely the problems of personality conflict.

All the three problems can be resolved by better understanding of `Why it exists.

2.1 LIFE POSITION IN TA :

Origin of your behaviour, thinking and characteristics depend on what TA defines as your LIFE POSITION. TA defines four different profiles for the life position of an individual.

1. I am OK, You are OK.
2. I am OK, You are not OK.
3. I am not OK, You are OK.
4. I am not OK, You are not OK.

The life position is defined based on the acceptance of the values of self and that of others.

We, as an individual, fall under one of the above life style position. The position (1) is the real position which one should try to seek if he is falling in other positions. This position shows the Adult ego stage of an individual - rational and logical.

Positions (2), (3) & (4) will tend to create the conflict as the values and opinions of each other are not accepted mutually. Suppose, if your user is falling in `I am OK You are not OK' position he would be having his set ideas and pattern of thinking and it would be difficult for you to get him convinced.

Instead the user, if you are in the same position, the situation will remain the same.

One can change his life position if he knows his own personality. Once your own approach is 'I am OK you are OK' the probability of conflict is eliminated to a greater extent.

2.2 LET OTHER SAY WHAT YOU ARE :

Johari's Window :

The fifty percent of your personality is what people say 'you have'. And rest is what you know about your personality.

Johari's window is the concept which explains the individual's personality saying that it is like a window with four partitions. This concept is also known as Johari's awareness model.

Please refer Figure-3 in Appendix.

It is very clear that you need to reduce the hidden or dark side of your personality which is possible by getting proper feed back from the people. The technique like Sensitivity Analysis could be used to know 'what others know about you'.

While to know about the 'unknown' perceptual portion of your personality the self-search techniques like TA or TM (Transcendental Meditation) may be helpful.

3.0 UNDERSTANDING IS NOT UNDERSTANDING :

What you call an EDP-Professional or User, he is an individual and every individual has a definite role to play. Every individual behaves in a particular fashion and how he behaves that depends upon a role or act he has to play. This role is defined as 'SCRIPT' in TA. According to the function, individual has the script. Individual behaves as per the script given to him. Suppose, today, you are EDP-man and you have a script to perform your function. But, tomorrow, if you are transferred to some user department where you have to get services from the EDP-man then your role - your script - would be different. In this case you would be acting as User and follow his script showing all the characteristics of a user which, once as a EDP-man, you might be criticising.

3.1 UNDERSTANDING YOUR USER :

EDP Users are broadly classified in the following categories :

EVERYDAY USER :

This type of user is highly receptive and has developed the appreciation for the EDP-function. He acts in

positive way for any function which could be new system development, data requirement or changes etc. Mostly you may find him residing in 'I am OK You are OK' life position.

GOGO USER :

This type of user shows inertia in extending response for anything. You have to push him everytime to move him. He may not take any initiative but will not say 'NO' to you for any help or demand. He feels himself independent of the activities going around him.

JACK USER :

This type of user is like a slave. He may do his job according to your requirement and he may do your job also. He may give plus-response but never interact. So, you may not obtain any guidance from the user about his functional areas.

CLOSE MIND USER :

This type of user is with set ideas and preconceived pattern of thinking. He will over emphasise his own ideas and will not respond to any deviation. Till you agree to his set ideas and line of thinking you will continue to get response, but when you differ you will be criticised leading to the task failure. In TA definition, he is all the time in 'I am OK You are not OK' position.

`NEVER NO' USER :

This class of user is tough in all the respect. His thinking, behaviour and action parts are different and independent resulting in misleading personality. He will never say `NO' to anybody for anything but he is ready with some excuses using but's and if's. Ultimately he acts as per his plan. TA defines this negative technique as "Game" which is spread like a vicious circle and exists all over in any hierarchical structure at all the levels.

3.2 KNOW WHERE YOU ARE :

Basically - as an EDP Professional - your function is to render the required services to the user. The purpose of the system may be accounting or information or control but the function remains `services'. However, by analysing the various strata of EDP - Professional, three classes are observed.

1. ACTION Oriented EDP-man who is aware of his function and acts positively.
2. NO ACTION Oriented EDP-man always avoids his job, does not take any initiative and offers no response.
3. REACTION Oriented EDP-man who is complex in behaviour. He may avoid the work but pretend such that will look as if the user is not interested.

Give a thought and see that you are placed with the class of people who are Adult in their behaviour, understanding and accept their function with awareness.

4.0 TOWARDS THE BRIGHTER DAYS :

Apart from the basic concept of TA I discussed, the endangered points and probable areas of conflict. But no technique can reap a better result unless it is put into practice. TA gives understanding but practice of TA would create awareness. What is more needed is not understanding but awareness; the awareness that keeps you awake; the awareness that keeps you conscious; the awareness which keeps you adult in every walk of your life.

4.1 BEHAVE AND HAVE :

TA explains how important is our behaviour is as behaviour is also a transaction. Any time one person recognizing another person is a transaction which could be action or behaviour or spoken words. The transaction which earns a positive response is called a Positive Stroke in TA and similarly, passing a transaction which yields a negative response is called a Negative Stroke.

If you analyse at the end of the day you may be passing on many positive and negative strokes. To improve your

behaviour you have to screen your negative strokes by which you will not receive any misgiving from the people. And put some efforts and make a habit of giving positive strokes to others. This will not only bring the response of the people but will create your overall positive image which can lead you to smoother path all throughout.

4.2 **GAME IS NO GUTS :**

According to TA, a game is an implicit interactional strategy where the outcome is negative. In a game a person appears to be doing something agreeable and profitable on the surface but the actual motive is negative.

In an organisation, where the roots of game has penetrated the base of the ethical behaviour, one has to be aware that he is not entering in it. Remember, one alone can not play the Game. Keep away yourself and you are safe because in the Game, at the end, nobody wins.

GO AND GET SUCCESS ;

Lastly let us remember, that EDP is an interdependent functional area; at times, more dependent on man than a machine. And Peter Drucker says 'Where there is a man, there is a problem'.

TA has translated an amplified noise of amature behaviour conflict and exposes the true personality of an individual. With TA you have known the path which leads to the success. Key is already with you. You have to just go and get success.

ACKNOWLEDGEMENT :

I express my sincere gratitude to Prof. S. R. Desai, Chief MTI SAIL Ranchi, who inspired me to undertake in-depth study of T.A.

I am grateful to Shri. J. D. Jansari, Manager, Management Service Department, IPCL, Baroda for encouraging me to write this paper.

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DATA FOR EDP-PROFESSIONAL

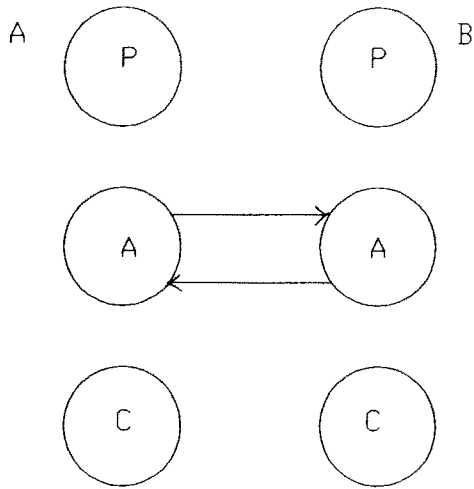


FIG 1

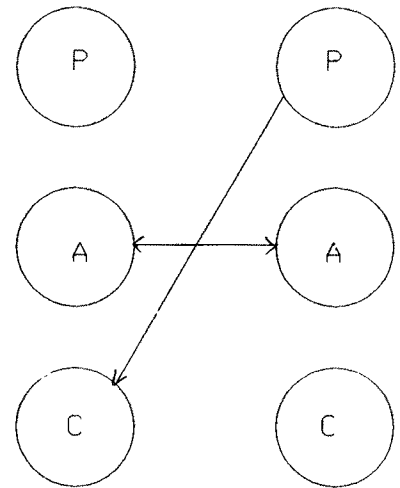


FIG 2

JOHARI'S WINDOW

OTHERS/SELF Information known to self Information known to self

Information known to others	OPEN	DARK
Information known to self	HIDDEN hidd	UNKNOWN

FIG. 3

UNTOLD ASPECTS OF COMPUTER EDUCATION

The Formal Computer education in the country has passed almost two decades and reached to a level where hardly there could be any aspect of Computer Science which has remained uncovered in University Syllabus. With extended theoretical concepts and extensive hands-on training it is presumed that the standard of computer education is improving. May be that the standard has improved but when these university products are matched with the market demands, the wider disparity is observed. While reviewing the causes of such disparity it seems to me that probably there are few aspects which could be discussed with the faculties so as to ultimately pass it to the students. I am sure that the implementation of these salient aspects would show the mark of definite improvements in the subsequent batches of the students.

I would like to focus the discussion on the following three aspects :-

- (1) Projection of Market Scenario;
- (2) Behavioural cross-section of Computer User; and
- (3) Close interaction of Institutes & Industry.

The ultimate aim of any institute or university would be to produce the students who are equipped enough to get the suitable assignment outside. With reference to the study of computer science or any area of computer science, I have always felt that the students are deriving a very rosy picture about their future area of work and the demand for the employment. Working in the air conditioned computer

centre and learning the programming and systems assuming the ideal environment gives the rosy picture of the bitter reality that they have to face while getting the job and working on the job. The main reason is the wider gap between what the students learn and what are the expectations of the employer from the students. Whenever I have come across any institute this has been my observation that no institute has so far taken care of these dimensions and worked out the scheme of giving the proper orientation to make the students aware about the area where they have to get themselves prepared before they come out of the institute for getting the opportunity outside. If the students are made aware of the aspects related to :

- their strength and weaknesses;
- shortcoming of the education system and special requirement to meet the expectations of the employer;
- the realistic picture of the environment in which they have to work.

These would certainly bridge the gap between their academic background and the market reality.

The second aspect which I would like to elaborate is the pattern of computer users. Since the success of any system design depends on the implementation of system and for the successful implementation of the system, in Indian environment, one has to sell the system in order to implement. Looking to this aspect I tried to analyse various types of users that one comes across and have tried to

classify the users in five broad categories. This classification is made based on their behavioural cross section. Once you are able to understand the type of the user, probably the solution is not difficult. When you understand the type of the user you must be clear about your position as regards your behavioural aspect. I suggest that to develop the integrated personality of the student, they must be given proper appraisal about their own behavioural position and they must be given the required orientation of the said categories of users' strata with whom he has to deal on a common platform. The student should be made clear about the fundamental aspects like :

- Understanding is not under standing;
- Understand your user;
- Know where you are;
- Behave and have.

The third dimension of my discussion, I would like to elaborate on, is the need of close interaction between the university/institute and industry. No doubt, that some of the premier institutes like IIMs have already adopted such approach, however, most of the universities/institutes are not aligned with any industrial environment and therefore the gap between the education and application is widening. Because of the various operational constraints the exchange of people between industry and university may not be possible, however, an institute can always take the help of industries for the application related study and at the same time industry must take the support of universities/institutes for organising the refresher courses

imparting the fundamental concept and the development in the field for their professions. This would also help the university to prepare their students with more realistic background of application and, at other end, industry would appreciate the background of the students since they are aware of details of the syllabus which the students have undergone. At present, students are given the assignment of project work. They go to industry, spend sometime and prepare some project work. In the said process major time is spent in getting the clarity of the application area and thereafter, if there is no sufficient time available, the project report is somehow managed in order to complete the work in a specified duration. The outcome of such exercise would become more fruitful if the students are given proper blending on the application areas prior to their going on project assignment. Otherwise what is called a systems project is merely turns out to be the programming exercise since these students are not capable to undertake any systems analysis and design job. I am not quite sure myself whether such need of close interaction between industry and institute has been felt by the institute also but I am hopeful that such close linking operation would churn out more fruitful product and encouraging results.

I have touched upon three aspects which are not normally covered or taken care during the process of formal computer education. This may not be an exhaustive list of uncovered aspects but in my opinion, the above dimensions are the

fundamental requirements whether we accept or not. The forum of academicians are supposed to be more receptive and therefore the initiation is possible only from the end of the university/institute rather than industry.

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