

IMPACT OF COMPUTERS ON PEOPLE IN NON-IT INDUSTRIES

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P *RELUDE*

THIS paper is based on a survey-based research on how the computer users in the non-IT industries feel about computerization in their work places. It will help one to find out the needs in the process of socio-technical change involving computers. This also could help one understand the extent of use of computers in a cross section of businesses at different levels in the hierarchy and the various functions like marketing, finance, personnel, EDP, production etc. It explains the relationship between demographic variables had its impact on the adaptation to computers. An attempt is made to highlight the problems encountered while using computers. The rationale behind people using/not using computers too is analyzed.

Computers have come to 'stay' was a widely prevalent cliché. Presently people wonder whether the computers have come to 'rule'. Hence much is the grip of computer-based technology in all the aspects of the life. Manufacturing, banking, medicine, education, research, agriculture, administration, even entertainment industry is increasingly being computerized.

Recently, many experts have become sceptical about the desirability or effectiveness of computers. In many instances billions of dollars are reported swindled with the aid of or due to computers. Sudden loss of data led to catastrophic results and viruses have led to collapse of the functioning of giant organizations. Industrial espionage has become more dangerous. Massive investments are made in computers and companies went nowhere half way through expensive computer system installation. Companies had to drop the whole plan when the system was found to be a misfit. Rash implementations have resulted in system collapses.

Managements expect a world out of computerization. They deem it a magic wand that would provide overnight solutions to all their problems. They feel compelled to computerize just to be ahead – be in vogue or for face value. This attitude results in installation of a system without proper need analysis/half – baked and incompetent efforts. ERP, the latest corporate gospel is bringing most successful organizations under its clutches. Many of them loose the enterprise in the ERP system instead of using it as an enabling process.

HRD has taken a back seat in this rush to computerize. Most organizations buy the hardware and the software and just expect the previously manually operating personnel to jump over to a totally alien system. The outcome of such an event is the use of computers being very limited. For example, a typist uses it as a modern typewriter, accountant uses it for storage and retrieval of data, a shopkeeper uses it as a billing machine. However, almost all of them use it to play games. They do not even know, let alone use the various other facilities inherent in the computers.

The developments in the hardware and software have definitely been tremendous. No doubt, there has also been a surge in the number of computer hardware and software experts. But, where do this humanware go? They flock to the IT industry, which alone has tremendous capacity to pay.

The user side is sadly lacking in training or awareness. Unless and until these people are well trained, the fantastic computing capabilities boasted will be of no avail.

The non-IT companies have stretched their finances enormously in buying the most sophisticated IT tools. Now it is time for them to take a breather, look back at their actions of the past, and measure the results or returns on investments. It is said that the only industry that has financially gained due to IT has been the IT industry. IT, which was to be a means to the others, seems to have become an end in itself.

The major tribulations of computerization are as follows:

1. Losing autonomy in a networking atmosphere.
2. Too much of information leading to doubts and confusion.
3. Too high structuring leading to rigidity.
4. Isolation and reduction of the human touch.
5. The knows getting the better of the know-nots
6. High dependence on electronic devices and automated machines.
7. Boredom when the work becomes repetitive and meaningless.
8. Frustration caused by inability to master the system.
9. Physical problems relating to hands, eyes, etc.
10. Virus infections leading to loss of data.
11. Undermining the human instinct due to accuracy in available DSS.
12. Misinformation caused deliberately by miscreants or fed by mistake at entry level and sophisticated crimes.

The research measures the impact of computers based on the 14 parametric dimensions evolved by compressing 69 variables used in the research instrument to arrive at basically 3 types of adaptation to this phenomenon. An attempt is also being made to decipher some kind of strategy that could be adopted by industries to meet the varying needs of these computer users in the non IT industry.

The following case throws light on the background in which the study is set up - a non-IT industry facing the prospect of digitization without readiness in expertise. *Senior executives at Armour Coat Insurance knew that they had to become web-savvy to compete* (Coutu, 2000). *Yet they lacked the confidence-and the humility- to be mentored by 20-somethings*. This classic case describes how veteran and skilled non-IT personnel of a company feel belittled by the yuppies who tried to tell them how to go about their work. The upstarts, the green horns and the smart alecks were common names used for these new entrants who had the onus of making them IT savvy. They hated the TINA (*There Is No Alternative*) factor attached to computerisation.

In some instances going online is just a formality. For example, a web page of our government consisting of 1 single page and no hyperlinks states, *“We have transformed from being a paper to electronic government and as of now we are the most computerised Ministry in the entire Public Sector. We have a number of ongoing initiatives that are aimed at advancing user skills in the computer. The Principal Secretary is in the frontline on these developments. Fifteen computers currently serve the Department of Administration... - A very pompous and typically officious sounding message giving no useful information to the browser regarding the portfolio of the department or the status of appeals pending before it.*

The next situation describes a disastrous effort of trying to computerise an Indian University's library. *The officials at the University had initiated a project to computerise its library in 1997. Today, the project remains a distant dream. So far, the library authorities have compiled just 25,000 books. Call it a lethargic nature of the authorities or bureaucratic hassles, the Library, which has one of the largest collections of books in Asia, is yet to enter into computer age. The vice-chancellor said, “The reason behind non-completion of this project is lack of responsible behaviour of the in-charge official”.* Meanwhile sources at the library say that no one is interested in shouldering responsibility of computerising the library. The library authorities have now given the compilation job to a private agency (incity@ahmedabad.com).

“The main challenge for computerisation in banks, particularly in cooperative banks, would be the need to re-train and re-orient staff on a continuous basis on the technology and tools for better decision-making,” (Businessline, 2001). There is need to ensure adequate and reliable infrastructure, including power and telecommunications.

Unfortunately, many managers and organizations do not understand the long term and ongoing nature of organisational development. Improvement efforts initiated with fanfare and not supplemented with training or adequate planning, are dropped shortly thereafter, merely to produce cynicism. *The Economist*, London aptly claims, “The average management fad like the average love affair goes through a fairly predictable cycle from infatuation to disillusionment”.

Strauss Mann, previously CIO at Xerox and the Pentagon challenges any ROI due to computers and flays “best practices” in IT as shams. He argues that the gains in revenue are due to outsourcing and not computerisation. He in fact condemns the machines as a source for down sizing and not value addition (Mann, 1997).

A research study was conducted with 50 top-level business executives of 30 SSIs and 20 medium and large-scale units. 29 of the former group and 9 of the latter did not use any kind of DSS. In fact 24 SSIs claimed that they were not even computerised (Existence, 1995).

In yet another study conducted at a public utility on effectiveness of MIS where 99 level 3 managers were covered, a disheartening finding was revealed. Keeping Timeliness, Relevance, Accuracy, Adequacy, Format Clarity, Explicitness, Exception based reporting and Avoidance of overloading as criteria, the consultant was not able to pin even one factor down as satisfactory in performance. He suggested a total revamp for effectiveness (Goyal, 2000).

Research Methodology

The research is exploratory in nature. It tries to analyse the behavioural and attitudinal impact of a massive and all pervasive technological change- namely, computerisation. Intrinsic impacts like changes in work styles and qualities as well as extraneous aspects like implications on health and future career prospects were studied. Attitudes were also measured using scaled statements both favourable and negative towards computerisation.

The Research Instrument

The first part of the instrument concentrated on the personal profile of the respondent. The profile included age, gender, educational qualifications, salary, department, position held, experience, number of years of computer usage at work, and the name and size of the organisation.

Initially, their work environments like extent of computerisation, hours spent at the computer, time of introduction, years/length of computer usage at work, ways in which they operate the computers (personally or through assistants), degree of computer literacy, the ways in which they had learnt their skills, - by reading, going to institutes, doing, observation, on-the-job, and hearsay were addressed.

The next group of statements derived the positive impact on productivity like saving time, costs, effort, increasing accuracy, independence, accessibility etc.

Subsequent questions measured the possibly negative attitudes- viz, whether computerisation had made work more tedious, unreliable or was against the trade unions, if it would lead to retrenchment, lacked adequate training or technical support system, was half-baked or needed further rectification.

The questions that followed incorporated the aspects of manpower- for computerisation and the technical support there on.

This was followed by a battery of questions regarding the types of help their respective organisations gave them to accustom them to computers. Then their computer environment was checked.

The status of irritants in the modern technology like virus, power cuts, fire, network failures and hang-ups were measured.

The final part of the instrument had a scaled inventory of the possible usages of computers or the specific jobs for which the respondent used the computers at work.

Statistical Methods Used

The whole questionnaire had used Likert's type of scaling. Consolidation and analysis were done on computer using SPSS. Factorisation was resorted to in order to summarize the data and determine the major dimensions that could simplify comparisons and arrive at variations between different sample groups. Based on the factors clustering could be done on the sample population. Pictographs were derived from tables for easy perception.

Respondents

The target included all segments of people. The only two requirements were that they should not be working for the IT sector but must be computer users, directly or indirectly. If a person worked for a non-IT company for IT departments, then he / she qualified as a target respondent. The samples were drawn from many places in the country. The industry-profile of the sample population was as under:

- **Private Manufacturing Sector:** They belonged to various hierarchies ranging from clerks to General managers and proprietors.
- **Banks and Insurance:** In Nationalised banks and Insurance companies, cadres starting from clerks to chief general managers were included.
- **Colleges and Universities** (Teaching and non-teaching): Lecturers, Readers, Professors, Deans, Registrars, Secretaries, PA's, Computer operators, Librarians and clerks were in this group.
- **Government:** Here the research considered the Police Dept., Telecom, Pollution Control Board, RTO, Income Tax, Railways, TWAD Board, and Ministries' staff.
- **Professionals and Service Providers:** Doctors, Architects, Lawyers, Chartered Accountants, Hotels, Hospitals, various service providers, super markets and the like comprised in this group.

Major Findings

The study resulted in 14 parameters of which 9 (*Driving Forces, Economies, Lone Applications, Learning, Organisational incentives, Enablers, Proximity, Team work, Net Applications*) had positive connotations and 5 (*Common Complaints, Implementation Lacunae, Apprehensions, Stumbling Blocks, Pastime*) negative implications.

Driving Forces

The positive views that might make it easier for the better adoption of computers at work are, Computers make work easier, accurate, increase quality, output, profitability, save time, access data, gain independence, reduce repeat work, integrate databases and the conviction that computerisation is for the better when compared to the manual system.

Economies

The belief that the usage of computers at work will lead to reduction in paper use and other costs.

Lone Applications

Stand-alone applications of computers for Word Processing, Presentations, Report Generation, Data Storage, Analysis and Decision-Making, Planning and Scheduling are measured. Word Processing among these is the most common, but is least fruitful. If a hierarchy was to be evolved among these usages, word processing will probably be in the lowest rung. Data storage and retrieval, including for accounting purposes ranks next with presentations and report generation following planning and scheduling in the hierarchy. The top most level of computer usage would be in analysis and decision making.

Learning

The various ways in which the respondents tried to enhance their computer knowledge/skills namely, reading, listening, observing, practicing, and going to school.

Common Complaints

Factors that keep people away from computers and might increase the drag in the process of change are—computers would cause losing of autonomy, boredom, isolation, delays, helplessness, and health problems.

Organisational incentives

It is in the interest of the management that computerisation takes place smoothly. To this end, they offer various kinds of incentives to the employees in the form of—orientation programmes, assurances, trainings, financial incentives, counselling, and consultations. This dimension tries to assess the amount of these incentives that the respondents have received so that they could better adapt to the system.

Enablers

Any change effort must have proper follow-up and technical support. In many cases the absence of these will be rather an undoing to all the efforts put in at the initial stages.

Proximity

This dimension includes the measurement of physical proximity to the machine that the respondents have at work. Extent of computer use at work, hours spent at the computer, amount of help taken from computers to perform their work, and extent of computerisation in their work environment are taken in to consideration.

Implementation lacunae

Many employees are under the impression that the change is not being implemented properly. Some feel that computerisation is incomplete, the work place needs more reorganization, there is insufficiency of investment, and wrong system choices were made. These impressions are consolidated in this factor.

Apprehensions

There are some die-hard opinions, which come in the way of computerisation. For example, Manual system is simpler and more reliable, work is more tedious with computers, there is lack of necessary training, computerisation will lead to unemployment and is against trade unions, and it is a threat and not a tool.

Stumbling blocks

The set of real problems that arise due to computerisation are covered in this factor. Viruses, power shut downs, network failures, Dead locks, fear of loss of data are inherent maladies for which proper safeguards have to be provided. The magnitude of these maladies experienced by the samples is exhibited as a whole in this compressed version.

Team work

Computerisation is a new phenomenon. People need time and help to get used to it. Many people, due to ego problems or poor organisational climate do not help each other in coping with this environment. As a team, an organisation can succeed better than working as individuals in a pack. Extent of assistance or help sought and achieved when handling computers have been clubbed together to evolve this dimension.

Pastime

It is common to hear about cases where the employee used the office resources for personal benefit. Not only the computer, but also the time for which the company is entitled too is wasted. This factor measures the extent of time wasted on computers by playing games and net surfing.

Net applications

Internet, email, CRM / bulk mail are all grouped separately from the applications due to their uniqueness in requiring networking environments. CRM is widely spoken about but not much practiced application.

Some of the respondents have replied affirmatively to this query even if they just used mail merge and snail mail. These could yield higher economies if properly used.

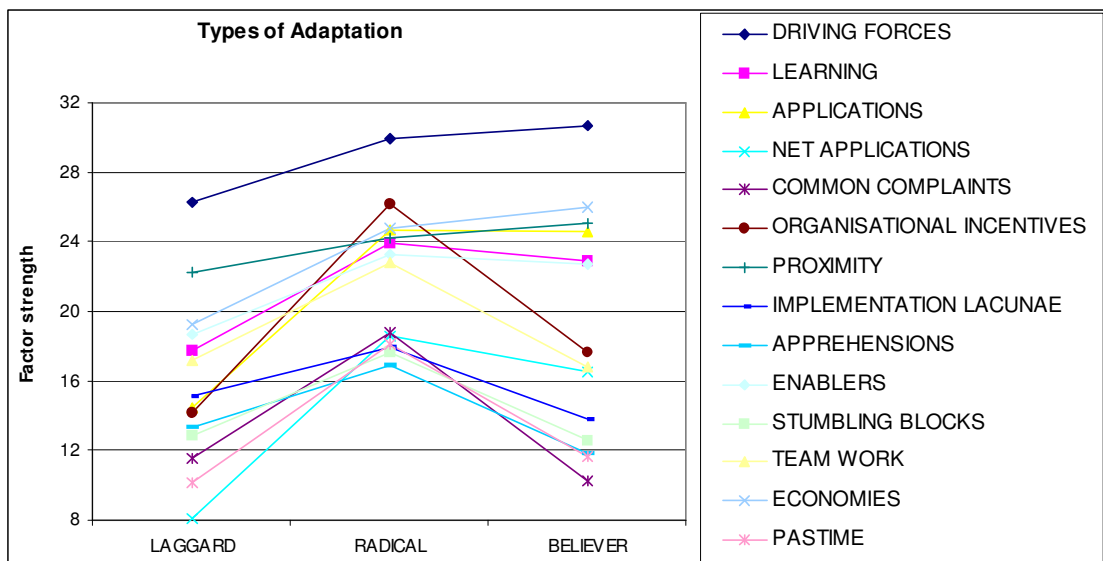
Types of adaptation

These 14 factors formed the basis for further analyses and interpretations. Anchoring on these 14 factors the samples studied could be clustered in to 3 groups which best explained their adaptations to computers.

These groups could be christened as:

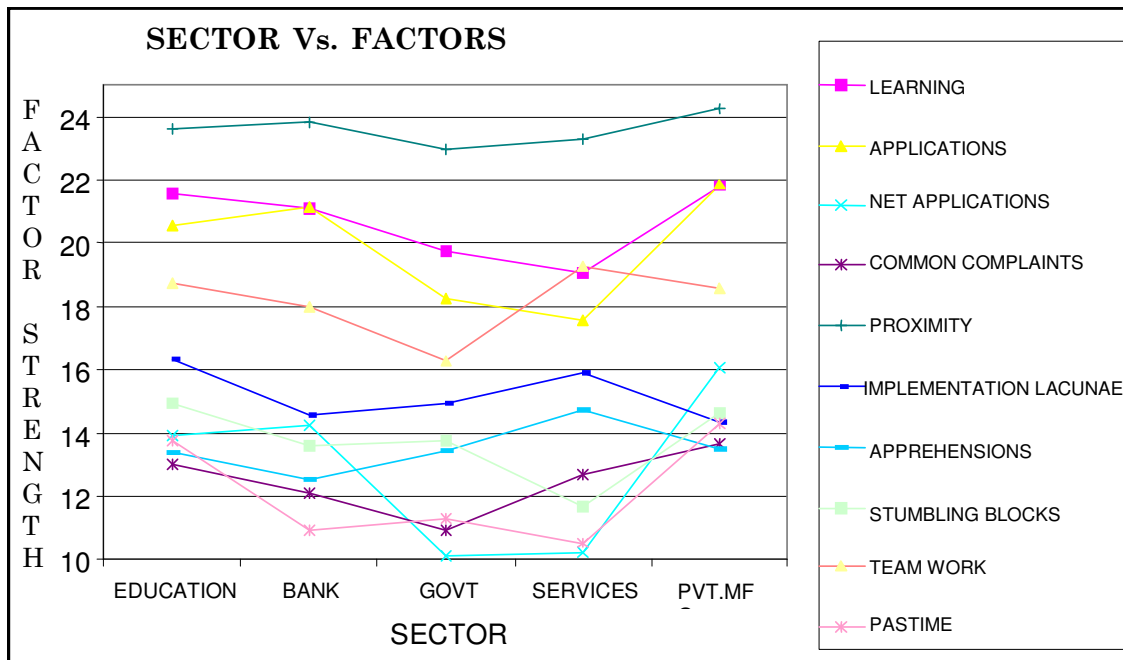
- **Radicals**- who were tops in adaptation and extent of use but who were most vociferous in their objections regarding the problems,
- **Believers**- who also had adjusted admirably to computers but unlike the radicals who take the hurdles in their stride and show faith in the existing system infrastructures, and
- **Laggards**- who are yet to catch up with the digital era and seem least involved in the changes going around them. The following chart will make it clear for an onlooker the uniqueness in their adjustment status.

The Radicals who are in the centre of the chart show the highest adaptation levels. But the case is that of a Pandora's box. They hit hard at the negative factors inherent in the system as well as make the most of the same. Incidentally, the groups show significant differences in all the 14 factors. The confidence level was an amazing 100% for all the 14 factors, making the boundary line very vivid and meaningful.



Believers are tolerant and optimistic regarding most of the problems in the change process involving computers. It is heartening to note that they are the nearest to computers and have the highest faith in its capabilities. Long time spans with computers have not resulted in much grudges on health or social issues. They cope best with the problems of virus and are careful not to lose any of their work on the computer. They are also the loneliest group. However, they seem to like their independence and privacy, as evinced by the factor of teamwork. They give the maximum approval or rather minimum disapproval to the way in which the change is being implemented. With their positive attitudes, the believers can reasonably adapt to the change without much problems. Radicals are team workers who expect perfection in their work environment. Their critical scepticism about the structural problems can be the reason why they don't have the highest faith in the system. They are too realistic to view computers as a magical panacea (driving forces and economies). Their proximity to the system is also in the second slot. This may explain their vulnerability to the stumbling blocks. Nevertheless, if given the opportunity, these radicals may become effective leaders who can bridge the lacuna in the BPRE. With their strong inclination to learn and apply, they may work wonders if they are properly mentored.

The laggards, as the name implies, finish last in the race to computerise. They exhibit the least faith in the system among the three groups. They rank last in all the positive factors and hence may be the most difficult group to convert. Their lackadaisical attitude could be stemming from the poor incentives they receive from their management for adapting. In case of downsizing, these may be the first to go.

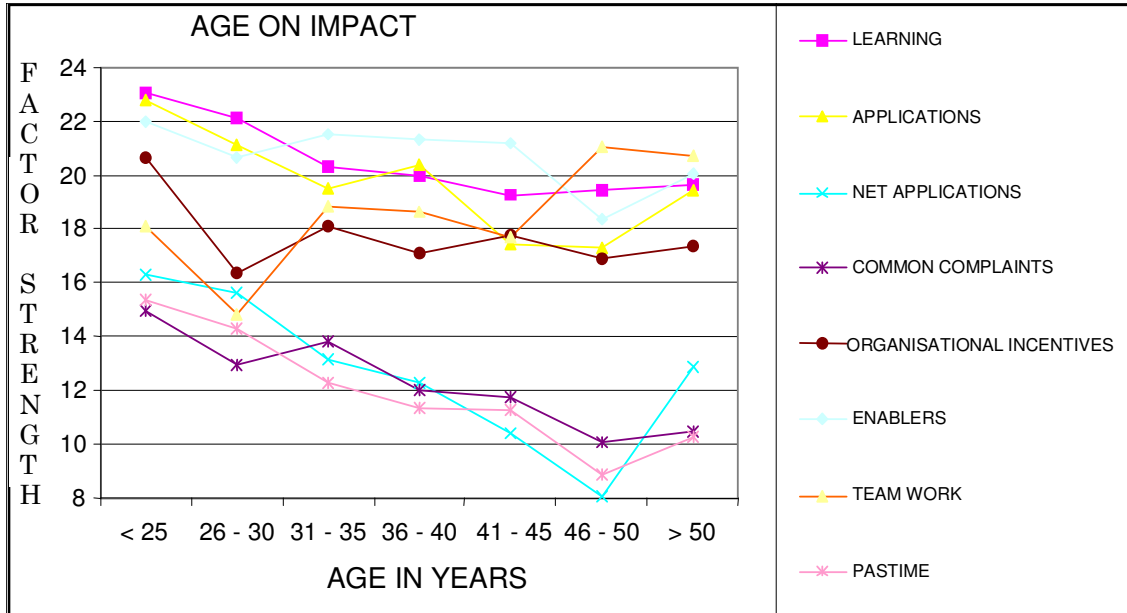


Looking at the differences in adaptation between the **five sectors** used as segments for information gathering, 10 out of 14 factors showed significance. Driving forces are equally strong among the five. There is also no difference in **organizational incentives**, or **enablers**. Belief in the generation of economies is also universal.

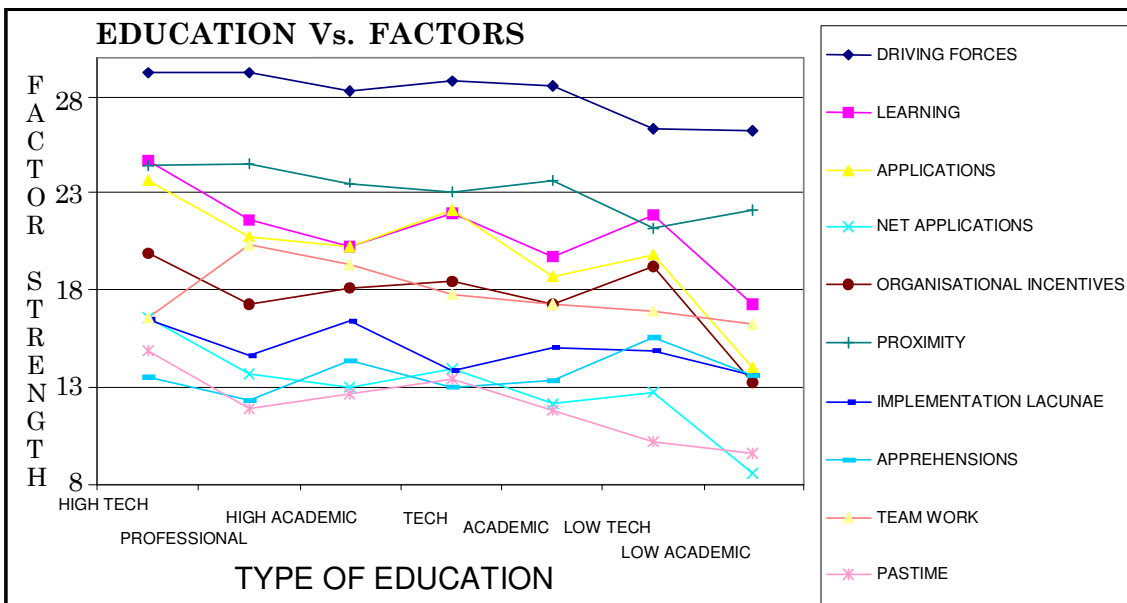
The business sector comes up as the strongest in the process of adaptation and leveraging. They top in **learning**, **applications** (net and stand-alone), and proximity. As the most intensive users of computers, they seem to have maximum **complaints** and **stumbling blocks**. Not only do they use computers for work, they also seem to depend on it heavily for personal benefits. **Passing time** with computers is the highest with the private business sector closely followed by the education segment. The education sector experiences maximum **implementation lacunae** and suffers most **obstacles**. However, it is strong in **learning** and **teamwork**. Banking and insurance sector apply computers strongly for both **stand-alone** purposes and with **net work** capabilities, and are second only to the business sector. The government sector along with the service sectors, come last with the lowest scores shared between them. Apprehensions are the highest among the service sector regarding the consequences of computerization.

There seems no significant difference in the dimensions of driving forces, proximity, implementation lacunae. Apprehensions, stumbling blocks or economies, which can be attributed to variations in age. The lower age groups have stronger inclinations to learn with the youngest leaning most towards learning. Using computers also differs with age be it lone applications, net applications or pastimes.

Standing first in the extent of utilization has resulted in this youngest age group having the most complaints regarding boredom, health, isolation etc. The organizations are favoring this group when it comes to offering incentives to adapt. This could be the reason for this group being strong on applications. Strangely enough, the immediate seniors rank last, in receiving incentives to change. The youngest could be at their entry level and so get these encouragements as part of their induction and lure to attract the best to the company. The ardor to pamper the slightly senior workers seems to be rather cold. This group of people between 26-30 years of age seems to be on the wrong end when it comes to teamwork too. Another remarkable phenomenon in this analysis



was the fact that the senior most in the group overshadowed their juniors on applications, learning and teamwork. In teamwork, though the seniors seem to have an edge over the youngsters this could be due to the fact that by virtue of their seniority they are able to command support from others in the organization.



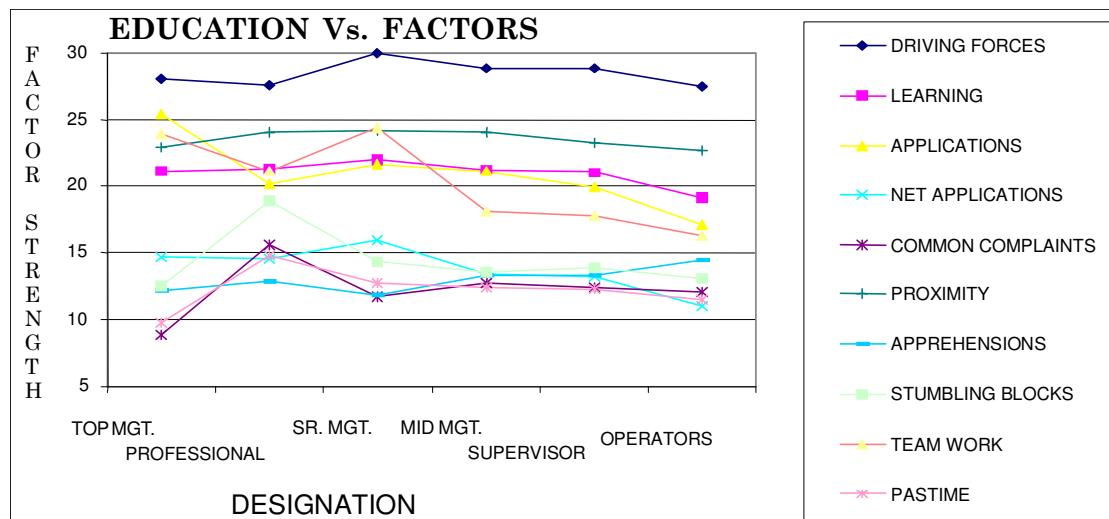
Clustering was tried on basis of the different educational qualification of the samples. For simplification, educational levels were brought down to seven. Namely, Low Technical (e.g. Diploma, Certificate courses) Technical (B.E., B.Sc Computer, BCT, BCA etc.) High technical (M.Sc Computer, MCT, ME, MS etc.) High academic (MA, M.Sc., M.Phil, Ph.D. etc without BE or computers), Academic (graduates) low academics (with just schooling) and professional (MBA, CA, MBBS, IAS, IPS, IFS etc.).

Eight out of the 12 factors brought significant differences between the categories. Professional and technically well-qualified people had higher driving forces. People with low educational qualifications had rather weak faith in the possibilities/advantages of computerization.

The eagerness and attitude to learn more about computers were very high among those with high technical qualification. Low academics showed the least tendencies to learn. Subsequently their computer applications use were the least. Applications were widely used among the high technical group with a very good margin. The management, for offering computer related incentives and training prefer the technically qualified people. This shows the mental of the managements that associate the technical qualifications with computers rather than academic ones. The low academics are highly ignored in this aspect. Either this may be due to their low interest shown or poor interest in the change. They may feel insecure about coping with thenw advances.

When it comes to the association with computers too, there is a market increase among the high techs. The high academics are the farthest from computers in their work environment. Surprisingly the professionals and the technically qualified have greater apprehensions about computerization than the rest of the groups. They seem strong in their belief that the manual system is reliable and time tested and was simple to work with. They also fear that there is lack of proper training to adopt computerization. They are more anxious that computers might cause retrenchments and unemployment. These issues make them feel even threatened by the invasion of computers at work. In this aspect the ones with low technical qualifications seem the least disturbed. The advanced us age of computers in a net worked environment is steeply high among the professionals. Understandably, low educational qualifications are a deterrent to such sophisticated applications of this modern device.

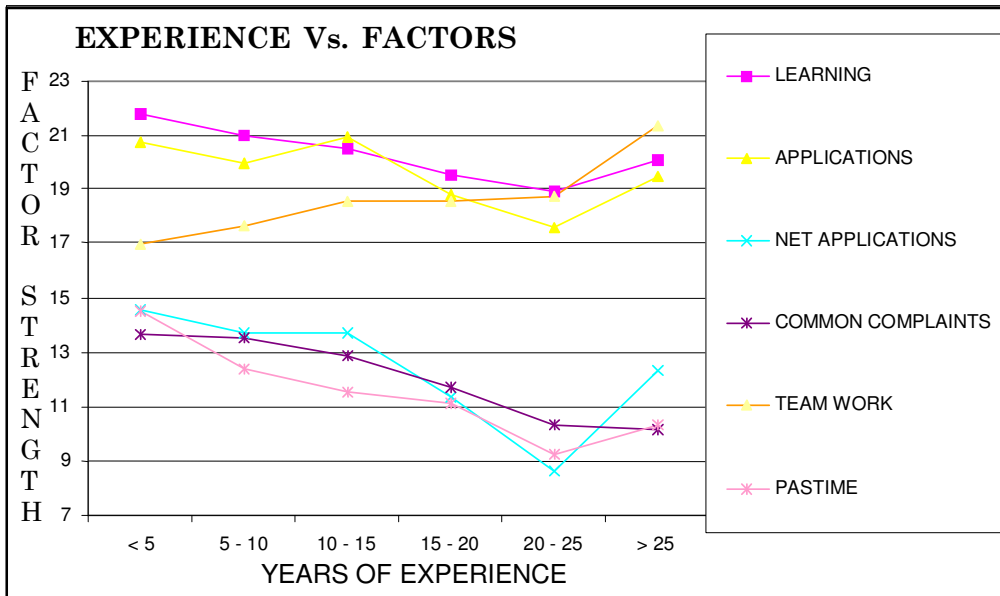
It is evident that there is a significant association between the educational qualifications and the impact of computers on work atmosphere of people. If ever there is marginalization of people, those with low educational qualifications will be the first to go. There is no evidence of differences in opinion regarding the economies that may arise out of computers and the negative impact of isolation viz. health problems, delays, boredom and helplessness. Implementation lacunae is also felt uniformly by all the groups. Problems of virus attacks, power failures and deadlocks affect people irrespective of their qualifications. All were equally seeking to use the computers for personal benefits like web surfing and gaming.



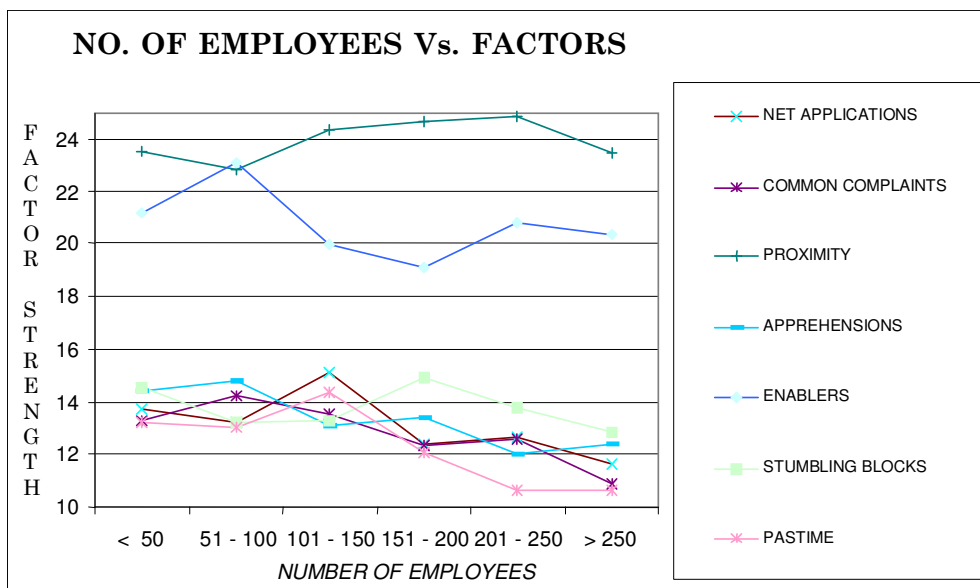
The fourteen factors were compared between six levels of **hierarchy**. Professionals like Chartered Accountants, Doctors, Lawyers and Engineers who were on their own were squeezed between top management and senior management. **Driving force** was the highest among senior managers. The lowest level in the hierarchy had the weakest driving force. It was a significant revelation to note the professionals too having almost the same lack of driving forces. The operatives were sceptic about computers mostly for fear of losing their jobs and being the least equipped to understand (**learning and organizational incentives**) or use the systems. The professionals were shrewd in the sense that since their jobs inherently required their expert human skills – it was difficult for the computers to be of much help. They also find the problems of virus and other technical hassles too hard to withstand. They seem to be the most affected by the **stumbling blocks**. Nevertheless, they use the system maximum for personal gratification. Since they are their own masters, their score is the highest when it comes to the factor of **pastime**. Their lukewarm response to IT also seems to stem from their high score in common

complaints. They seem to have the maximum drag factors like delays, helplessness, isolation boredom and health problems arising from computer use. Even in **organizational incentives** like training and consultations, they fail to make the mark. They have not taken pains either to train for IT or make proper plans to convert.

Senior management seems to be doing extraordinarily well when it comes to computers. They top in **driving forces**, all **applications**, inclination to **learn**, **nearness** to computers, as well as **teamwork** and **roping in help**. They seem to be well geared and optimistic about computerization. There was no significant difference regarding **implementation lacunae** and **enablers**, though the trend was that of more satisfaction with the higher echelons, which waned as the hierarchy came down. Though there was only significance at 93% confidence level regarding **organizational incentive**, the same trend prevailed where the top managements merited themselves as on better tidings. There was also unanimous agreement regarding the **economies** of computerization. All seven hierarchies agree in unison that cost reduction and time savings are possible.

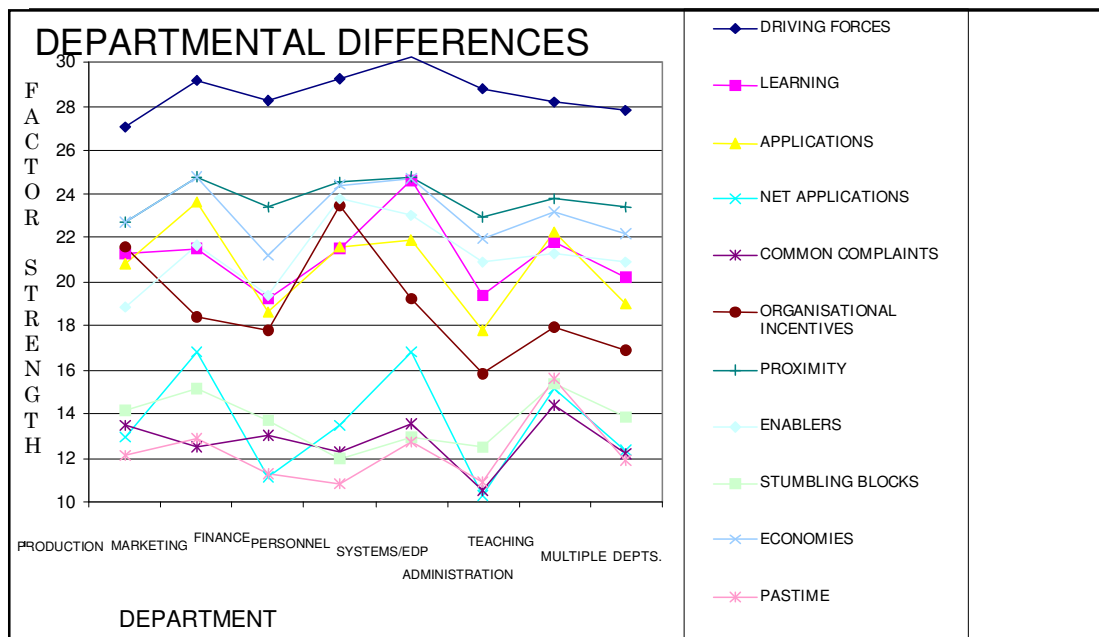


Another dimension in demography used to study adaptation was **work experience**. This is different from years of usage. Here, the absolute work experience was considered and not the period of computer use. Six



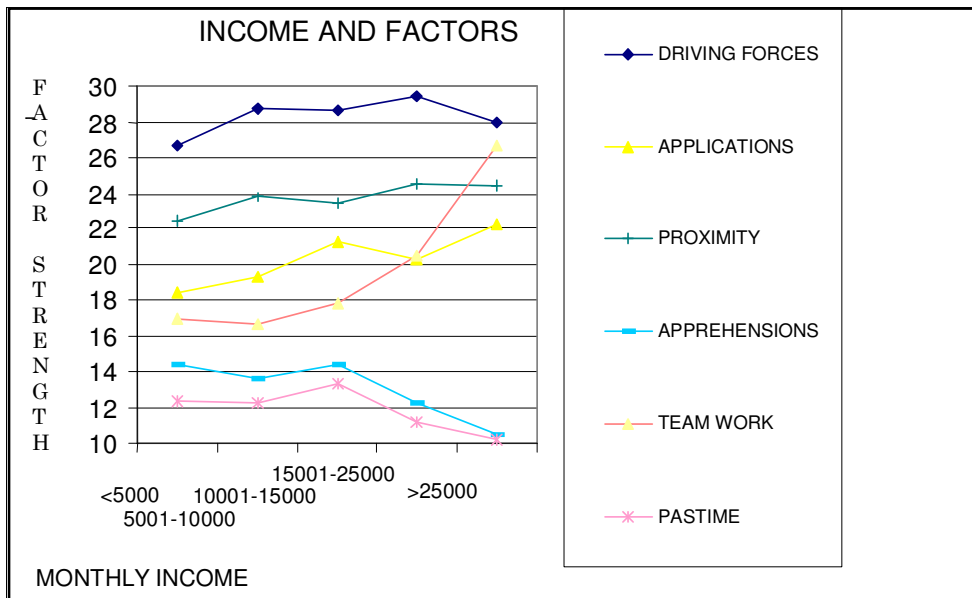
among the fourteen factors exhibited significant differences. **Driving forces** are equally strong in all groups. **Learning** attitudes vary with the freshers having the most inclination and those with 20-25 years' experience being least inclined to do so. **Applications** are also more in the junior group when compared to the more senior. What is interesting here is the consistent dip in the line at 20-25 year experience group and picking up of adaptation in the next bracket. It will be worth while to see if this trend coincides with the fatigue trench in the 8-10 years' use, which is overcome after the next 2 years.

When it comes to the impact differences based on number of employees, seven of the fourteen factors seem to have variations. **Driving forces, learning, lone applications, organizational incentives, proximity, implementation lacunae, teamwork** and **economies**, score more or less equally. **Common complaints, apprehensions, and pastime** show strong differences. **Net application, proximity, enablers** and **stumbling blocks** show significant differences though at only 5% significance levels. There is better usage (**applications**) among the smaller organizations, though the 101-150 category tops this list. **Proximity** shows a trend incongruent to the two **application** factors. People in the large organizations have better closeness with computers – organizations with 150-200 employees top in **proximity** as well as **obstacles**. The longest time spenders may incidentally experiment the most impact of virus, shutdowns and loss of data. Those working for organizations with employee-strength of less than 100 seem to be more **apprehensive**, where as people working at large organizations are less so. The employees of smaller organizations use the computers more for **pastime** than the others. This could be explained by the fact that most professional and small entrepreneurs spend most of their time at work but since they do not have much accountability so can afford to use computers for personal benefits.

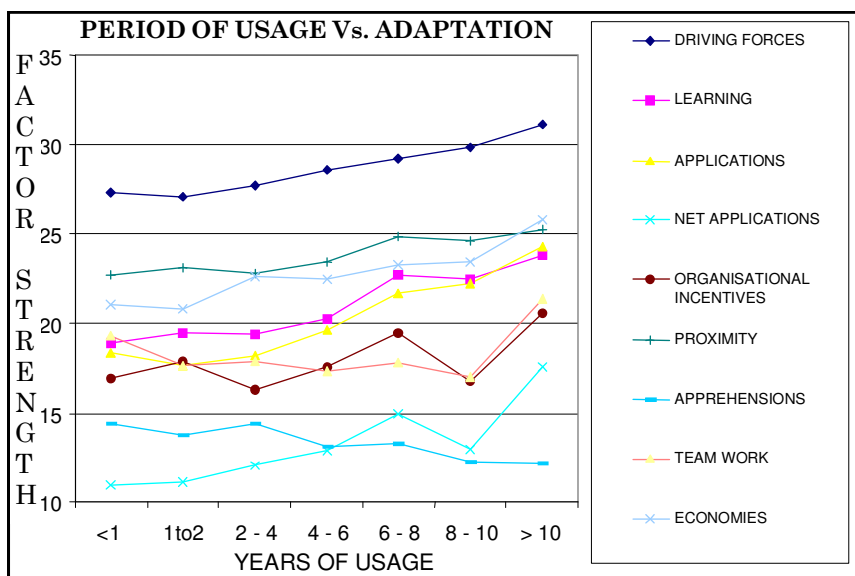


Comparing the departments for IT attitudes- except in **apprehensions** and **teamwork**, all the twelve factors show significant differences. Naturally, the systems department has the highest faith in the machine's abilities showing the strongest **driving forces**. Production department and those catering to multiple functions were doubtful regarding the same. Likewise in **learning** too system is at the top. Surprisingly finance department has the least inclination to learn about computers or its applications. Though we say that finance can make the most of these modern apparatus it looks like marketing is doing much better in taking advantage of computers. However, in **networking**, system has an edge of over marketing. **Organizational incentives** and **enablers** are heavily lavished on the HR people and administration seems to have the raw end of the deal when it comes to this factor. When it comes to the factor of **implementation lacunae**, the differences are less significant, just missing the 95% confidence level requirement. The teaching communities have the most grievances with marketing least agreeing with them. Systems, HR, Finance and Administration more or less are equal in their impressions regarding this factor. Looking at **proximities** to the systems, marketing and EDP are the closest

to computers, which explains their best use (**applications**) of the system. The teaching community seems to be experiencing the maximum **stumbling blocks** closely followed by the personnel department. Considering the **economies** accruing due to computers, the finance department is highly sceptical. However, people in marketing, systems and HR are confident that these economies can be achieved by changing over to digital management. The teaching sector is very significantly using the system for **surfing and entertainment**. Surfing could be for the sake of academic research, whereas entertainment may be possible due to less demanding work schedules.



Lesser factors exhibit variations when anchored to **income** levels. **Driving forces** are least among the economically poorest section (Rs. <5 K per Month.). **Applications** take an almost upward trend with its zenith at the highest income bracket. **Common complaints** though at 6% (significant level) show the opposite trend with the highest income group having the least problems. **Apprehensions** lead an almost parallel pattern. The least paid seem the most scared of the change (may be due to fear of unemployment). The highest income bracket exhibit best **teamwork**. Probably being seniors, they rein in help easier than the others. The middle-income group (between Rs.10 K – 15 K per month) have adapted to vibe with computers for **passing time** and personal gain.



Irrespective of **length of use**, *common complaints*, *implementation lacunae*, *stumbling blocks* and *pastime* are equally prevalent among the samples. Definitely, there is a break point at 4-6 years before which the pick up seems sluggish. By 8-10 years' of usage there happens to be a trough / trench / dip where some fatigue may have set in. However, things look better once they get over this period. After 10 years, the users adapt best to computers. Even their **apprehensions** seem to ease.

Conclusion

One has to wait and see if this research can make any impact on the IT strategies of the brick and mortar companies, which are the foci of the study. This dipstick survey has established a few useful facts. The association between organisation incentives and usage levels, attitudes, and willingness to amicably change, is strong and positive. Implementation lacunae is the most commonly felt phenomenon and people adjust differently to the same change in environment and we need a cafeteria approach to manage them effectively.

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Annexures

Annexure - 1

Factors Emerging Clusters	Laggard	Radical	Believer	Sig.
Driving Forces	26.25	29.94	30.67	0.00
Learning	17.70	23.91	22.88	0.00
Applications	14.51	24.69	24.59	0.00
Net Applications	8.05	18.57	16.51	0.00
Common Complaints	11.52	18.77	10.25	0.00
Organisational Incentives	14.17	26.18	17.62	0.00
Proximity	22.27	24.20	25.10	0.00
Implementation Lacunae	15.10	17.95	13.82	0.00
Apprehensions	13.37	16.90	11.80	0.00
Enablers	18.65	23.28	22.72	0.00
Stumbling Blocks	12.91	17.69	12.64	0.00
Team Work	17.21	22.84	16.79	0.00
Economies	19.27	24.83	25.97	0.00
Pastime	10.12	18.17	11.65	0.00

Annexure - 2

Factors Type of Organisation	Education	Bank	Govt.	Services	Pvt. Mfg.	Sig.
Driving Forces	28.46	28.09	28.39	28.81	28.54	0.85
Learning	21.53	21.08	19.76	19.03	21.80	0.00
Applications	20.53	21.13	18.23	17.58	21.84	0.00
Net Applications	13.95	14.23	10.09	10.21	16.07	0.00
Common Complaints	13.03	12.13	10.97	12.70	13.69	0.01
Organisational Incentives	17.08	17.61	16.20	18.84	18.65	0.09
Proximity	23.60	23.85	22.98	23.30	24.25	0.05
Implementation Lacunae	16.34	14.59	14.97	15.88	14.37	0.01
Apprehensions	13.42	12.58	13.47	14.72	13.51	0.02
Enablers	21.24	20.66	20.24	20.36	22.08	0.16
Stumbling Blocks	14.96	13.63	13.76	11.70	14.65	0.00
Team Work	18.72	18.00	16.30	19.24	18.59	0.05
Economies	22.91	23.51	22.09	21.23	23.22	0.09
Pastime	13.79	10.97	11.33	10.54	14.33	0.00

Annexure - 3

Factors	Age										Sig.
	< 25	26 - 30	31 - 35	36 - 40	41 - 45	46 - 50	> 50				
Driving Forces	28.82	28.16	27.94	28.71	28.44	28.31	29.19	0.72			
Learning	23.09	22.11	20.35	20.02	19.26	19.46	19.64	0.00			
Applications	22.80	21.11	19.53	20.42	17.42	17.26	19.48	0.00			
Net Applications	16.26	15.60	13.16	12.26	10.42	8.05	12.85	0.00			
Common Complaints	14.95	12.93	13.78	12.00	11.75	10.06	10.49	0.00			
Organisational Incentives	20.65	16.30	18.07	17.09	17.75	16.88	17.31	0.03			
Proximity	23.92	23.87	23.04	23.82	23.68	23.29	23.42	0.53			
Implementation Lacunae	15.41	14.83	15.43	15.53	14.77	15.60	15.08	0.89			
Apprehensions	14.67	13.20	14.41	12.96	13.24	13.16	12.90	0.09			
Enablers	21.99	20.68	21.53	21.30	21.22	18.35	20.06	0.04			
Stumbling Blocks	14.90	14.29	13.75	14.29	12.52	12.74	12.94	0.07			
Team Work	18.08	14.81	18.83	18.57	17.68	21.05	20.75	0.00			
Economics	24.26	22.81	22.67	22.11	22.69	20.74	22.47	0.20			
Pastime	15.35	14.25	12.27	11.31	11.28	8.89	10.25	0.00			

Annexure - 4

Factors	High Tech.	Professional	High Academic	Tech.	Academic	Low Tech	Low Academic	Sig.
Driving Forces	29.27	29.25	28.30	28.82	28.54	26.39	26.27	0.02
Learning	24.70	21.55	20.19	21.89	19.71	21.87	17.22	0.00
Applications	23.74	20.73	20.20	22.13	18.69	19.80	13.99	0.00
Net Applications	16.59	13.70	13.05	13.96	12.14	12.72	8.56	0.00
Common Complaints	14.40	12.77	12.53	12.79	12.14	13.48	9.70	0.08
Organisational Incentives	19.88	17.23	18.12	18.44	17.27	19.22	13.30	0.05
Proximity	24.49	24.59	23.51	23.04	23.73	21.16	22.07	0.00
Implementation Lacunae	16.51	14.63	16.39	13.87	15.02	14.91	13.63	0.01
Apprehensions	13.49	12.29	14.34	13.01	13.35	15.52	13.64	0.01
Enablers	22.83	20.84	21.34	21.59	20.47	19.22	20.17	0.23
Stumbling Blocks	13.26	15.12	13.34	14.30	13.60	13.02	12.73	0.21
Team Work	16.59	20.28	19.27	17.76	17.22	16.89	16.23	0.01
Economies	23.91	22.36	23.13	23.24	22.27	20.59	22.31	0.47
Pastime	14.87	11.90	12.70	13.47	11.80	10.21	9.60	0.00

Annexure - 5

Factors	Designation	Top. Mgt.	Professional	Sr. Mgt.	Mid Mgt.	Supervisor	Operators	Sig.
Driving Forces		28.03	27.56	29.98	28.90	28.83	27.55	0.02
Learning		21.14	21.42	22.01	21.24	21.05	19.14	0.00
Applications		25.42	20.13	21.71	21.16	19.94	17.02	0.00
Net Applications		14.70	14.54	15.96	13.45	13.15	11.04	0.00
Common Complaints		8.81	15.51	11.72	12.75	12.41	12.02	0.01
Organisational Incentives		23.46	16.64	18.40	18.11	17.01	16.81	0.07
Proximity		22.99	24.13	24.26	24.11	23.29	22.71	0.00
Implementation Lacunae		14.87	14.52	14.11	15.36	16.07	15.12	0.53
Apprehensions		12.19	12.87	11.80	13.35	13.26	14.48	0.02
Enablers		22.91	20.42	22.09	21.02	21.79	20.20	0.32
Stumbling Blocks		12.46	18.83	14.33	13.50	13.86	13.10	0.00
Team Work		23.99	21.08	24.46	18.02	17.68	16.31	0.00
Economics		21.64	20.88	23.52	23.35	22.78	21.60	0.09
Pastime		9.81	14.80	12.73	12.39	12.27	11.47	0.05

Annexure - 6

Factors	Years of Experience						Sig.
	< 5	5 - 10	10 - 15	15 - 20	20 - 25	> 25	
Driving Forces	28.19	28.34	28.89	28.14	28.05	29.80	0.22
Learning	21.77	20.98	20.54	19.55	18.88	20.13	0.00
Applications	20.79	19.99	20.95	18.79	17.55	19.51	0.05
Net Applications	14.52	13.68	13.71	11.34	8.64	12.32	0.00
Common Complaints	13.63	13.49	12.85	11.73	10.34	10.15	0.00
Organisational Incentives	18.14	17.18	18.13	17.35	18.06	16.76	0.82
Proximity	23.53	23.67	23.77	23.44	23.37	23.93	0.93
Implementation Lacunae	14.84	15.85	15.71	15.03	14.81	15.36	0.56
Apprehensions	13.86	13.85	13.50	13.32	13.07	12.76	0.62
Enablers	21.47	20.62	21.53	20.74	19.77	20.41	0.47
Stumbling Blocks	14.39	13.90	14.10	13.25	12.77	12.82	0.24
Team Work	16.95	17.63	18.52	18.52	18.72	21.34	0.01
Economies	23.07	22.92	22.84	21.06	21.75	23.49	0.18
Pastime	14.48	12.38	11.50	11.09	9.23	10.33	0.00

Annexure - 7

Factors	No. of Employees							Sig.
	< 50	51 - 100	101 - 150	151 - 200	201 - 250	> 250		
Driving Forces	28.35	27.60	28.64	28.21	28.72	28.79	0.68	
Learning	20.81	20.84	22.86	21.93	19.42	20.18	0.09	
Applications	19.58	20.85	23.48	22.11	20.18	19.19	0.06	
Net Applications	13.73	13.18	15.11	12.39	12.62	11.67	0.04	
Common Complaints	13.28	14.21	13.50	12.35	12.57	10.88	0.00	
Organisational Incentives	18.33	19.03	17.29	19.60	16.38	16.54	0.13	
Proximity	23.53	22.85	24.38	24.69	24.86	23.46	0.05	
Implementation Lacunae	15.17	15.34	15.11	17.16	17.06	14.76	0.11	
Apprehensions	14.39	14.80	13.07	13.41	12.04	12.40	0.00	
Enablers	21.17	23.10	19.94	19.08	20.80	20.31	0.05	
Stumbling Blocks	14.56	13.24	13.28	14.93	13.79	12.82	0.04	
Team Work	18.68	17.21	15.26	17.92	19.60	17.99	0.24	
Economies	22.59	22.52	24.32	20.66	23.64	22.41	0.54	
Pastime	13.22	13.01	14.37	12.10	10.63	10.66	0.00	

Annexure - 8

Factors	Department	Production	Marketing	Finance	Personnel	Systems	Admini.	Teaching	Multiple	Sig.
Driving Forces		27.03	29.17	28.23	29.24	30.26	28.79	28.21	27.77	0.03
Learning		21.22	21.45	19.20	21.45	24.62	19.36	21.76	20.17	0.00
Applications		20.79	23.60	18.61	21.53	21.82	17.75	22.22	18.99	0.00
Net Applications		12.93	16.76	11.13	13.47	16.78	10.27	15.15	12.35	0.00
Common Complaints		13.48	12.49	12.98	12.29	13.57	10.51	14.40	12.16	0.00
Organisational Incentives		21.54	18.36	17.75	23.44	19.23	15.84	17.90	16.87	0.00
Proximity		22.71	24.76	23.33	24.57	24.79	22.92	23.76	23.38	0.01
Implementation Lacunae		14.84	13.83	15.71	15.58	15.03	15.51	16.65	14.56	0.06
Apprehensions		12.69	12.46	13.92	11.93	14.01	13.38	13.60	13.76	0.49
Enablers		18.83	21.64	19.33	23.75	23.00	20.88	21.28	20.83	0.01
Stumbling Blocks		14.13	15.11	13.72	11.99	12.97	12.51	15.35	13.85	0.02
Team Work		22.07	17.91	17.67	18.99	16.96	18.80	19.02	17.65	0.28
Economies		22.64	24.81	21.18	24.44	24.75	21.89	23.12	22.17	0.01
Pastime		12.10	12.88	11.29	10.84	12.71	10.87	15.56	11.92	0.00

Annexure - 9

Factors Monthly Income	<5000	5001-10000	10001-15000	15001-25000	>25000	Sig.
Driving Forces	26.70	28.73	28.67	29.41	27.99	0.00
Learning	19.96	20.60	20.81	20.99	21.58	0.54
Applications	18.36	19.27	21.22	20.23	22.19	0.02
Net Applications	12.86	11.96	13.83	13.08	15.49	0.08
Common Complaints	13.20	12.25	13.23	12.02	9.89	0.06
Organisational Incentives	16.34	17.75	18.76	17.63	17.00	0.26
Proximity	22.40	23.74	23.33	24.57	24.47	0.00
Implementation Lacunae	14.99	15.11	15.68	15.28	14.30	0.69
Apprehensions	14.35	13.65	14.41	12.22	10.49	0.00
Enablers	20.58	21.29	20.48	21.10	21.08	0.79
Stumbling Blocks	14.53	13.17	13.90	13.78	13.93	0.39
Team Work	16.88	16.67	17.76	20.47	26.73	0.00
Economies	21.38	23.27	22.88	22.83	19.94	0.07
Pastime	12.38	12.23	13.33	11.13	10.21	0.03

Annexure - 10

Factors Period Using Computers (Years)	<1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10	> 10	Sig.
Driving Forces	27.26	27.01	27.69	28.51	29.21	29.87	31.12	0.00
Learning	18.88	19.49	19.38	20.23	22.73	22.48	23.84	0.00
Applications	18.37	17.69	18.24	19.59	21.65	22.24	24.27	0.00
Net Applications	10.96	11.09	12.04	12.95	14.95	13.02	17.58	0.00
Common Complaints	13.49	12.27	12.20	12.16	12.81	12.07	12.76	0.71
Organisational Incentives	16.96	17.90	16.31	17.56	19.45	16.77	20.54	0.03
Proximity	22.68	23.11	22.76	23.41	24.85	24.57	25.19	0.00
Implementation Lacunae	15.13	15.10	15.26	14.56	15.35	16.67	15.14	0.31
Apprehensions	14.45	13.81	14.44	13.17	13.31	12.27	12.15	0.01
Enablers	19.63	20.25	20.31	21.89	21.67	20.92	22.01	0.10
Stumbling Blocks	14.07	12.18	14.15	13.46	13.40	14.53	14.44	0.24
Team Work	19.29	17.68	17.92	17.30	17.78	17.06	21.36	0.04
Economies	21.03	20.82	22.62	22.46	23.27	23.42	25.77	0.00
Pastime	11.21	12.71	12.14	12.06	13.14	11.48	13.28	0.34