



A study of information technology in a fuzzy space using computer for their reliability attributes

R.N. Yadava*, G.P. Chhalatra**, S.P. Saxena*** and Rajesh Khattri****

*RRL, Advanced Matrics and Processes Research Institute, Bhopal, (M.P.)

**Electrical Engineering, Govt. Engineering College, Jabalpur (M.P.)

***Director T.I.T. MCA, Bhopal, (M.P.)

****R.G.P.V. Technical University, Bhopal, (M.P.)

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ABSTRACT : Information Systems and technology is catching great momentum and acceleration, now a days. It is essential to study them, using them as vague systems and highly uncertain plans. Reliability studies can bring out large number of events such as risk, hazard, danger, damage calamity and disaster in the complementary function of the reliability. Life of an IT system is an essential parameter. Every system has life cycle it can not grow infinitely, more over there are constraints that cut the objectives and make the system optimum. One can find new techniques and technology for information's consumes a large amount of money, time, motion, labour and skill. If it is system, it must be reliable, secure and adequate in the working. The failure rate may be calculated using well known techniques, and the reliability is found Maxwell distribution function and exponential distribution function.

I. INTRODUCTION

The information systems and technology grew in sequence since the primitive society needs. Without information there is no progress in the society. It is infinitely high and very large number of activities are involved.

One cannot define and explain the information technology so easily but what is 'going on using electronics and telecommunication system using computers is the IT systems. It is the information technology system. Technology means application of computers in easy manner and large input and output systems an there methods of control.

A number of books and papers are collected to study the various aspects of, IT and systems and developed. These systems are fuzzified and then defuzzified using new methods used here. Systems are made with elements and represented by their elementhood or fuzzy grade of truth of their reliabilities.

II. FUZZY GRADE OF TRUTH OF INFORMATION TECHNOLOGY

Computer is used in all systems of engineering, Medicines, science, entertainment and government systems. It is no worth to describe applications which are well known. One can form fuzzy set of all the applications to find their reliability, security, risk and MTBF given in Table-1 this tabular or set study is quite understandable and can be followed easily in a simple plane of skill and knowledge.

Table-1 has 18 Fuzzy elements forming a fuzzy cardinality 15.278 and reliability .8487 at the failure rate $A = .16395$ and MTBF 6.0992 years. Computers are used in entertainment, science, medicines and engineering, one can split this set of uses in a large number of elements but limited to 18

elements in this study. The critical uses of IT were made between 15 and 16 elements in this set CAE and POM, respectively computer aided engineering and Product data management. This is also realized in the IT system. The total space of IT may have a fuzzy grade of truth .8487 and it prolonged for a period of seven years and realized a fault or change to swing up or down. This is all made using self inferences, heuristic and dedision using a field study. The fuzzy cardinality of A, AR, Sec., MTSF and A, (availability), and maintainability may be found by center of area method and mean of mom out method. Fuzzy cardinality and relative fuzzy cardinality method may be simple. It is difficult to obtain the constraint of this set but a complementary function may work well as the constraint.

Many people say many things about the IT systems that can be also fuzzified and then defuzzified to obtain a fuzzy grade of truth of their statements.

III. COMPUTERS IN EDUCATION AND TRAINING

The information age is changing its way of working some jobs are disappearing, others are emerging and still many of them are radically transformed to IT. The IT has changed our education system drastically. One can form a fuzzy set of such events to find the optimization of the IT elements. Table-2 represent a fuzzy space or a fuzzy set of 26 elements. They have mutual coupling co-ordination, co-operation and synchronism to run in parallel.

Table-2 has 26 elements forming a fuzzy cardinality $IAI=21.983$ and fuzzy grade of truth .8455 at the failure rate 1678249 per year and MTBF 5.958 years. The elements 21 and 22 were at the optimum situation. The presentation aids and hypermedia were in the full swing of progress. It will take six years to the elements 21 and 22 to come up to the

Table-1

S. No.	Fuzzy Elements $\eta = 18$	$\mu A^{-}(\lambda)$	λ	λR	$S\epsilon$	T	A
1.	Computers in Entertainment	.776	.2536	.1968	.8032	3.943	.756
2.	Computers in Movies	.887	.1199	.1063	.8936	8.34	.866
3.	Computers in Music	.762	.2718	.2071	.7928	3.679	.712
4.	Computers in Advertisement	.896	.10981	.0984	0.901	9.106	.856
5.	Computer in Art	.662	.4124	.273	.727	2.424	.611
6.	Computers in Medicines	.796	.2284	.1816	.8184	4.384	.746
7.	Computers in Science	.811	.20948	.1698	.8301	4.773	.766
8.	Computers in Engineering	.912	0.9211	0.84	0.916	10.856	.887
9.	Electronic Data Interchange	.886	.121036	.1072	.8927	8.262	.836
10.	Computer Aided Design (CAD)	.838	.17673	.1481	.8518	5.658	.811
11.	Computer Aided Manufacturing	.792	.2332	.1846	.8153	4.288	.736
12.	Graphics Copabilities	.892	.11428	.1019	.898	8.75	.843
13.	Design Storage and Retrieval	.906	0.987	0.894	.9105	10.13	.889
14.	Automatic A Valuation of Specification	.912	0.921	.084	.916	10.857	.892
15.	Computer Aided Engineering (CAE)	.908	0.965	.08763	.9123	10.362	.887
16.	Product data Management (PDM)	.899	.1064	.0957	.9012	9.398	.862
17.	Future Prototyping	.877	.1312	.1151	.8848	7.62	.822
18.	Project Management	.866	.1438	.1246	.8754	6.95	.813

Table-2

S. No.	Fuzzy Elements $\eta = 26$	$\mu A^{-}(\lambda)$	λ	λR	$S\epsilon$	T	A
1.	Technological Familiarity	.877	0.1312	.1151	.8849	7.622	.826
2.	Techno Phobiat	0.896	0.1098	0.984	.9016	9.1074	.833
3.	Litracy: Reading and writing	0.776	0.2665	.2042	.7958	3.752	.723
4.	Mathematics: Thinking	.692	.3681	.2547	.7452	2.716	.622
5.	Mathematical Studies Must	.816	.2033	.1662	.834	4.918	.733
6.	Culture: Strong	.762	.2718	.20711	.7928	3.679	.702
7.	Study of Culture for IT	.886	.121036	.1072	.8927	8.262	.843
8.	Communication Skill	.769	.262	.20198	.798	3.816	.712
9.	Survival Skill	.892	.1142	.1019	.898	8.756	.866
10.	Learning how to learn easily	.912	.0921	.084	.916	10.857	.876
11.	Learning with changes	.936	.06613	.0619	.938	15.121	.892
12.	Computer in Schools	.912	.09211	.084	.916	10.856	.886
13.	Computer Aided Instructions	.911	.0932	.085	.915	10.736	.826
14.	Individualized Learning	.896	.1098	.0984	.9016	9.1075	.866
15.	Motivation	.886	.121036	.10773	.892	8.262	.832
16.	Confidence	.796	.2281	.1816	.8184	4.384	.736
17.	Programming Tools	.876	.1323	.1053	.8946	7.558	.826
18.	Simulation and Games	.836	.17912	.1497	.8502	5.582	.792
19.	Productivity Tools	.779	.2497	.1945	.8054	4.004	.711
20.	Computer Controlled Meida	.883	.12442	.1098	.8901	8.037	.826
21.	Presentation Aids	.892	.1142	.1019	.898	8.756	.823
22.	Hypermedia	.796	.2281	.1816	.8184	4.384	.733
23.	Interactive Multimedia	.812	.2082	.1691	.8308	4.803	.766
24.	Authoring Tools for Students	.822	.1960	.1611	.8388	4.1020	.768
25.	Dlstance Learning	.836	.1791	.1497	.8502	5.583	.788
26.	Virtual Schools, $\eta = 26$.846	.1672	.1414	.8585	5.980	.811

progress. The reliability of the fuzzy space of the IT would be .8455. This is some meaning full decision given by the fuzzification of IT elements.

IV. COMPUTERS IN HOME

Every one knows well the uses split it in 15 elements. There are a number of uses of the computers in the home. A few of them are represented by a fuzzy set forming a hamming distance

Table-3 represent home application of a computer in the 15 modes or elements. It is it system with 15 elements and reliability 88.2%. The optimization is obtained between 13 and 14 elements. Home entertainment and creativity program are most urgent uses.

The applications of computers in business and industries are growing day by day and replacing human workers. Business is increased due to CBIS and MIS. Information should be given quickly, timely and

Table-3

S. No.	Fuzzy Elements $\eta = 15$	$\mu_A(\lambda)$	λ	λR	$S\epsilon$	T	A
1.	House hold business	.668	.4034	.2695	.7304	2.478	.611
2.	Business application at home	.862	.1485	.1280	.8729	6.734	.833
3.	Word processor	.912	.0921	.084	.916	10.857	.886
4.	Spread sheet	.923	.0801	.0739	.926	12.48	.892
5.	Data base programs	.933	.0693	.0647	.9353	14.43	.899
6.	Personal information management	.836	.191	.1497	.8502	5.583	.811
7.	Accounting programs	.796	.2281	.1816	.1884	4.384	.733
8.	Income tax programs	.892	.1142	.10194	.898	8.756	.866
9.	Smart cards	.889	.1176	.1046	.8954	8.5034	.832
10.	Communication	.916	.0877	.08036	.9196	11.402	.889
11.	Education	.927	.0758	.07026	.9297	13.192	.876
12.	Information	.936	.0661	.062	.938	15.128	.912
13.	Home Ectertainment	.947	.0544	.0515	.9484	18.38	.922
14.	Creativity Programs	.956	.045	.043	.9569	22.22	.933
15.	Leisure Programs	.836	.17912	.1497	.8502	5.58	.811

V. COMPUTERS IN BUSINESS AND INDUSTRY

There are two elements of this system computer in: business and industry (i) Office automation (OA) and MIS management information system. One can develop 12 elemental applications computers in business and industry

as the IT system. This is a fuzzy set with 12 elements and represented by their element hood. They all form a cardinality 10.397 and relative cardinality 0.8664166 at the failure rate .1433875 optimization is made for communication management system and network management system. The reliability of IT system may be 863.64% and life 7 years of such a system.

Table-4

S. No.	Fuzzy Elements $\eta = 15$	$\mu_A(\lambda)$	λ	λR	$S\epsilon$	T	A
1.	Office automation	.899	.10647	.957	.90428	9.392	.826
2.	People office	.796	.2281	.1816	.8184	4.384	.733
3.	Ergonomics	.916	.0877	.08036	.9196	11.402	.896
4.	Office automation technologies	.866	.1438	.1246	.8754	6.954	.822
5.	Office automation system	.876	.1323	.11597	.884	7.558	.832
6.	Text management system	.792	.2332	.18468	.8153	4.288	.766
7.	Business analysis system	.811	.20948	.1698	.8301	4.773	.776
8.	Document management system	.836	.1791	.1497	.8502	5.583	.811
9.	Network system	.912	.09211	.084	.916	10.856	.886
10.	Communication management system	.908	.965	.0876	.9123	10.362	.876
11.	Netword management system	.906	.0987	.0894	.9105	10.1317	.892
12.	M.I.S.	.889	.1176	.1046	.8954	8.5034	.812

appropriately, that can increase the products of industries and business flow. Data base systems' keeps records of all kindly. Banks keep all types of records. One has to study a reliability of such systems for society profit and saving of time and motion of the people. Time and motion is a money.

VI. ELECTRONIC MAIL AND RELIABILITY ATTRIBUTES

We all know the electronic mail or e-mail. It is called snail-mail. The probability of working and life of such a system is difficult to calculate, but one can try to find life of such a system using fuzzy set theory. Reliability is a

good parameter of a system. First one has to make a random variables in to a system form with a large number of elements and their element hood. Each element has a failure rate according to the law of diminishing return.

How mailing lists work and the news group are the optimum problems where IT stays. This may be found from the field data how these two elements are the prompt, where the fuzzy element X can be optimized. If the sequence of the elements is recognized in increasing order the Table-5 represents these data and information.

Space-5 stands for electronic mail and its reliability attributes and life of successful working. One can assume

Table-5

S. No.	Fuzzy Elements	$\mu A(\lambda)$	λ	λR	$S\epsilon$	T	A
1.	Electronic-mail	.917	.0886	0.794	.2605	11.547	.887
2.	Why we use e-mail	.866	.1438	.1246	.8754	6.954	8.33
3.	e-mail is private	.936	.06613	.0619	.938	15.121	.892
4.	Working system of e-mail	.916	.08773	.08036	.9196	11.398	8.66
5.	e-mail name and address	.892	.1142	.10194	.898	8.756	8.32
6.	Mailing basics	.796	.2281	.1815	.8185	4.384	.723
7.	Address Book	.669	.3026	.2689	.7310	2.483	.592
8.	Signature and Address	.822	.19601	.1611	.8388	5.1017	.768
9.	File attachment	.833	.1827	.1522	.8478	5.473	.778
10.	Setting priority	.898	.10758	.0966	.9033	9.295	.736
11.	Replying and forwarding	.913	.09101	.08309	.9169	10.9878	.866
12.	e-mail messages	.922	.0812	.0748	.9251	12.315	.889
13.	Customizing your mail program	.892	.1142	.10194	.898	8.756	.837
14.	e-mail ethics	.962	.4387	.0372	.9627	25.84	.926
15.	Internet code of conduct	.836	.1792	.1497	.8502	5.583	.796
16.	Mailing lists	.788	.2382	.0372	.9627	25.84	.926
17.	News groups	.866	.1438	.1246	.8754	6.954	.822
18.	Bulletin Boards	.839	.1755	.1472	.8527	5.698	.768
19.	Advertising	.912	.09211	.084	.916	10.856	.869
20.	Privacy	.969	.3624	.2522	.747	2.76	.592
21.	Security	.908	.0965	.08763	.91236	10.36	.886
22.	Intellectual property	.906	.0987	.08943	.9105	10.131	.876
23.	Spamming	.896	.1098	.0984	.9016	9.1047	.832
24.	e-mail advantages	.938	.064	.061	.9399	15.625	.912
25.	e-mail disadvantages	.669	.4026	.2689	.713	2.483	.592
26.	Tips for effective e-mail use	.779	.2497	.1945	.8054	4.0048	.733
27.	Smiley's-Emotions	.886	.121036	.062	.938	15.128	.896
28.	On-line emotions	.936	.0661	.062	.938	15.128	.896
29.	Useful e-mail services	.911	.0932	.0849	.915	10.729	.887
30.	Finding as e-mail address	.923	.0801	.0739	.926	12.484	.899

Contd...

S. No.	Fuzzy Elements	$\mu A^-(\lambda)$	λ	λR	$S\epsilon$	T	A
31.	Free e-mail accounts	.922	.0812	.0748	.9251	12.315	.876
32.	Mail forwarding services	.896	.1098	.0984	.9061	9.1074	.811
33.	Reminder services	.886	.121036	.10723	.8927	8.262	.798
34.	Mailing lists	.856	.1554	.13309	.8669	6.435	.798
35.	How mailing lists work	.866	.1438	.1246	.8752	6.954	.819
36.	News groups	.892	.1142	.10194	.898	8.756	.836
37.	Mailing lists vs news group	.944	.0576	.0544	.9456	17.36	.912
38.	The Usenet Network	.913	.09101	.083	.917	10.987	.887
39.	Reading news group	.921	0.823	.0758	.9242	12.15	.866
40.	News group classification	.908	.0965	.08763	.9123	10.36	.887
41.	How to behave	.918	.0855	.0785	.9214	11.696	.877

35.843

the statements and operations as elements. The events are mutually coupled and sequential connected one after the another one can calculate the fuzzy accordingly. The COA and MOM methods also find such results and the value of X the elements between 35 and 36, how mailing lists work and news group. Table 5.

VII. INTERNETS AND THEIR RELIABILITY AND SECURITY

Internet is a communication network which bridges' all the small computer networks world wide as a whole. Internet is based upon internet technology in world wide web to build information systems within organization. It is a network computing environments which allows the user

share the information through the internet and web browsers. It works at low cost on top existing networks infrastructure closed organization network are interconnected with existing world wide internet which results in diverse information that can make strong the competitive advantages of the organization.

Intranets, extranets and e-commerce have in common to use the internet predominantly the web one protocols to connect business users. Intranets are more localized and can therefore move data faster than the more distributed extranets. The e-commerce is limited due to band width limitations. The amount of control that network managers can exert over users is different for the three technologies internet, extranet and ecommerce.

Table-6

S. No.	Fuzzy Elements	$\mu A^-(\lambda)$	λ	λR	$S\epsilon$	T	A	M
1.	Intranets	.916	.9\0877	.08036	.9196	11.402	.886	.867
2.	Extranets	.892	.1142	.10194	.898	8.756	.822	8.36
3.	Lan	.886	.121036	.1072	.8927	8.262	.832	.846
4.	Wan	.876	.1323	.1159	.884	7.558	.842	.853
5.	HTTP	.796	.2281	.1816	.8184	4.384	.766	.732
6.	TCP/IP	.906	.0987	.0894	.91056	10.131	.886	.872
7.	Intranet is sub network	.899	.10647	.0957	.9042	9.392	.836	.847
8.	Of Internet	.866	.121036	.10723	.89276	8.262	.839	.866
9.	It is a node of	.916	0877	.08036	.9196	11.402	.883	.834
10.	The internet	.922	.0812	.0748	.9251	12.315	.876	.886
11.	Character of internet	.936	0.662	.062	0.938	15.105	.892	.886
12.	Advantages of internet	.918	.0855	.0784	.9216	11.696	.866	.837
13.	Business Benefits of Internet	.962	.0387	.0372	.0927	25.839	.911	.926
14.	Braw backs of internet	.796	.2281	.1816	.8184	4.384	.755	.764

Contd...

S. No.	Fuzzy Elements	$\mu A^{-}(\lambda)$	λ	λR	$S\epsilon$	T	A	M
15.	Draw backs of internet	.812	.2082	.1691	.8308	4.803	.766	.742
16.	Performance limitation	.912	.09211	.084	.916	10.856	.837	.846
17.	Presentational issue	.798	.2256	.18006	.833	4.432	.711	.736
18.	The “me too” syndrome	.886	.121036	.10723	.8927	.262	.813	.876
19.	Need for organization	.918	.0856	.0785	.9214	11.682	.836	.848
20.	Benefits to employees	.899	.1064	.90957	.9042	9.398	.833	.845
21.	Benefits to organisation	.776	.2536	.1968	.8032	3.9432	.723	.742
22.	Internet and group ware	.876	.1223	.1159	.884	7.558	.833	.822
23.	Internet and e-mail	.932	.07012	.0656	.9343	14.2	.911	.896
24.	Internet and Client	.921	.0823	.0758	.9242	12.15	.889	.866
25.	Intranet and server system	.911	.0932	0.849	.915	10.73	.862	.878

The Table-6 may yield a fuzzy cardinality of 22.148 and fuzzy of truth .88592 at the failure rate $A=.121127$ and $MTBF = 8.255$ years. One can calculate the fuzzy cardinality of $A-(II.)$, A , $II.R$, Sc : $MTBF$, A and M assuming them fuzzy membership function of a fuzzy set $F(x)$ other complementary functions of reliability may be calculated. These are probability of failure (P), risk ($I.R$) or dP/dt , hazard, damage, danger, calamity and disaster using failure rate data.

Kinwal Rekhi School of Information Technology: In a country the industries that are focused on information technology on IT services have similar organizations and no one is different from the set pattern. Indian Institute of Technology, Bombay (IITB) has opened a school for IT, named Kanwal Rekhi School, is an excellent learning for connectivity of industrial organization. This school is a special one in the information technology learning and studies.

This may be the best in Indian IT Programmes to represent the reliability attributes of the system.

India trends business intelligence market poised for take of Indian companies switched to IT tools as they seek to use their data more intelligently. It can focus to building blocks for a resurgent Indian companies. There are seven IT product companies spawned by the Kanwal Rekhi School of IT. It is hoped that it may bring a tide in Indian society with a great reliability and stability. IT researchers and users create social responsibility of organizations. The IT people incorporating, corporate social responsibility in work culture. All the libraries of the world are merged to one unit of very large number of books and research journals. All computers are connected to each other for the e-mail and information's of all kinds.

Business incubator idea originally entailed the institute leveraging its academic strength and outstanding industry interface to review business plans submitted by students and pick out those, that were conceptually sound and financially viable. The students whose plans were selected were provided with financial and infrastructural support to set up a company, that could then work on its products

and services till it got sufficient funding to move out and make way for the next start up. The support to day includes office space in the business incubator, computers and connectivity, and most importantly access to the who's who of academia and industry to guide these fledglingly enterprises. The above narrative model is fuzzified and then

Phonologies is a name of company that has a mission to develop and market highly quality, low cost, reliable and scalable voice plate forms, which can make information and services from enterprises, telecommunication network and internet accessible over any telephone any time and from any where. The company has already developed a voice browser christened interpreter which enables surfing of websites based on voice activated commands. This would also mean that a user can just pickup a telephone and read content on a speech enabled website.

VIII. DISCUSSIONS

Information system and information technology are different. The technics used in information system is a technology. New technology and old technology. Modern IT is a computer technology and electrical or electronics technology. Micro processors and IC chips are used in these techniques. One can final their built-in reliability and dynamic reliability of materials used in all types of computers and their networks. Attempts are made to find a fuzzy grade of truth of Ia the IT systems. Computers used in education and training with a reliability and level of the confidence. Computers in business and industry occupy a good reliability. Electronic many ; may be reliable if some factors are watched carefully. Intranets are reliable due to their separate existence and locations.

A reliability and work of Kanwal Rekhi School of Information Technology is learned in a reliability plane. The school is 'promoting the IT systems. One can study the IT systems and IT technology separately. Here IT is a symbol to the IT Engineering. The word technology is merged in the system. Reliability of information technology and reliability of information system differ. Reliability of

information technology is static reliability while the reliability of information technology is a dynamic reliability.

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