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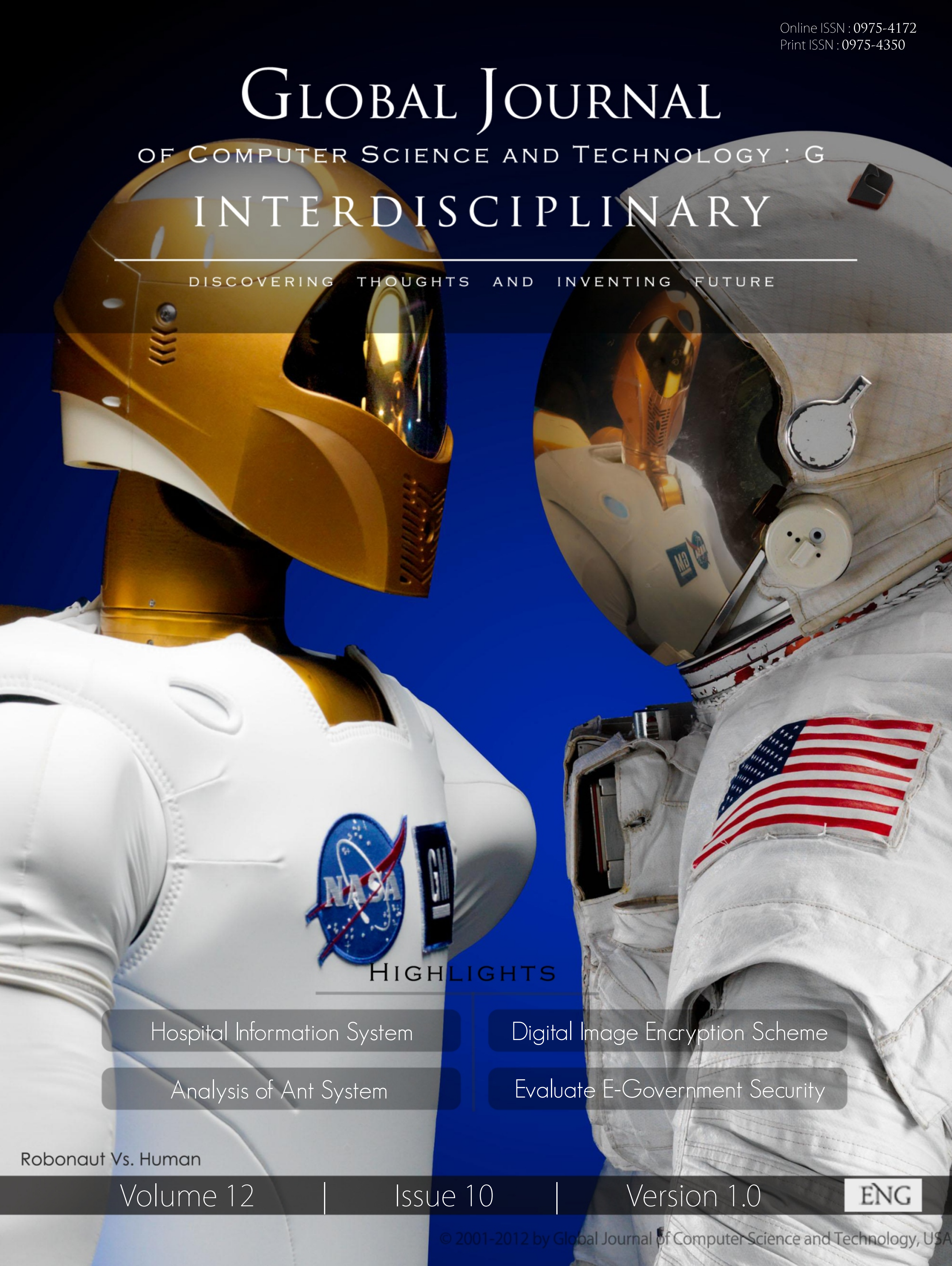
DISCOVERING THOUGHTS AND INVENTING FUTURE



Highlights

Hospital Information System

Digital Image Encryption Scheme

Analysis of Ant System

Evaluate E-Government Security

Robonaut Vs. Human

Volume 12 | Issue 10 | Version 1.0

ENG

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A Study on Hospital Information System at a Tertiary Teaching Hospital

By Syed Murtuza Hussain Bakshi & Shakeel.M
Owaisi Hospital and Research Center, Hyderabad

Abstract - The Global Hospital Information Systems market is forecast to grow at a Compound Annual Growth Rate of 10% from 2010-2017. Healthcare organizations globally recognize the importance of investing in information technologies. The HIS systems are large computerized data bases intended primarily for communication, store health and administrative information. It is evident that the use of HIS offers tremendous opportunities to reduce clinical errors, support health care professionals decision making, increases the efficiency & quality of patient care. The development, testing, and adoption of HIS remain limited and numerous barriers exist. There is an urgent need to take a fresh look at HIS. The advancement of information system & technologies made various new applications possible. The purpose of this study is to understand infrastructure, system practices, hindering and motivating forces behind HIS at a tertiary teaching hospital which is explorative in nature. The study also focuses on details about hardware, operational procedure and other important facts pertaining to forces resulting in acceptance of HIS.

Keywords : Healthcare, Hospital Information Systems, Computers, Information Technology.

GJCST-E Classification: J.3

A STUDY ON HOSPITAL INFORMATION SYSTEM AT A TERTIARY TEACHING HOSPITAL

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A Study on Hospital Information System at a Tertiary Teaching Hospital

Syed Murtuza Hussain Bakshi [α] & Shakeel.M [σ]

Abstract - The Global Hospital Information Systems market is forecast to grow at a Compound Annual Growth Rate of 10% from 2010-2017. Healthcare organizations globally recognize the importance of investing in information technologies. The HIS systems are large computerized data bases intended primarily for communication, store health and administrative information. It is evident that the use of HIS offers tremendous opportunities to reduce clinical errors, support health care professionals decision making, increases the efficiency & quality of patient care. The development, testing, and adoption of HIS remain limited and numerous barriers exist. There is an urgent need to take a fresh look at HIS. The advancement of information system & technologies made various new applications possible. The purpose of this study is to understand infrastructure, system practices, hindering and motivating forces behind HIS at a tertiary teaching hospital which is explorative in nature. The study also focuses on details about hardware, operational procedure and other important facts pertaining to forces resulting in acceptance of HIS.

Keywords : Healthcare, Hospital Information Systems, Computers, Information Technology.

I. Introduction

The report published by Fierce Healthcare 2011 highlights the Global Hospital Information Systems Market is forecast to grow at a Compound Annual Growth Rate of 10% from 2010-2017 i.e. It was valued at US$7.4 billion in 2010, and is forecast to grow at a Compound Annual Growth Rate of 10% to reach about US$14.7 billion by 2017. The high growth forecast for the period 2010-2017 is significantly influenced by accelerated efforts from the public and private sectors around the world to contain rising healthcare costs and enhance quality of care (Fierce healthcare, 2011). The global data 2010 research report talks about global Hospital Information Systems Company market Shares where GE Healthcare and Siemens Healthcare are the two leading companies in the HIS market and together account for 24% of the total market share. GE Healthcare is the market leader with 12.9% of the market share, followed by Siemens Healthcare and Cerner Corporation with 11.7% and 8.9% respectively (Global data, 2010).Healthcare organizations globally recognize the importance of investing in information technologies (Seyed et al, 2011).HIS is one of the most common computer systems designed to support health care services. These systems have large computerized data bases which are intended primarily for communication, store health and administrative information. HIS has a different components and includes broad scope and level of systems from departmental (a system limited a specific clinical or financial domain) to knowledge based systems that provide diagnostic support and intervention for patient care activities (Al-Nashmi and Maha Eissa, 2003).

It is evident that the use of HIS offers tremendous opportunities to reduce clinical errors (e.g. medication errors, diagnostic errors), to support health care professionals (e.g. availability of timely, up-to-date patient information), to increase the efficiency of care (e.g. less waiting times for patients), even to improve the quality of patient care (D.W. Bates et al, 2001). Despite the substantial opportunities for improvement in patient safety, the development, testing, and adoption of information technology remain limited and numerous barriers exist (David W. Bates et al, 2003).There is an urgent need to take a fresh look at HIS from the perspective of the organizational structure of hospitals, the funding of such systems, and the role that physicians should play in their operation. Failing this, it is believed that HIS and its medically related components will continue to suffer serious developmental lags (Bruce A .et al, 1987).

The latest information system technologies tools such as Clinical Data Warehouses (CDW), Clinical Decision-Support(CDS) systems, data-mining techniques, Online Analytical Processing (OLAP) and Online Transactional Processing (OLTP)), are used to maintain and utilize patient data intelligently, based on the users' requirements (Ashish Mangalampalli et al, 2007)

II. Methods

The study was conducted at a 1050 bedded tertiary care teaching hospital which is operational from 1996. Total of 8 departments of the hospital were studied for assessing the Hospital Information System. The present research is an Exploratory and qualitative in nature. The study is undertaken to know the current HIS

Author α : Vice Principal and Associate Professor Department of hospital management, Owaisi Hospital and Research Center, Hyderabad, 500058. E-mail : murtuza_in21@yahoo.com, murtuzain21@gmail.com
Author σ : Department of hospital management, Owaisi Hospital and Research Center, Hyderabad, 500058.
E-mail : in_searchofdestiny@hotmail.co.uk

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and to take an overview of enhancements done. Extensive interviews for the sample of 100 fulltime employees which included Clinical, Non-Clinical and Administrative Staff of the hospital have been taken followed by a questionnaire to get a handle on the situation and understand the phenomena. The sampling method followed is convenient sampling.

The data is collected through questionnaire, observation & interviews. The questionnaire was constructed with emphasis on the content, clarity and simple language. The scoring done for was on a five-point scale. The scoring has been given according to the nature of the questions. Forced field analysis technique is used for data analysis to show how to plan and implement a solution or make necessary changes in HIS.

III. Discussions

- The tertiary teaching hospital is using Aristotle Medics Software since 2008 before the implementation the entire hospital operations were paper based and manual.
- The HIS network architecture is centralized with a Mainframe server having a configuration of – HP ML350 XEON Server, 4GB RAM and 750 GB HDD and the workstations are installed in the respective department i.e. Patient Registration, Accounting and Finance, Billing, Laboratory, Radiology, Human Resource Pay Rolls, Stores and Pharmacy with a configuration of Core 2 Duo, 1 GB RAM and 320 GB HDD. (Refer Figure 1 And Figure 2)

Figure 1 : Skeleton Layout

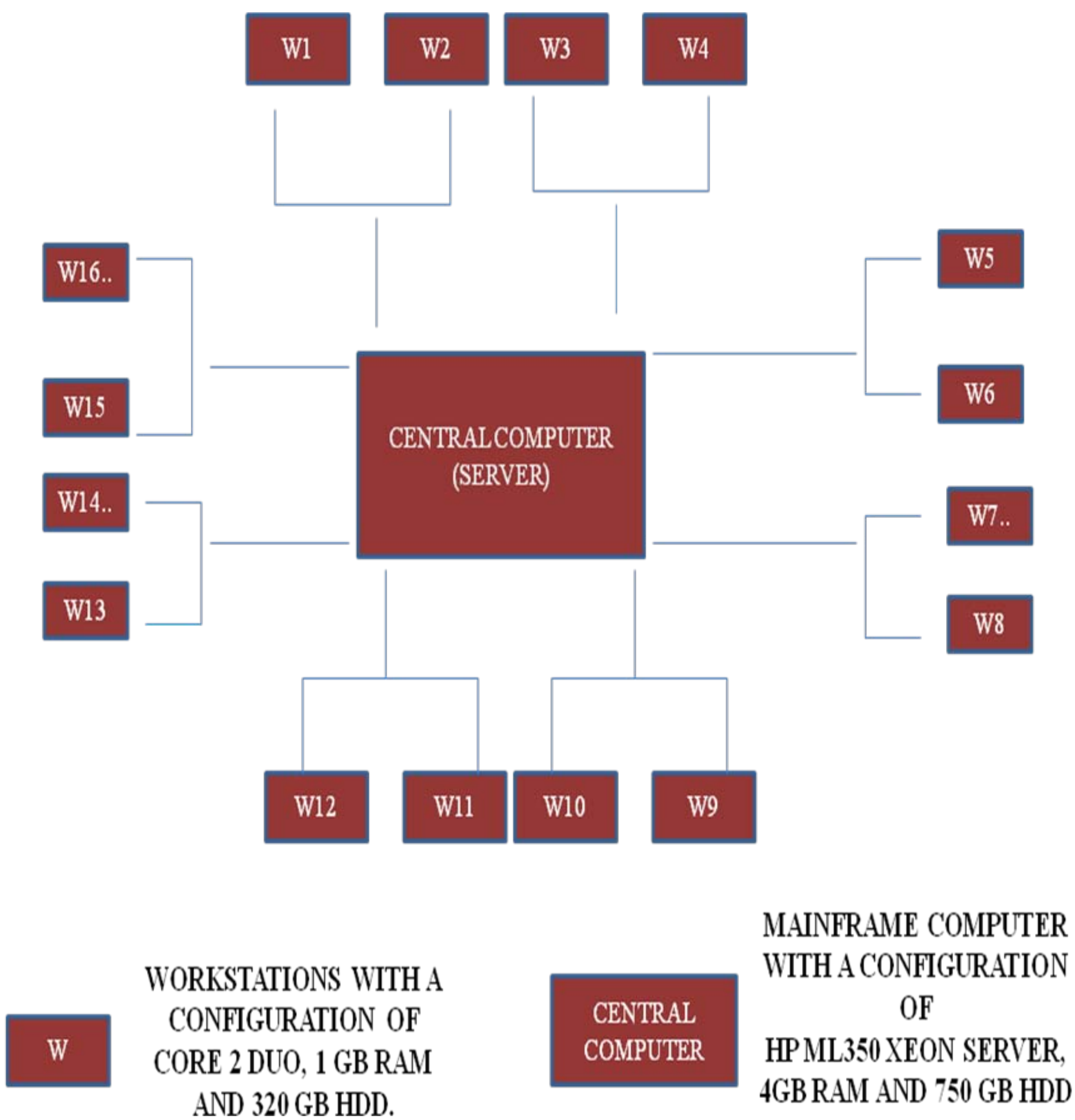
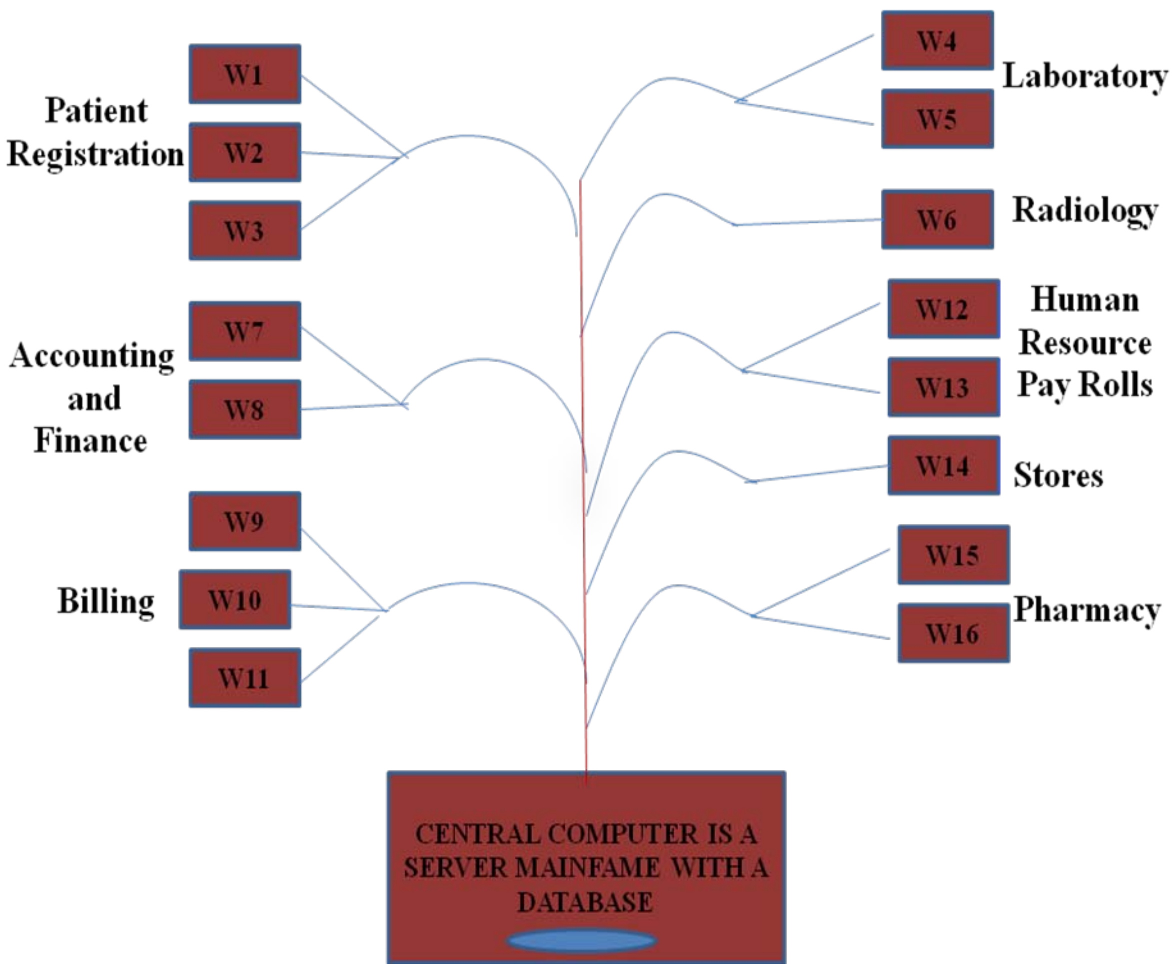


Figure 2 : Detailed Layout Department Wise



- The HP ML350 XEON Server runs ERP software (Aristotle Medics) and workstations are connected through standard networking devices (switches and routers).
- The entire hospital server and workstations are wired through fiber optics.
- The database is maintained in the central server and shared with other departments through network sharing.
- ICD10 Coding is a part of ERP software.
- The Unique Patient Identifiers (UHID) is unique for all the patients approaching the hospital for treatment. i.e. (UHID=RI-11), RI means Registration Information & 11 is the year.
- Every year in the month of March the UHID changes example:-from 2011 to 2012.

(Suppose the current year UHID is RI-12, and then the next year the UHID will be RI-13).

- All the Patients Records are stored at the database software for a period of 15 years and Medico Legal Cases records are stored for life time.
- Backup of the database is stored in External Hard drive which is done every day.
- The fully operations modules are Patient Registration, Accounting and Finance, Billing, Laboratory, Radiology, Human Resource Pay Rolls, Stores and Pharmacy.
- The hospital has an IT department headed by IT manager with supportive team who are available 24 hrs with a resident server administrator.
- Day-to-day operations such as data entry, report generation, stock maintenance etc. are performed by the staff that are trained by the IT department.

Table 1 : Opinion about the existing Hospital Information System

Category (n=100)	Responses			
	Good	Moderate	Poor	Total
Administrative Staff	13	12	5	30
Clinical Staff	8	12	10	30
Non Clinical Staff	9	17	14	40
Total	30	41	29	100

The key findings from the questionnaire were as follows

From Table-1 It is found that only 30% of the respondents agreed that present HIS is good and 41% agreed the present HIS is moderate and 29% had indicated the HIS to be poor.

Table 2 : Opinions About The Characteristics of Present HIS

Questions	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
HIS User Friendliness	10	22	14	26	28
HIS In Enhancing Communication	8	22	20	26	24
HIS In Decision Making	4	16	14	38	28
HIS In Work Efficiency	4	18	2	36	40
HIS Helps In Utilization Of Resources	6	14	14	32	34
HIS Helps In Better Process Flow	6	30	24	32	8
HIS Contribution In Planning	8	28	22	22	20
HIS Role In Cost Containment	8	26	24	20	22
HIS Role In Quality Assurance	10	12	21	28	29
Training For Better Use Of HIS	8	4	10	34	44
A Fully Integrated System	2	4	2	20	72
Seeking Help from IT Department	4	14	8	56	18
Non-Existence Of Computers At All The Wards Effects HIS Performance	6	4	14	28	48
Need For A New And Better System	4	6	14	38	38

Table-2 shows that 32% of the sample disagreed that HIS is not User Friendly to that of 53% of sample agreed that the present HIS is User Friendly, it was also found out that 30% of sample said that HIS is not helpful in Inter-departmental communication and 50% agreed that HIS helps in better communication., it was found out that 66% of staff agreed that HIS helps in Decision Making whereas 20% disagreed, it was found out that 76% of sample agreed that HIS helps in better work efficiency and 22% of the sample disagreed, more over 66% of sample agreed that the Utilization of Resources is effective but 20% disagreed that the utilization of resources is not effective, other findings were 40% of sample agreed that the present HIS helps in better process flow but where as36% of the sample disagreed to it, 42% of sample agreed that HIS contributes in planning and 36% disagreed to this, 42% of sample agreed that HIS plays a vital role in cost containment and 34% of sample disagreed that the present HIS is not effective in cost containment,57% of the sample agreed that HIS plays a key role in Quality Assurance, whereas 22% disagreed to it,78% of sample agreed that Training is needed for better use of HIS, but 12% of sample disagreed that training is not essential,92% of sample agreed that there is a need of fully integrated system whereas, 6% of sample disagreed that a fully integrated system is not needed, 74% of sample agreed that they seek help from IT department but 18% of sample disagreed that they don't need to seek help from IT department for HIS, 76% of sample says that non-existence of computers as wards effects the performance of HIS and 10% of sample disagreed to it, 76% of the sample agreed that there is a need of a new and better system but 10% of sample disagreed.

Table 3 : Classification of Forces according to Force Field Analysis

Motivating Forces	Hindering Forces
User Friendliness	Training
Enhancing Communication	Fully Integrated System
Decision Making	Seeking Help
Work Efficiency	Cost Containment
Resources Utilization	Non-Existence Of Computers
Better Process Flow	
Quality Assurance	

Table-3 and Table-4 Classifies the forces into 2 broad spectrums, i.e. Motivating Forces and Hindering Forces.

Motivating Forces are those forces affecting a situation that are pushing in a particular direction; they are positive forces. In terms of improving the effectiveness in working of HIS the forces that are categorized based on User Friendliness, Enhanced Communication, Decision Making, Work Efficiency, Resources Utilization, Better Process Flow and Quality Assurance.

Hindering Forces are negative forces that decrease the driving forces which lacks in the effectiveness in the operations of HIS. The restraining forces include Training for Employees, Fully Integrated System, Seeking Help, Cost Containment and Non-Existence of Computers.

Table 4 : Force Field Analysis study

Total	Disagree	Agree	+Forces (Motivating Forces) ⇨	-Forces (Hindering Forces) ⇦	Agree	Disagree	Total
86	32	54	User Friendliness	Training	78	12	90
80	30	50	Enhancing Communication	Fully Integrated System	92	6	98
86	20	66	Decision Making	Seeking Help	74	18	92
98	22	76	Work Efficiency	Cost Containment	42	34	76
86	20	66	Resources Utilization	Non-Existence Of Computers	76	10	86
76	36	40	Better Process Flow				
79	22	57	Quality Assurance				

IV. Conclusions

The Global Hospital Information Systems Market is forecast to grow at a Compound Annual Growth Rate of 10% the high growth forecast for the period is significantly influenced by accelerated efforts from the public and private sectors around the world. Hospital Information system is one of the most common computer systems primarily used for communication, store health and administrative information with tremendous growth opportunities towards patient care reducing clinical errors, support health care professionals, increase the efficiency of care improve the quality of patient care. There are Motivating Forces such as. User Friendliness, Enhanced Communication, Decision Making, Work Efficiency, Resources Utilization, Better Process Flow and Quality Assurance which are making staff relay on HIS while some Hindering Forces like Training for Employees, Fully integrated system; Seeking Help, Cost Containment and Non-Existence of Computers are acting as barriers.

V. Acknowledgments

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Modeling a Secured Digital Image Encryption Scheme Using a Three Moduli Set

By B. A. Weyori, P. N. Amponsah & P. K. Yeboah
Catholic University College of Ghana, Fiapre-Sunyani, Ghana

Abstract - This paper proposes a new digital image coding scheme that uses a three moduli set with a common factor. The proposed scheme is specific to a particular three moduli set {2n+2, 2n+1,2n}. The design of the scheme is based on the residue to binary converter which achieves in terms of area and critical path delay as compared to the state of the art. This scheme offers high-speed processing because in the reverse converter the computation of the multiplicative inverse is eliminated, and it achieves low-power VLSI implementation for image processing such as digital image transform and digital image filtering.

Keywords : RNS, VLSI, image coding, CRT, multiplicative inverse, binary number system, converters, moduli set, critical path delay.

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Keywords : RNS, VLSI, image coding, CRT, multiplicative inverse, binary number system, converters, moduli set, critical path delay.

I. Introduction

Data encryption is important to the security and integrity of information to be transmitted through a network. The need for a secured communication is more profound than ever, recognizing the fact that the conduct of almost all our business and personal matters are carried out today by computer networks [1]. Hence, in an environment where data encryption applications are fast-evolving, an algorithm that offers efficient and low-complexity encryption can provide security for information against intrusion and sophisticated threats that abound now. Moreover, the information that has to be transmitted must be encrypted to reduce the size of the data and increase processing speed.

As part of the information transmission, images are extensively used in such fields as desktop publishing, medical imaging, military target analysis, manufactured automation control, machine vision, geo-physical imaging, graphic arts and multimedia [1]. The application of these image features is so dependent on the type of hardware required for high performance that very large scale integration (VLSI) technology becomes vital for digital image processing [2].

One method of designing high-speed and low power VLSI digital systems is by using the residue number system (RNS) [2]. The RNS has such inherent features as parallelism modularity, fault tolerance and carry-free propagation. These features make RNS widely used in Digital Signal Processing (DSP) application such as digital filtering, convolution, Fast Fourier Transform (FFT) and image processing [3],[4],[5]. Thus, RNS is the best tool to employ for a secured, fast and successful image data or image pixels or image elements encryption method.

A two-dimensional image function can be viewed as f(x,y), where x and y are spatial (plane) coordinates and f is the amplitude at any pair coordinate (x,y), called the intensity or gray level of an image at that point. When x,y and the amplitude values are all finite or discrete quantities, the object so formed is a digital image [6],[7].

In this paper, we present an image coding scheme which is based on the residue to binary converter for the three moduli set {2n+2,2n+1,2n} presented in [3]. The image coding scheme achieves speed and area in terms of security.

To clarify this framework, this study gives some background to the image processing scheme, which leads to the proposed coding techniques. The study concludes from an analysis of the encoding and decoding process.

II. Backround

Images are coded and processed to produce results that are more secured and protected than the original images for specific applications. Hence the best approach for achieving a secured, high-speed and low-power VLSI implementation for digital image coding and processing is by the use of the residue number system (RNS) [1],[2]. A residue number system is defined in terms of a relatively prime moduli set $\{m_i\}_{i=1,\dots n}$ such that $\gcd(m_i, m_j) = 1$ for ≠j, where gcd means greatest common divisor of m_i and m_j, while $M = \Pi_{i=1}^{n} m_i$, is the dynamic range. The residues of a decimal number can be obtained as $x_i = |X|_{m_i}$ thus X can be represented in RNS as X= $(x_1, x_2, x_3, \dots x_n)$, $0 \le x_i < m_i$. This representation is unique for any integer in RNS, $X \in [0, M-1]$. In this paper, $X \bmod m_i$ will be represented as $|X|_{m_i}$.

Furthermore, RNS is a carry-free system for addition, subtraction and multiplication operations. Given two integer numbers K and L, RNS is represented

Author α : Faculty of Information and Communication Sciences and Technology, Catholic University College of Ghana, Fiapre-Sunyani, Ghana.

by $K=(k_1,k_2,k_3,...k_n)$ and $L=(l_1,l_2,l_3,...l_n)$ respectively. In this case, we use the operator Θ for addition, subtraction and multiplication. Thus, we calculate $W=K\Theta L$ as $W=(w_1,w_2,w_3,...w_n)$, where $w_i=|k_i \Theta l_i|_{m_i}$, for i=1,n. The complexity of the calculation of this operation Θ is determined by the number of bits required to represent the residue and not by the one required to represent the input operands [3], [7], [8].

This RNS system achieves high speed computation because of its parallel computing nature. In order to convert numbers from binary to residue numbers, a residue-to-binary converter is required at the front end. Then, to convert back from residue to binary a residue-to-binary converter is required at the back end. The residue-to-binary converter usually consists of a lot of moduli operations; the computation of which is tedious. The reverse converter (residue-to-binary) is a crucial part of the RNS system. To perform the conversion of residue-to-binary, that is convert the residue number $(x_1,x_2,x_3,...x_n)$ into the binary number X, the traditional CRT is used [1][2][9],[10]. The traditional CRT is shown in equation (1):

$$X=\left|\sum_{i=1}^{n} M_i \left|M_i^{-1} x_i\right|_{m_i}\right|_M \qquad (1)$$

Where $M=\prod_{i=1}^{n} m_i$, $M_i=\frac{M}{m_i}$, and M_i^{-1} is the multiplicative inverse of M_i with respect to m_i. The moduli set, $\{m_i\}_{i=1,...n}$, must be pairwise and relatively prime for the equation (1) to be used. In this case, the moduli set {2n+2, 2n+1,2n} has a common factor. This simply implies that for equation (1) to be used in the conversion back to binary the moduli set must be mapped to a set of relatively prime moduli. Hence the decimal conversion of $(x_1,x_2,x_3,...x_n)$ for the moduli set which are not pairwise relatively prime can be computed as follows [3], [6]:

$$X=\left|\sum_{i=1}^{n} \alpha_i x_i\right|_{M_L} \qquad (2)$$

Where M_L is the Lowest Common Multiple (LCM) of $\{m_i\}_{i=1,...n}$, the set of moduli sharing a common factor, X is the decimal equivalent of $\{x_i\}_{i=1,...n}$, α_i is an integer such that $|\alpha_i|_{\frac{M_L}{\mu_i}}=0$ and $|\alpha_i|_{\mu_i}=1$, and $\{\mu_i\}_{i=1,...n}$ is a set of integers and such that $M_L=\prod_{i=1}^{n}\mu_i\mu_i$ and divides m_i. It should be taken into consideration that α_i may not exist for some i. The modified form of the equation (2) is shown as equation (3):

$$|X|_{M_L}=\left|\sum_{i=1}^{n}\beta_i\left|\beta_i^{-1}\right|_{\mu_i} x_i\right|_{M_L} \qquad (3)$$

Therefore, a software-based RNS image coding scheme has been proposed as a good tool in image data coding [1][2]. This paper codes the entire image data and so makes it more detailed and achieves a high-speed and low-power VLSI implementation.

III. Proposed Image Encription Scheme

RNS can serve three goals, namely, to increase the speed of transmission, reduce the area of image data, and increase the security level of transmission through computer networks.

a) New Method for Image Data Coding

The image data coding system consists of an encoder and a decoder. The moduli set {2n+2, 2n+1,2n}, which has a common factor is used for the image coding scheme. The encoder is built by a R/B converter, which requires an RNS image processor of small wordlength. The decoder is used to recover the encrypted bitstream according to the moduli set and the proposed conversion technique in [3]. The modified RNS-to-Binary conversion method does not require the computation of a multiplicative inverse and also reduces the problem of the large modulo M as compared to the conversion using the traditional CRT. Considering the reduction in the large **mod-M** to **mod-n** and the elimination of the computation of the multiplicative inverse the proposed image coding scheme achieves reduced area, increased speed and decrease in internal delay of the conversion from RNS to binary.

b) Security of the Proposed Coding Scheme

Compared to the binary image coding, the proposed RNS image coding scheme has an encoder and a decoder, which is designed based on the operation of a three moduli set with a common factor. The end results of the RNS image encoder in this new scheme are in small-wordlength and are arranged into a certain encrypted order. An intruder who breaks into the network does not know the moduli set and the order of the encrypted bitstream that are computed in parallel. Only the designed decoder with the correct R/B converter and moduli set can recognize and decode the encrypted bitstream back to the processed and transformed digital image data according to the way they are arranged.

The proposed scheme achieves high-speed and low-power VLSI implementation for image processing such as digital image transform and digital image filtering. The design of the scheme is based on the residue to binary converter presented in [1] as shown below:

Theorem 1: Given the moduli set (m_1, m_2, m_3) and the dynamic range $M = P_1 P_2 P_3$, the residue number (x_1, x_2, x_3) is converted into binary number by:

$$X = (x_2 - x_1)m_1 + x_1 + m_1 m_2 \left| \frac{(x_1 + x_3)}{2} - x_2 \right|_{\frac{m_3}{2}} \qquad (4)$$

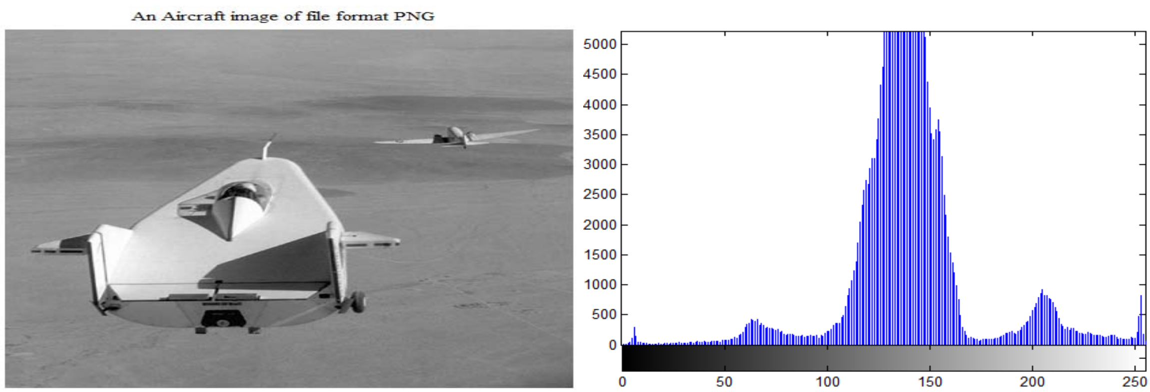

Fig. 1 : An Original image of an Aircraft and A histogram showing the distribution of the image pixels

Table 1 : A representation of a 12-by-12 image data extracted out of the aircraft image data of size 512 by 512

154	153	155	155	153	154	154	155	154	152	155	154
156	156	157	155	153	155	155	154	156	156	158	157
156	159	160	154	153	155	153	155	155	156	157	156
158	161	157	158	157	157	159	155	156	157	160	159
159	161	158	159	160	161	156	155	156	158	158	156
156	158	157	160	158	158	158	156	154	156	157	156
158	158	158	156	157	157	154	154	155	153	152	155
156	155	155	153	156	154	155	154	153	157	153	153
155	155	154	154	157	157	156	155	158	160	158	157
156	159	158	159	157	157	155	157	160	158	156	158
157	157	157	159	156	156	156	157	160	159	156	158
153	156	158	158	160	157	156	158	159	159	156	156

The conversion was done using n=3, since the dynamic range of the grayscale image is 255, using the moduli set {2n +2, 2n + 1, 2n}, the moduli set will form {8, 7, 6}.

Table 2 : Conversion of 12-by-12 decimal image pixels to RNS with moduli 2n + 2

2	1	3	3	1	2	2	3	2	0	3	2
4	4	5	3	1	3	3	2	4	4	6	5
4	7	0	2	1	3	1	3	3	4	5	4
6	1	5	6	5	5	7	3	4	5	0	7
7	1	6	7	0	1	4	3	4	6	6	4
4	6	5	0	6	6	6	4	2	4	5	4
6	6	6	4	5	5	2	2	3	1	0	3
4	3	3	1	4	2	3	2	1	5	1	1
3	3	2	2	5	5	4	3	6	0	6	5
4	7	6	7	5	5	3	5	0	6	4	6
5	5	5	7	4	4	4	5	0	7	4	6
1	4	6	6	0	5	4	6	7	7	4	4

Table 3 : Conversion of 12-by-12 decimal image pixels to RNS with moduli 2n + 1

0	6	1	1	6	0	0	1	0	5	1	0
2	2	3	1	6	1	1	0	2	2	4	3
2	5	6	0	6	1	6	1	1	2	3	2
4	0	3	4	3	3	5	1	2	3	6	5
5	0	4	5	6	0	2	1	2	4	4	2
2	4	3	6	4	4	4	2	0	2	3	2
4	4	4	2	3	3	0	0	1	6	5	1
2	1	1	6	2	0	1	0	6	3	6	6
1	1	0	0	3	3	2	1	4	6	4	3
2	5	4	5	3	3	1	3	6	4	2	4
3	3	3	5	2	2	2	3	6	5	2	4
6	2	4	4	6	3	2	4	5	5	2	2

Table 4 : Conversion of 12-by-12 decimal image pixels to RNS with moduli 2n

4	3	5	5	3	4	4	5	4	2	5	4
0	0	1	5	3	5	5	4	0	0	2	1
0	3	4	4	3	5	3	5	5	0	1	0
2	5	1	2	1	1	3	5	0	1	4	3
3	5	2	3	4	5	0	5	0	2	2	0
0	2	1	4	2	2	2	0	4	0	1	0
2	2	2	0	1	1	4	4	5	3	2	5
0	5	5	3	0	4	5	4	3	1	3	3
5	5	4	4	1	1	0	5	2	4	2	1
0	3	2	3	1	1	5	1	4	2	0	2
1	1	1	3	0	0	0	1	4	3	0	2
3	0	2	2	4	1	0	2	3	3	0	0

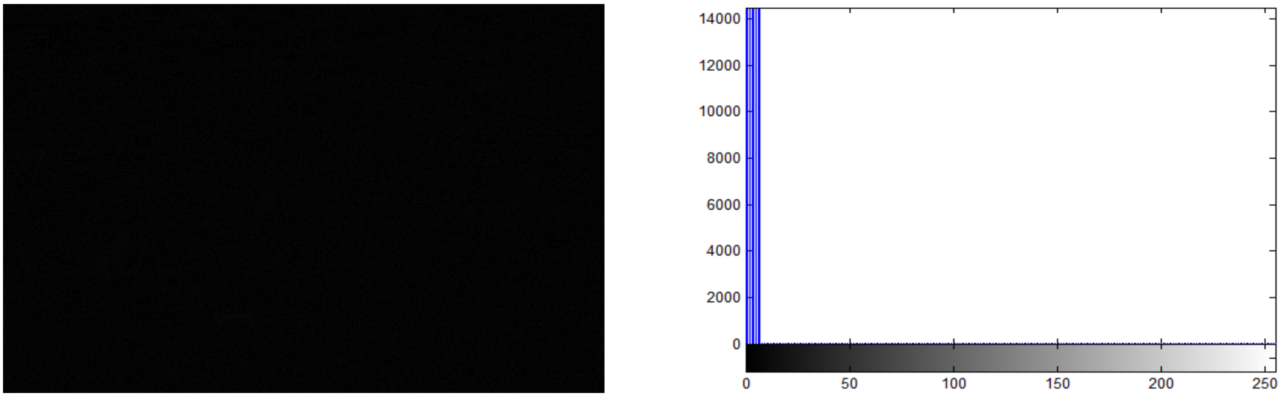

Fig. 2 : An encrypt image of an Aircraft with moduli set 2n + 2 and A histogram showing the distribution of the encrypted image pixels

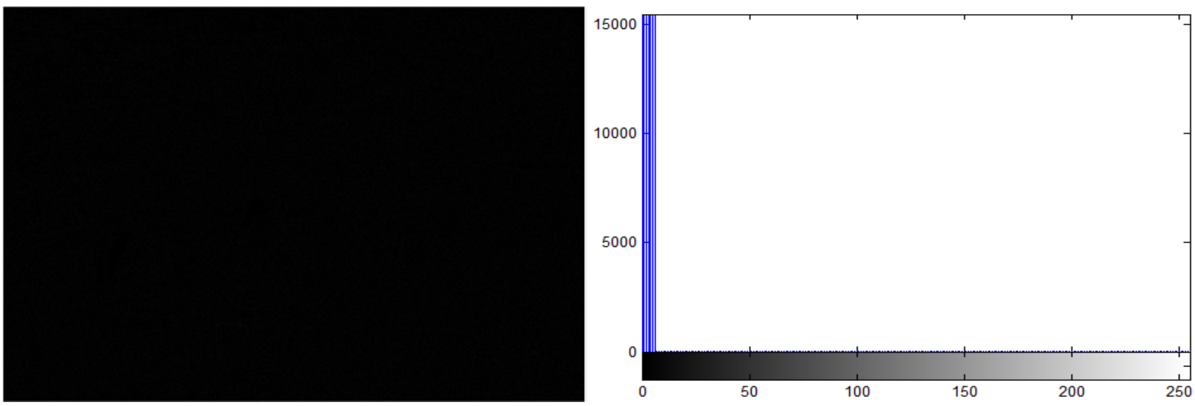

Fig. 3 : An encrypt image of an Aircraft moduli set 2n +1 and A histogram showing the distribution of the encrypted image pixels

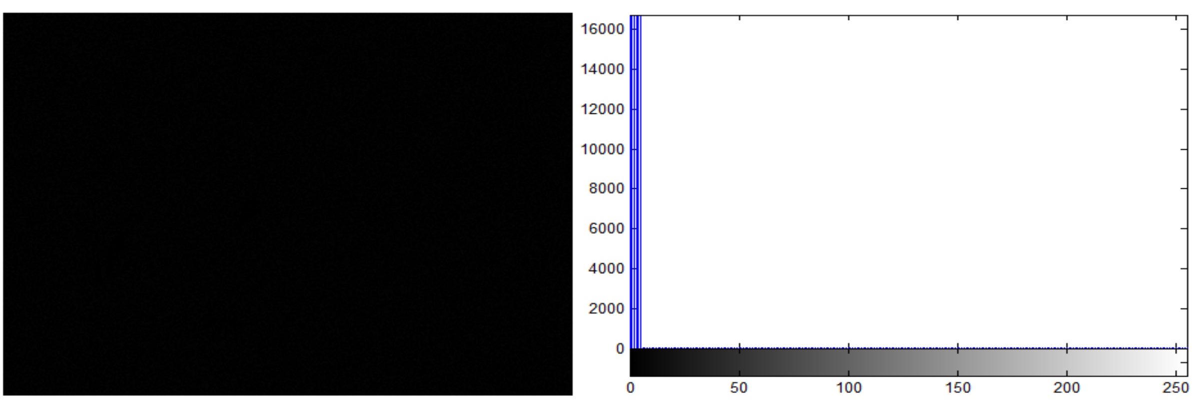

Fig. 4 : An encrypt image of an Aircraft moduli set 2n and A histogram showing the distribution of the encrypted image pixels

Example 1: Given the moduli set {2n +2, 2n +1, 2n} and modulis $(2,0,4)$. Convert the encrypted pixel bitstream from RNS-to-Binary using the proposed technique in [1]. Where n = 3.

$m_1 = 8, m_2 = 7, m_3 = 6, x_1 = 2, x_2 = 0$ and $x_3 = 4$

$$X = (0-2)8 + 2 + (8\times 7)\left|\frac{(2+4)}{2} - 0\right|_{\frac{8}{2}}$$

$$X = (-2)8 + 2 + 56\left|\frac{6}{2}\right|_4$$

$$X = -16 + 2 + 56(3)$$

$$X = 154$$

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IV. Encoder and Decoder

The designed system is divided into two parts. The first part deals with the encoding that is mainly carried out by the encoder (B/R converter). The second part involves the decoding, which is implemented by the decoder (R/B converter).

a) Encoder

1. Read the original digital image signal as binary or decimal value.
2. The digital image data or elements are encrypted into bitstream in a certain order according to the moduli set.
3. The encrypted bitstream is processed by the RNS image processor and the output is sent.

b) Decoder

1. The processed encrypted bitstream (digital image data encoded with RNS) is received and recognized.
2. The decoder with the correct moduli set is used to decode the encrypted bitstream back to binary or decimal so that it is easily read by the computer.

Fig. 1 : Encoder

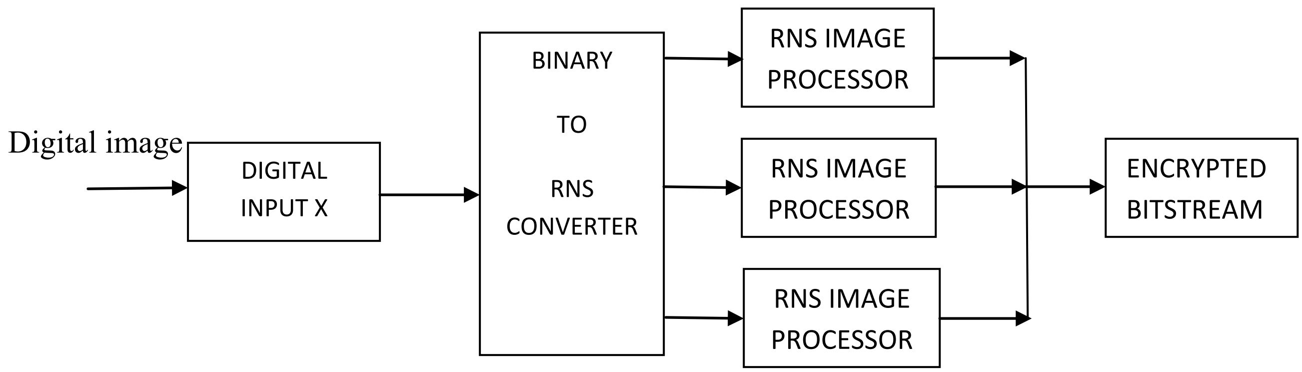

Fig. 2 : Decoder

V. Conclusion

Data encryption is the process of transforming information (referred to as plaintext) using an algorithm (called a cipher) to make it unreadable to anyone except those possessing special knowledge, usually referred to as a key. The result of the process is encrypted information (in cryptography, referred to as cipher text). The reverse process, i.e. to make the encrypted information readable again is referred to as decryption, (i.e. to make it unencrypted).

In this paper, we built an encryption and decryption scheme based on a three moduli set. We demonstrated the security strengths of the encryption scheme. The proposed scheme outperforms most of the encryption schemes in terms of area and delay due to the fact that our scheme operates on smaller magnitude operands as it requires less complex adders and multipliers, which potentially offers high-speed processing.

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Study and Analysis of Ant System

By Pawandeep Chahal
Desh Bhagat Institute of Engg. & Management, Moga

Abstract – A lot of species of ants have a trail-laying/trailfollowing behavior when foraging. While moving, individual ants deposit on the ground a volatile chemical substance called pheromone, forming in this way pheromone trails. Ants can smell pheromone and, when choosing their way, they tend to choose, in probability, the paths marked by stronger pheromone concentrations. In this way they create a sort of attractive potential field, the pheromone trails allows the ants to find their way back to food sources (or to the nest). Also, they can be used by other ants to find the location of the food sources discovered by their nest mates.

GJCST-E Classification: I.6.4

STUDY AND ANALYSIS OF ANT SYSTEM

Strictly as per the compliance and regulations of:

Study and Analysis of Ant System

Pawandeep Chahal

I. Ant System

A lot of species of ants have a trail-laying/trail-following behavior when foraging. While moving, individual ants deposit on the ground a volatile chemical substance called pheromone, forming in this way pheromone trails. Ants can smell pheromone and, when choosing their way, they tend to choose, in probability, the paths marked by stronger pheromone concentrations. In this way they create a sort of attractive potential field, the pheromone trails allows the ants to find their way back to food sources (or to the nest). Also, they can be used by other ants to find the location of the food sources discovered by their nest mates.

a) Binary bridge experiment with same branch length

Let us consider first the binary bridge experiment [20] whose setup is shown in Figure 1 (a). The nest of a colony of Argentine ants Linepithema humile and a food source have been separated by a diamond-shaped double bridge in which each branch has the same length. Ants are then left free to move between the nest and the food source. The percentage of ants which choose one or the other of the two branches is observed over time. The result in Figure 1 (b) is that after an initial transitory phase lasting few minutes during which some oscillations can appear, ants tend to converge on a same path.

In this experiment initially there is no pheromone on the two branches, which are therefore selected by the ants with the same probability. Nevertheless, after an initial temporary phase, random fluctuations cause a few more ants to randomly select one branch, the upper one in the experiment shown in Figure 1 (a). Since ants deposit pheromone while walking back and forth the greater number of ants on the upper branch determines a greater amount of pheromone on it, which in turn stimulates more ants to choose it, and so on in a circular way.

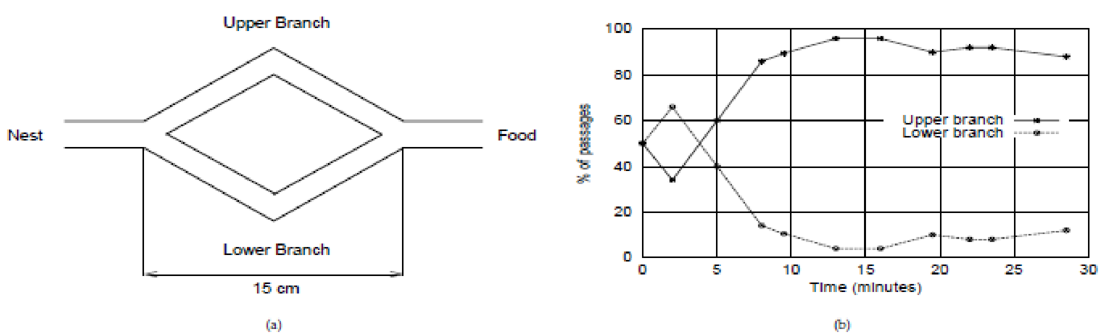


Figure 1 : Binary bridge experiment with same branch length. (a) Experimental setup. (b) Results for a typical single trial [20]

To describe this convergent behavior of the ants, the experiment has proposed a probabilistic model which closely matches the experimental observations. It is assumed that the amount of pheromone on a branch is proportional to the number of ants which have been using the branch in the past. This assumption implies that the pheromone trail is persistent, that is, pheromone trail does not evaporate. Given that an experiment typically lasts approximately one hour, it is plausible to assume that the amount of pheromone evaporated in this time period is negligible. For longer durations, pheromone evaporation must be taken into account. In the model, the probability of choosing a branch at a certain time depends on the total amount of pheromone on the branch, which, in turn, is proportional to the number of ants which have used the branch until that moment. More precisely, let U_m and L_m be the numbers of ants which have used the upper and lower branch after a total of m ants have crossed the bridge, $U_m + L_m = m$. The probability $P_U(m)$ with which the (m + 1)th ant chooses the upper branch is

$$P_U(m) = \frac{(U_m+k)^h}{(U_m+k)^h+(L_m+k)^h} \quad (2.1)$$

While the probability $P_L(m)$ that the ant chooses the lower branch is

Author : *Research Scholar, CMJ University, Shillong , Meghalaya, Asst. Prof, Department of IT, Desh Bhagat Institute of Engg. & Management, Moga.*

$$P_L(m) = 1 - P_U(m) \tag{2.2}$$

This functional form for the probability of choosing a branch over the other was obtained from experiments on trail following [62]; the parameters h and k allow to fit the model to experimental data. The dynamics regulating the ant choices follows from the above equation:

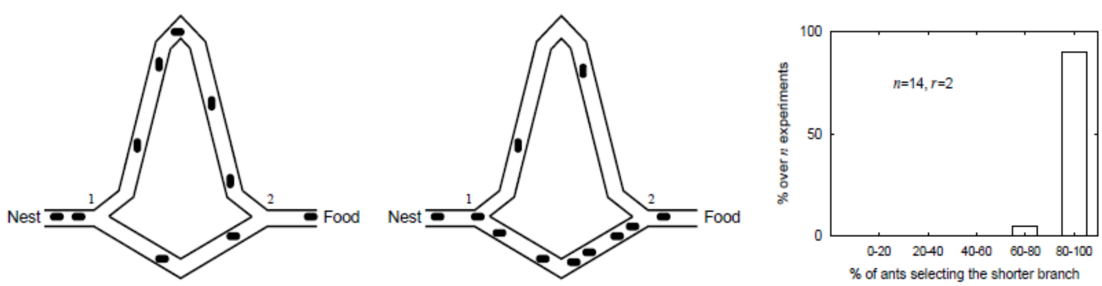
$$\begin{cases} U_m + 1 = U_m + 1, & if\ \psi \le P_U \\ U_m + 1 = U_m, & otherwise \end{cases} \tag{2.3}$$

Where ψ is a random variable uniformly distributed over the interval [0,1]. Monte Carlo simulations were run to test the correspondence between this model and the real data: results of simulations were in agreement with the experiments with real ants when parameters were set to k≈20 and h≈2 [62].

b) Binary bridge experiment with different branch length

The previous experiment shows how the presence of pheromone affects in general the ant decisions and constrains the foraging behavior of the colony as a whole. If the branches of the bridges are of different length, then the pheromone field can lead the majority of the ants in the colony to select the shortest between the two available paths. In this case, the first ants able to arrive at the food source are those that traveled following the shortest branch (as in Figure 2.2). Accordingly, the pheromone that these same ants have laid on the shortest branch while moving forward towards the food source makes this branch marked by more pheromone than the longest one. The higher levels of pheromone present on the shortest branch stimulate these same ants to probabilistically choose again the shortest branch when moving backward to their nest. This recursive behavior can be thoroughly described as an autocatalytic effect because the very fact of choosing a path increases its probability of being chosen again in the near future.

During the backward journey, additional pheromone is released on the shortest path. In this way, pheromone is laid on the shortest branch at a higher rate than on the longest branch. This reinforcement of the pheromone intensity on the shorter paths is the result of a form of implicit path evaluation: the shorter paths are completed earlier than the longer ones, and therefore they receive pheromone reinforcement more quickly. Therefore, for a same number of ants choosing either the shortest or the longest branch at the beginning, since the pheromone on the shortest branch is accumulated at a higher rate than on the longest one, the choice of the shortest branch becomes more and more attractive for the subsequent ants at both the decision points. The experimental observation is that, after a transitory phase which can last a few minutes, most of the ants use the shortest branch. It is also observed that the colony's probability of selecting the shortest path increases with the difference in length between the long and the short branches.



(a) (b) (c)

Figure 2 : Experiment with different branch length. (a) Ants start exploring the bridge. (b) Eventually most of the ants choose the shortest path. (c) Distribution of the percentage of ants that selected the shorter branch

In this experiment, the importance of initial random fluctuations is much reduced with respect to the previous experiment. In Figure2 (a) – (b) are shown, together with the experimental apparatus, the typical result of an experiment with a bridge with branches of different lengths. Figure 2 (c) shows the distribution of the results over n=14 experiments for the case of a bridge in which the length r=2 of the longer branch is twice that of the shorter one.

Figure 2.3 shows in a schematic way how the effect of round-trip pheromone laying/sensing can easily determine the convergence of all the ants on the shortest between two available paths. At time t = 0 two ants leave the nest looking for food. According to the fact that no pheromone is present on the terrain at the nest site, the ants select randomly the path to follow. One ant chooses the longest and one the shortest path bringing to the food. After one time unit, the ant that chose the shortest path arrives at the food reservoir. The other ant is still on its way. The intensity levels of the pheromone deposited on the terrain are shown; where the intensity scale on the right says that a darker color means more pheromone. Pheromone evaporation is considered as negligible according to the time duration of the experiment.

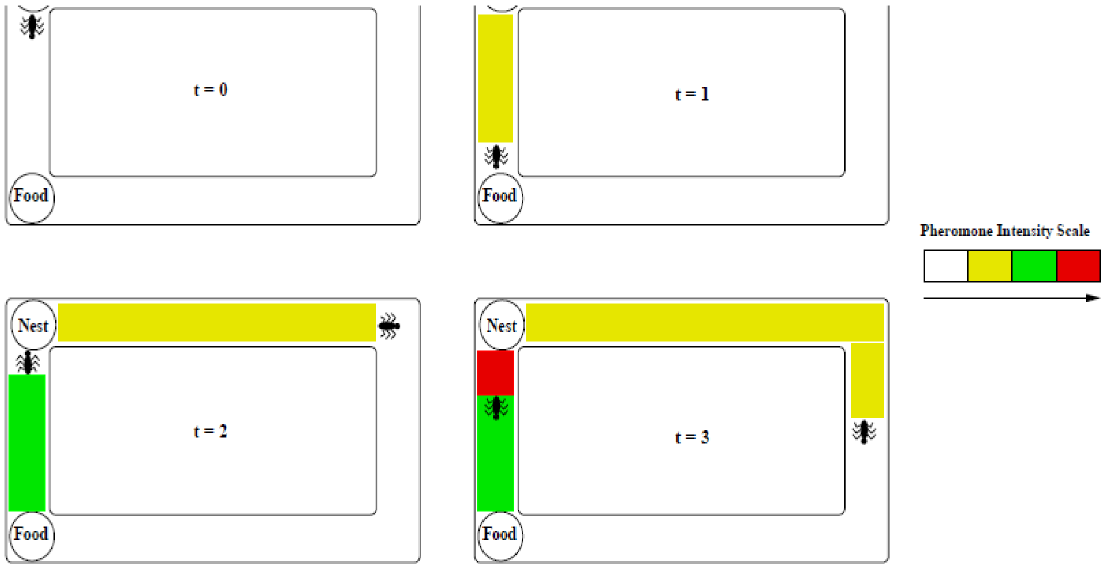


Figure 2.3 : Example of how the effect of laying/sensing pheromone during the forward and back journeys from the nest to food sources can easily determine the convergence of all the ants of the colony to the shortest between two available paths

The ant already arrived at the food site must select the way to go back to the nest. According to the intensity levels of the pheromone near the food site, the ant decides to go back by moving along the same path, but in the opposite direction. Additional pheromone is therefore deposited on the shortest branch. At $t = 2$ the ant is back to the nest, while the other ant is still moving toward the food along the longest path. At $t = 3$ another ant moves from the nest looking for food. Again, he/she selects the path according to the pheromone levels and, therefore, it is biased toward the choice of the shortest path. It is easy to imagine how the process iterates, bringing, in the end, the majority of the ants on the shortest path.

II. Robustness and Adaptivity

Even if it is not always true that the shortest path behavior will arise, it is often the case that alternative non-random, self-organized, global patterns of activity will arise. That is, under reasonable conditions (e.g., environmental conditions are not such that pheromone evaporates faster than the average time necessary for an ant to reach the target), some interesting regular patterns can be eventually observed. This fact witnesses the overall robustness of the mechanisms at work in ant colonies, as well as the fact that they are able to produce an interesting variety of different organized behaviors. These are key properties in real-world environments, which require robustness, adaptivity and the ability to provide satisfactory responses to a range of possible different situations.

The general robust collective behavior of ant colonies with respect to variations in the values of the external conditions is a key-aspect of their biological success. They, like other classes of social insects, are crystalline examples of natural complex adaptive systems that the evolutionary pressure has made sufficiently robust to a wide range of external variations.

III. Connection-Oriented and Connectionless Protocols

Protocols can be either connection-oriented or connectionless in nature. In connection-oriented protocols, corresponding entities maintain state information about the dialogue they are engaged in. This connection state information supports error, sequence and flow control between the corresponding entities. The windowing scheme presented earlier is an example of a connection-oriented protocol.

Error control refers to a combination of error detection (and correction) and acknowledgment sufficient to compensate for any unreliability inherent to the channel. Sequence control refers to the ability for each entity to reconstruct a received series of messages in the proper order in which they were intended to be received; this is essential to being able to transmit large files across dynamically-routed mesh networks. Flow control refers to the ability for both parties in a dialogue to avoid overrunning their peer with too many messages. Connection-oriented protocols operate in three phases. The first phase is the connection setup phase, during which the corresponding entities establish the connection and negotiate the parameters defining the connection. The second phase is the data transfer phase, during which the corresponding entities exchange messages under the auspices of the connection. Finally, the connection release phase is when the correspondents "tear down" the connection because it is no longer needed.

Networks may be divided into different types and categories according to four different criteria:

a) Geographic spread of nodes and hosts

When the physical distance between the hosts is within a few kilometers, the network is said to be a **Local Area Network** (LAN). LANs are typically used to connect a set of hosts within the same or a set of closely-located buildings). For larger distances, the network is said to be a **Metropolitan Area Network** (MAN) or a **Wide Area Network** (WAN). MANs cover distances of up to a few hundred kilometers and are used form interconnecting hosts spread across a city. WANs are used to connect hosts spread across a country, a continent, or the globe. LANs, MANs, and WANs usually coexist: closely-located hosts are connected by LANs which can access hosts in other remote LANs via MANs and WANs.

b) Access restrictions

Most networks are for the private use of the organizations to which they belong; these are called **private networks**. Networks maintained by banks, insurance companies, airlines, hospitals, and most other businesses are of this nature. **Public networks**, on the other hand, are generally accessible to the average user, but may require registration and payment of connection fees. Internet is the most-widely known example of a public network. Technically, both private and public networks may be of LAN, MAN, or WAN type, although public networks, by their size and nature, tend to WANs.

c) Communication model employed by the nodes

The communication between the nodes is either based on a **point-to-point** model or a **broadcast** model. In the point-to-point model, a message follows a specific route across the network in order to get from one node to another. In the broadcast model, on the other hand, all nodes share the same communication medium and, as a result, a message transmitted by any node can be received by all other nodes. A part of the message (an address) indicates for which node the message is intended. All nodes look at this address and ignore the message if it does not match their own address.

d) Switching model employed by the nodes

In the point-to-point model, nodes either employ **circuit switching** or **packet switching**. Suppose that a host A wishes to communicate with another host B. In circuit switching, a dedicated communication path is allocated between A and B, via a set of intermediate nodes. The data is sent along the path as a continuous stream of bits. This path is maintained for the duration of communication between A and B, and is then released. In packet switching, data is divided into packets (chunks of specific length and characteristics) which are sent from A to B via intermediate nodes. Each intermediate node temporarily stores the packet and waits for the receiving node to become available to receive it. Because data is sent in packets, it is not necessary to reserve a path across the network for the duration of communication between A and B. Different packets can be routed differently in order to spread the load between the nodes and improve performance. However, this requires packets to carry additional addressing information.

IV. Data Communication and Networking

The major criteria that a Data Communication Network must meet are:

i. Performance
ii. Consistency
iii. Reliability,
iv. Recovery and
v. Security

V. Performance

Performance is the defined as the rate of transferring error free data. It is measured by the Response Time. Response Time is the elapsed time between the end of an inquiry and the beginning of a response. Request a file transfer and start the file transfer. Factors that affect Response Time are:

a. Number of Users: More users on a network - slower the network will run
b. Transmission Speed: speed that data will be transmitted measured in bits per second (bps)
c. Media Type: Type of physical connection used to connect nodes together
d. Hardware Type: Slow computers such as XT or fast such as Pentiums
e. Software Program: How well is the network operating system (NOS) written

VI. Consistency

Consistency is the predictability of response time and accuracy of data.

a. Users prefer to have consistent response times, they develop a feel for normal operating conditions. For example: if the "normal" response time is 3 sec. for printing to a Network Printer and a response time of over 30 sec happens, we know that there is a problem in the system!
b. Accuracy of Data determines if the network is reliable! If a system loses data, then the users

will not have confidence in the information and will often not use the system.

VII. Reliability

Reliability is the measure of how often a network is useable. MTBF (Mean Time Between Failures) is a measure of the average time a component is expected to operate between failures. Normally provided by the manufacturer. A network failure can be: hardware, data carrying medium and Network Operating System.

VIII. Recovery

Recovery is the Network's ability to return to a prescribed level of operation after a network failure. This level is where the amount of lost data is nonexistent or at a minimum. Recovery is based on having Back-up Files.

IX. Security

Security is the protection of Hardware, Software and Data from unauthorized access. Restricted physical access to computers, password protection, limiting user privileges and data encryption are common security methods. Anti-Virus monitoring programs to defend against computer viruses are a security measure.

X. Network Hierarchy

A general world-wide communication network consists of three parts as an access network that offers connectivity to residential users, an edge network that combines several access networks (and possibly corporate networks) and a core network (or the backbone). Important access networks are the residential telephony network, cable TV network, ADSL network and the mobile networks as GSM and Wireless LANs. As core networks, we mention the international telephony trunks and the Internet backbone(s). Edge networks lie in between and are not clearly defined but only relatively with respect to the access and the core network. The large differences in throughput and other quantities demonstrate the need for different network management and underlying physical transmission technologies.

XI. Types of Communication Interaction

In networking, various types of interactions between communicating parties exist.

XII. Centralized Versus Distributed Control

In a centralized approach, a master is appointed among the systems in a network. The master controls each interaction in the network of these systems. The other alternative, a distributed control consists in using a policy or protocol of communication (e.g. start speaking as soon as someone else stops, but back-off immediately if a third one starts). It is the rule of the protocol that controls distributed interaction.

XIII. Finite state Machine Interaction

A first type of interaction between the set of systems is that driven by a finite state machine. A finite state machine follows and executes rules or actions depending on state of the process. For example, system 2 has just spoken, thus, we move to and poll system 3, and so on. The operation of a finite state machine can be visualized and described by a graph that relates the processes in the different states. A well known example of such a graph is a Petri net.

a) Client-server interaction: "ask-when-needed" or event driven

Another mode of interaction only operates when an inner state or a process in a system requires information from other connected systems. This mode is event driven and called a client-server interaction. For example, when clicking on a link at a webpage, there is a short communication with a server that returns the IP address of the machine on which the content of the intended page is stored. A client-server interaction is thus a relation between processes in which each process can take the initiative to communicate with another process. A particular process is not necessary always client or server, but a process is a client or a server with respect to another process and their role can change over time. Also a process A can be client in the relation with process B, but it can be the server with respect to process C.

The communication in distributed systems needs to be designed to avoid a "deadlock" that is the situation in which processes are waiting infinitely long for each other. The communication relations between all processes in a distributed system can be represented by a graph. Dead-locks can be avoided if that graph is a-cyclic, i.e. the graph does not contain cycles. In an a-cyclic graph or tree, there is only 1 path between each pair of processes. Since a client-server interaction asks a question and waits for the reply (using a single path in the process relation graph), the client-server concept allows to build a dead-lock free architecture of a distributed system. Large and complex distributed systems can be built based on the relatively simple client-server principle.

b) Summary of interaction models

Client-server interaction forms the basis of most network communications and is fundamental because it helps us understand the foundation on which distributed algorithms are built. Usually, there are more clients than servers. Typically, a finite state machine is used when there is little interaction or the interaction is simple such that the number of possible states in the communication protocol is limited.

Client-server interaction is more flexible and suited for intense interaction. Although we may argue that distributed networking is preferable in terms of scalability and robustness the back side of the medal is that distributed networking is more difficult to control and design. For example, distributed routing seems very robust and scalable. In nature, ants find their way individually by using a small set of rules. It seems interesting to transfer the rules deduced from the behavior of ants to communication networking. Apart from finding the minimal set of rules, the demonstration that the ensemble of rules operates correctly for the whole colony of packets in the network is difficult. Further, proving optimality or how close distributed networking lies to a global optimum is generally difficult.

XIV. Communication Modes

In general, four different communication modes can be distinguished: unicast, multicast, broadcast and any cast. Unicast is a communication between two parties (one-to-one) and a typical example is a telephone call. Multicast consists of the modes one-to-many and many-to-many with as example a video-conference. Broadcast defined as a communication from one user to all users in a network is an extreme case of multicast. The typical example is the broadcasting of information for television and radio. Finally, anycast is a communication from one-to-any of a group. For example, when information is replicated over many servers, a user wants to download the information from an arbitrary server of that group. Most often, the anycast mode will point or route the user's request to that server nearest to the user. The user does not need to know the location or the individual addresses of the servers, only the anycast address of the group of servers.

XV. Performance Metrics

In the design of communications networks, the preference of algorithm or implementation A of a network functionality above algorithm B depends on various factors. Beside the monetary cost, the most common technical factors, called performance metrics, are the computation complexity, the throughput, the blocking, the reliability, the security, the memory consumption, and the manageability. In general, the performance metrics for a particular algorithm/implementation are not always easy to compute. The precise definitions, the analysis, and the computation of performance metrics belong to the domain of performance analysis for which we refer to Van Mieghem (2006). Apart from the precise evaluation of the performance of a particular algorithm/ implementation, some of the performance metrics are not yet universally and accurately defined. For example, the reliability or the robustness of a network topology can be evaluated in many different ways. Another frequently appearing term as a design metric is the scalability.

XVI. Scalability

The term "scalability" expresses the increase in the complexity to operate, control or manage a network if relevant network parameters such as the size or the number of nodes/systems in the network, the traffic load, the interaction rate, etc. increase. Whether a property of a network is scalable or not strongly depends on that property itself.

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"Evaluate E-Government Security Strategy by using Fuzzy Logic Techniques"

By P.V.S.S.Gangadhar, Sirigiri Pavani & Dr. R. N. Behera
Dr. C. V. Raman University, Bilaspur, C.G. State

Abstract - The concept of an e-government system is to provide access to government services anywhere at any time over open networks. This leads to issues of security and privacy in the management of the information systems. Ensuring security of e-government applications and infrastructures is crucial to maintain trust among various departments to store, process and exchange information over the e-government systems. Due to dynamic and continuous threats on e-government information security, policy makers need to perform evaluation on existing information security strategy as to deliver trusted and confidence e-government services. This paper presents an information security evaluation framework based on fuzzy logic techniques to help policy makers conduct comprehensive assessment of egovernment security strategy.

Keywords : *E-government, security, fuzzy logic, fuzzy linguistic variables, Fuzzy Inference System, Sensitivity Analysis, Gaussian MF, Fuzzy Rules.*

GJCST-E Classification: *J.1*

EVALUATE E-GOVERNMENT SECURITY STRATEGYBY USING FUZZY LOGIC TECHNIQUES

Strictly as per the compliance and regulations of:

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P.V.S.S.Gangadhar [α], Sirigiri Pavani [σ] & Dr. R. N. Behera [ρ]

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Keywords : E-government, security, fuzzy logic, fuzzy linguistic variables, Fuzzy Inference System, Sensitivity Analysis, Gaussian MF, Fuzzy Rules.

I. Introduction

E-government is about bridging government and citizen communications in more efficient, transparent and reliable ways through effective use of information technology. With the increasing use of Information technology, functions in government and businesses are now increasingly dependent on network of critical information infrastructure. As such, any disruption of the operation of information systems of critical infrastructure is likely to have a devastating effect on people, departmental records, economy, essential human & government services and national security. And also brings back to normality, it takes time.

The Internet has become the main media for e-government from delivering public information to electronic document and financial transactions although it is widely attributed to serious security weaknesses. As a result, security and privacy are the most crucial concerns of any e-government applications. In the view of the potential impact, protection of critical information infrastructure is essential to ensure that disruptions are infrequent, of minimal duration & manageable and cause the least damage possible. Users of information resources must have skills, knowledge, and training to manage information resources, enabling the organizations to effectively serve the customers/users through automated means. Personnel with program delivery responsibilities should recognize the importance of security of information resources and their management to mission performance.

Ensuring security of e-government applications and infrastructures is crucial to maintain trust among in between departments to store, process and exchange information over the e-government systems. Due to dynamic and continuous threats on e- government information security, policy makers need to perform continuous evaluation on existing information security practices and controls. Based on the fact, this paper attempts to propose a holistic approach from managerial decision making perspective by combining all related aspects of security to create a framework used to evaluate e-government security strategy.

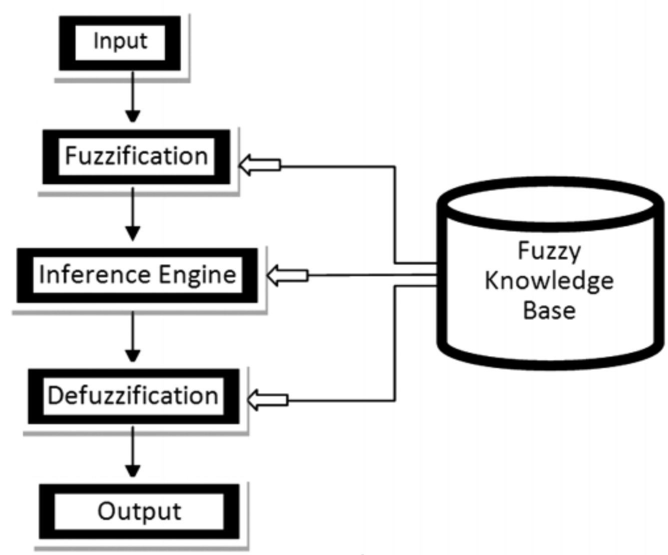


Figure : Input to Output Fuzzification process

There are many factors which account for the increase in question but the most prominent among them is the rapidly growing use of soft computing and especially fuzzy logic in the conception and design of intelligent systems .As one of the principal constituents of soft computing, fuzzy logic is playing a key role in the conception and design of various systems. There are two concepts within fuzzy logic which play a central role in its applications. The first is that of a linguistic variable, i.e., a variable whose values are words or sentences in a natural or synthetic language. The other is that of a fuzzy

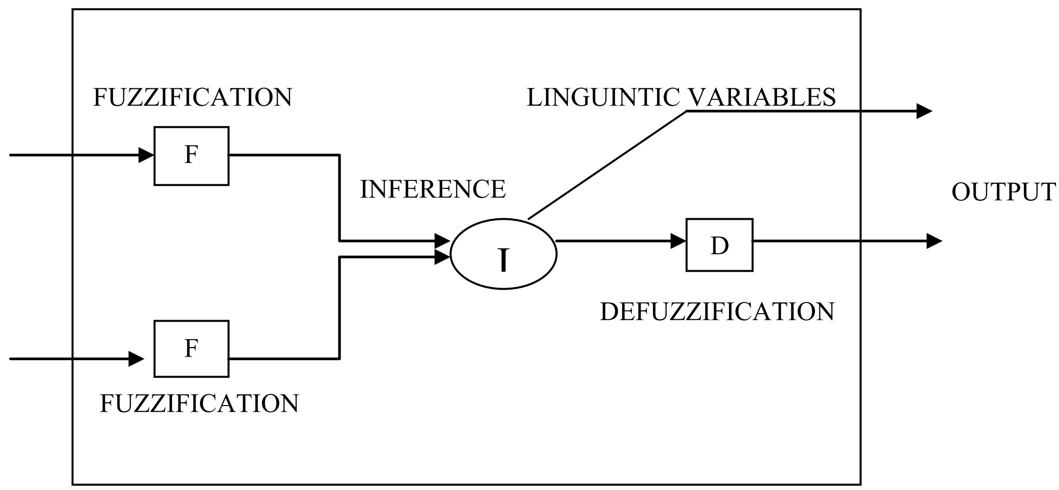
Author α : Scientist "C", NATIONAL INFORMATIC CENTRE (NIC), Ministry of Information Technology & Communications, Government of India. E-mail : pvss.gangadhar@nic.in
Author σ : Research Scholar, Dr. C. V. Raman University, Bilaspur, C.G. State. E-mail : spavanisantosh@gmail.com
Authort ρ : Scientist"E", NIC, Ministry of Information Tech. & Comm., Government of India. E-mail : rnbehera@nic.in

if-then rule in which the antecedent and consequent are propositions containing linguistic variables. The essential function served by linguistic variables is that of granulation of variables and their dependencies. In effect, the use of linguistic variables and fuzzy if-then rules results - through granulation - in soft data compression which exploits the tolerance for imprecision and uncertainty. In this respect, fuzzy logic mimics the crucial ability of the human mind to summarize data and focus on decision-relevant information

Since decision making mostly involve fuzzy logic techniques and alternative to consider altogether, this framework implement fuzzy logic techniques approach to view e-government security strategy from managerial perspective. Fuzzy set theory is applied to complement the framework in order to capture fuzziness in the form of inconsistencies and vagueness coming from subjective judgments by decision makers.

II. Methodology

Fuzzy Logic introduced by Zadeh (1965) gives us a language, with syntax and local semantics, in which we can translate our qualitative knowledge about the problem to be solved. Fuzzy logic is a powerful problem-solving methodology with a myriad of applications in embedded control and information processing. Fuzzy provides a remarkably simple way to draw definite conclusions from vague, ambiguous or imprecise information. In a sense, fuzzy logic resembles human decision making with its ability to work from approximate data and find precise solutions.



a) *Different Membership function*

i. *Straight line*

The simplest membership function is formed by straight line. We consider the speed of car fig (1.1), and plot the membership function for high. Where the horizontal represent the speed of the car and vertical axis represent the membership value for high.

ii. *Trapezoidal*

If we consider the case 1.2 and plot the membership function for "less", we get a trapezoidal membership function. Fig 1.2 shows a graphical representation, where the horizontal axis represent the force applied to the accelerator and the vertical shows membership value for "less". The function is often represented by "trapmf".

iii. *Gaussian*

Let say a fuzzy set Z which represent "number close to zero". The possible membership function for Z is

$$\mu z(x) = e \exp(-x^2) \qquad (1.3)$$

If we plot this function we get a graph shown in fig 1.3 and are refer as Gaussian membership function.

iv. *Triangular*

This is formed by the combination of straight lines. The function is name as "trimf" .We considers the above case i.e. fuzzy set Z to represent the "number close to zero". So mathematically we can also represent it as

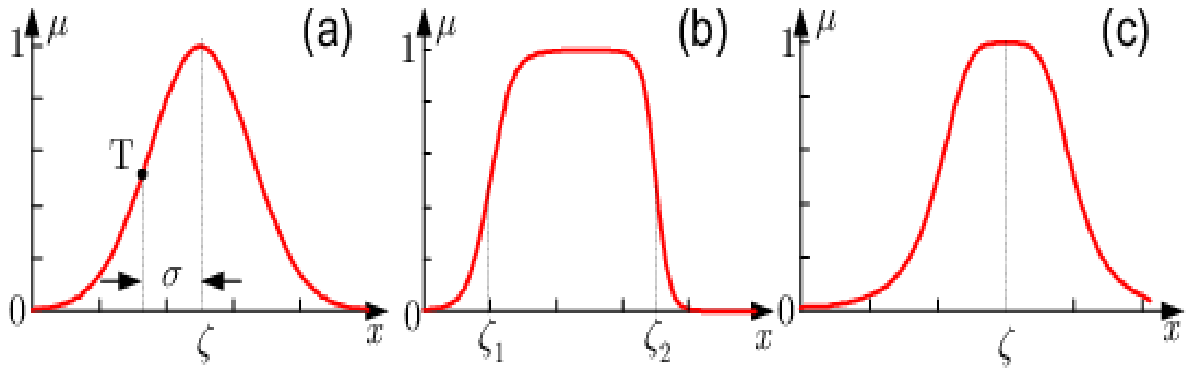
$$0 \text{ if } x<-1$$

$$\mu z(x) = x + 1 \text{ if } -1 \leq x < 0 \ (1.4)$$

$$1 - x \text{ if } 0 \leq x < 1$$

$$0 \text{ if } 1 \leq x$$

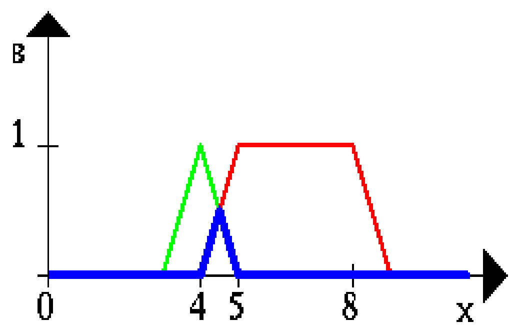
By plotting equation 1.4 we get a triangular graph below figure called "triangular membership function"



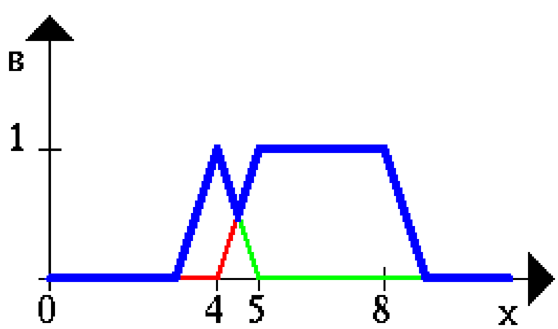
The above Figure : Membership functions with smooth transitions

b) Fuzzy Set of Operations

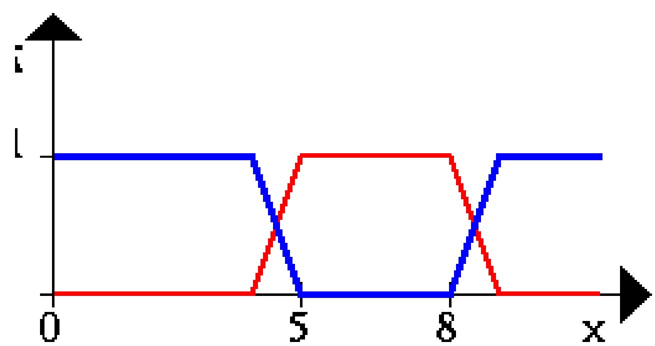
1. Fuzzy intersection
2. Fuzzy union
3. Fuzzy complement



a) Fuzzy intersection



b) Fuzzy union



c) Fuzzy complement

c) Fuzzy Rule Base

A fuzzy rule-based model of human problem solving is described. The model is presented in its general form and then adapted to fit data from a simulated fault diagnosis task. The model was able to match 50% of human subjects' actions exactly while using the same rules approximately 70% of the time. Problem solving rules were selected by the model according to measures of recall, usefulness, applicability, and simplicity. Rules were further discriminated by their use of symptomatic information for pattern recognition or topographic information for information seeking.

A production rule consists of two parts: condition (antecedent) part and conclusion (action, consequent) part, i.e:

IF (conditions) THEN (actions)

***Rule 1**: IF (C Score is high) and (C Ratio is good) and (C Credit is good)*

then (Decision is approve)

***Rule 2**: IF (C Score is low) and (C Ratio is bad) or (C Credit is bad)*

then (Decision is disapprove)

d) Fuzzy inference system editor

The FIS editor handles the high level issuing for the system such as the number of input and output variables an their names, types of the 'AND' and 'OR' operators, and the aggregation and defuzzification methods.

i. *The member ship function editor*

The membership function editor is used to define the properties of the membership function for the systems variables.

ii. *The rule editor*

The rule editor enables the user to define and edit the of rules that describe the behavior of the system.

iii. *The rule viewer*

The rule viewer is a read only tool that displays the whole fuzzy inference diagram.

iv. *The surface viewer*

The surface viewer is also a read only tool. it is used to display how an output is dependent on any one or two of the inputs.

III. Development of Fuzzysystem Using Triangular

In this topic researcher work is to develop a fuzzy inference system(FIS) for evaluated the performance of Security Strategy of conventional methodology fuzzy logic theory is used here, because this theory is more appropriate for this type of problem.

Various factors for evaluate the performance will considered. We will consider most relevant some of the factors selected and will be fuzzified as input fuzzy variable "performance will be fuzzified with suitable fuzzy linguistic variable, and ultimately FIS will be developed.

a) Input Parameters

1. Management
2. Technology
3. Budget
4. Training

b) Output Parameters

1. Goal
2. Critical
3. Sub-Critical
4. Alternative

c) Linguistic Variables

1. Equality Important
2. Slightly Important
3. Important
4. Very Important
5. Absoultely Important

INPUT	INPUTNAME	LINGUISTIC	RANGE
INPUT1	MANAGEMENT	EQUALITY IMPORTANT	1-20
		SLIGHTLY IMPORTANT	20-40
		IMPORTANT	40-60
		VERY IMPORTANT	60-80
		ABSOULTELY IMPORTANT	80-100
INPUT2	TECHNOLOGY	EQUALITY IMPORTANT	1-20
		SLIGHTLY IMPORTANT	20-40
		IMPORTANT	40-60
		VERY IMPORTANT	60-80
		ASOULTELY IMPORTANT	80-100
INPUT3	BUDGET	EQUALITY IMPORANT	1-20
		SLIGHTLY IMPORTANT	20-40
		IMPORTANT	40-60
		VERY IMPORTANT	60-80
		ABOULTELY IMPORTANT	80-100
INPUT4	TRAINING	EQUALITY IMPORANT	1-20
		SLIGHTLY IMPORTANT	20-40
		IMPORTANT	40-60
		VERY IMPORTANT	60-80
		ABOULTELY IMPORTANT	80-100

Table 1 : Input Parameters and Their Ranges

OUTPUT	OUTPUTNAME	LINGUISTIC	RANGE
OUTPUT1	PERFORMANCE SECURITY STRATEGY	GOAL	1-30
		CRITICAL	30-60
		SUB-CRITICAL	60-80
		ALTERNATIVE	80-100

Table 2 : Output Parameters and Their Ranges

IV. Fuzzirification

Fuzzification comprises the process of transforming crisp value into grade of membership for linguistic terms of fuzzy sets. The membership function is used to associate a grade to each linguistic term.

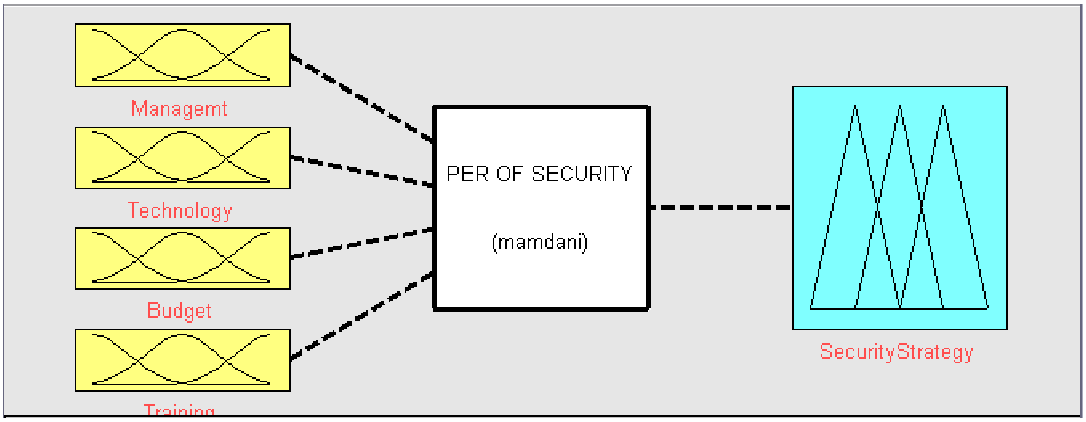


Figure 1 : Developed With Four Input and One Output of FIS Triangular

Figure-1 Describes the we select the five parameters and one output of the e-governance security strategy and apply to the FIS and arrange the rules then we evaluate the e-governance security strategy.

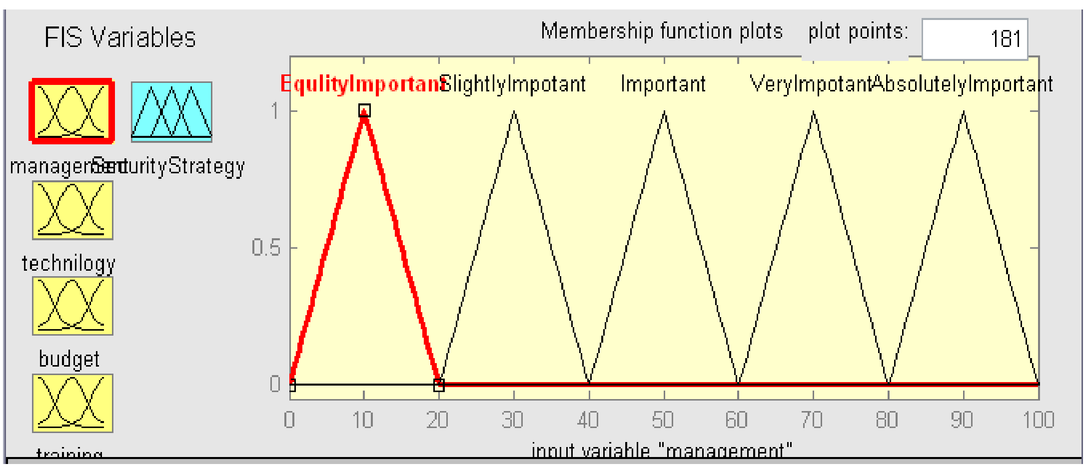


Figure 2 : Fuzzification of Management Triangular

Figure-2 Shows fuzzification of input parameters management with there membership function and its corresponding range as explain in table1, the membership functions touching to each other.

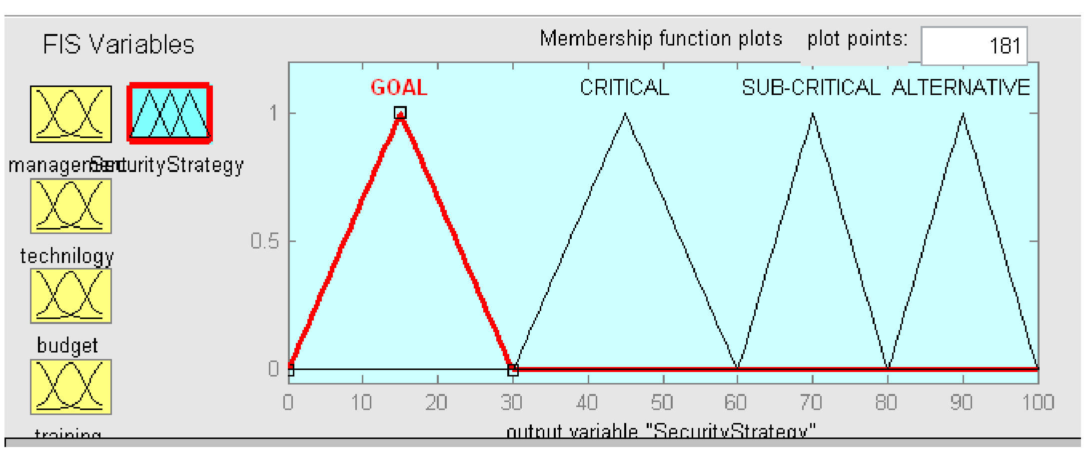


Figure 3 : Fuzzification of Security Strategy Triangular

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Figure-3 shows fuzzification of output parameter performance of security strategy with there membership function and its corresponding range as explain in table 2, the membership function are touching with each other for achieving better results.

V. Rule Based

As per the input and output parameters fuzzified as shows rule base is generated by applying my own reasoning as an expert person to observe or taking decision to Evaluate the performance security strategy of a There are 34 numbers of rules generated using 'AND' and 'OR' operator. The overall rules are written below.

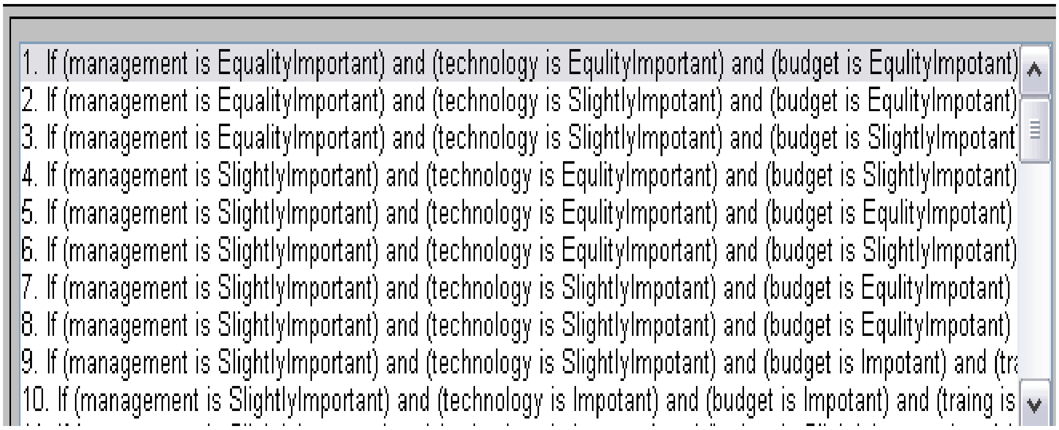

Figure 4 : Developing the Rules

In the below explain some of the Rules

1, If (management is Equality Important) and (Technology is Slightly Important) then (Security Strategy is Alternative)

5, If (management is important) and (Technology is Slightly Important) and (Budget is Slightly Important then (Security Strategy is critical)

12, If (management is very important) and (Technology is Important) and (Budget is Slightly Important) and (Training is important) then (Security Strategy is sub-critical)

28, If (management is very important) and (Technology is Absolutely Important) and (Budget is Important) and (Training is Very Important) then (Security Strategy is goal)

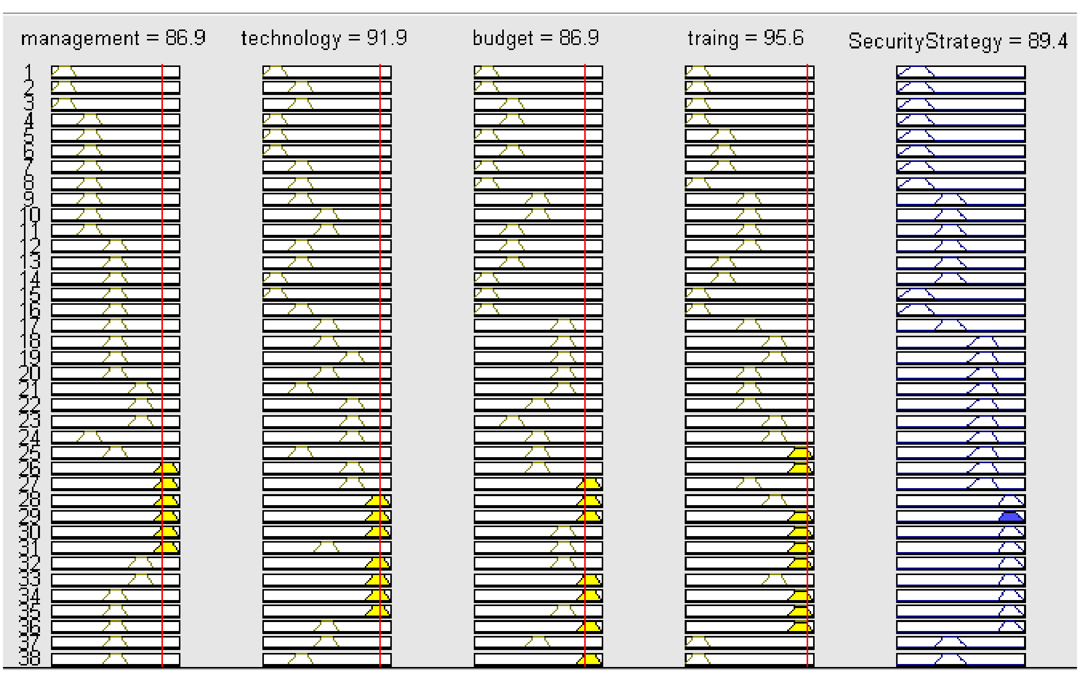

Figure 5 : Shows the Inference Engine Different Evalution Values

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In the below explain some of the different evaluations

1, Management = 15.6, Technology = 29.4, Budget = 38.1, training = 30.6 then performance of Security Strategy = 50.

2, Management = 64.1, Technology = 68.1, Budget = 70.6, training = 69.4 then performance of Security Strategy = 70.

3, Management = 71.9, Technology = 84.4, Budget = 88.1, training = 85.6 then performance of Security Strategy = 90.

Srl. No.	MANAGEMENT	TECHNOLOGY	BUDGET	TRANING	TRIANGULAR
1	9.78	12.5	18	17.3	20.6
2	15.8	16.9	17.3	19.8	38.7
3	32.1	29.4	38.1	30.6	50
4	64.1	68.1	70.6	69.4	70
5	71.9	84.4	88.1	85.6	90.6

Table 2 : Given the different values and their performance of the Security Strategy of the triangular membership function

In the above table shows that how inference engine works for different input values. if we observe this table minimally then one can say that for different values if a input parameters the output security strategy is produced by FIS more or less current.

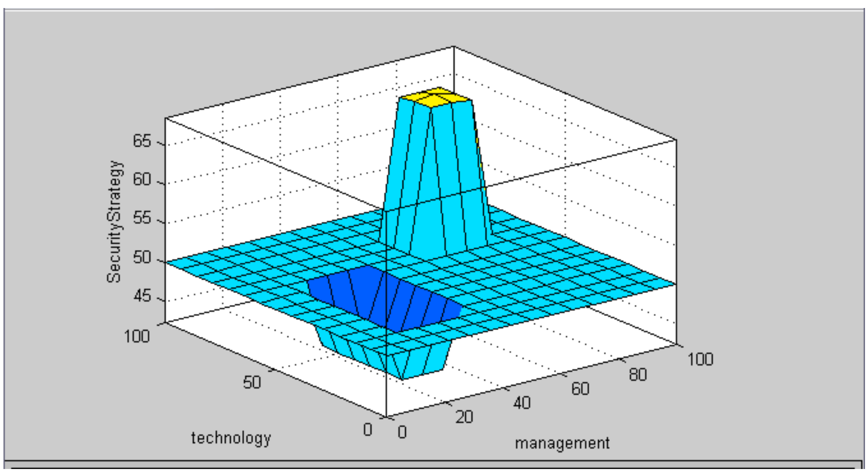

Figure 6 : Three dimensional view of FIS INPUT/OUTPUT Security Strategy

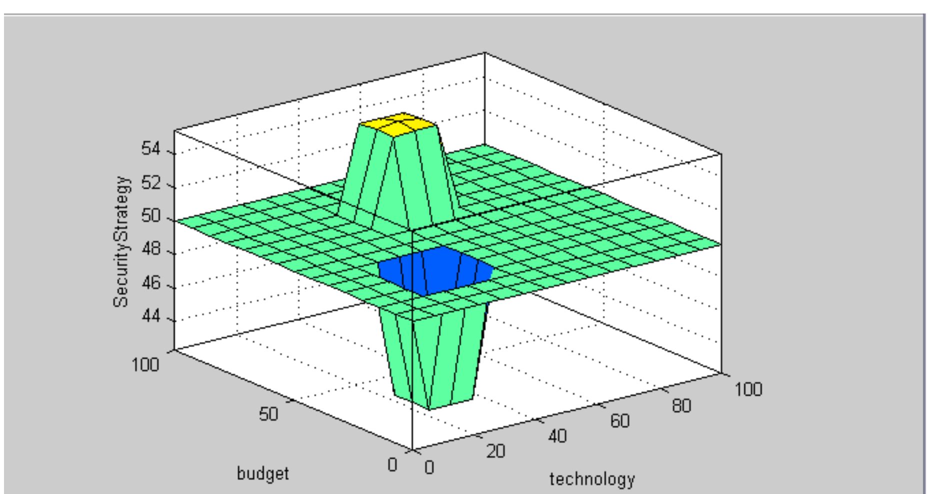

Figure 7 : Three Dimensional View of Fis Input/Output Security Strategy

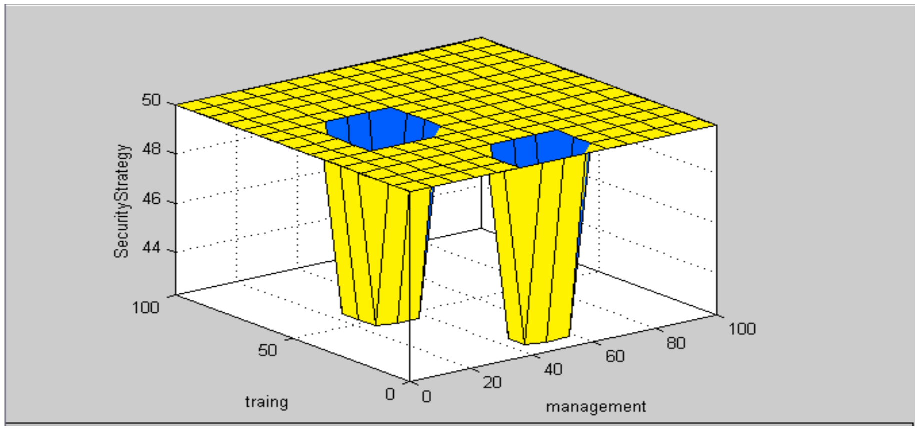

Figure 8 : Three Dimensional View of Fis Input/Output Security Strategy

Three dimensional of surface viewer of rule base explains the Rules is on X-axis is training and Y-axis is Management and we get the Z-axis is security strategy.

VI. Development of Fuzzysystem Using Trapezoidal

a) Trapezoidal Fuzzifiers

For the simplicity of discussion only the trapezoidal fuzzifiers are presented here Fuzzification of a real-valued variable is done with intuition, experience and analysis of the set of rules and conditions associated with the input data variables. There is no fixed set of procedures for the fuzzification.

b) Input

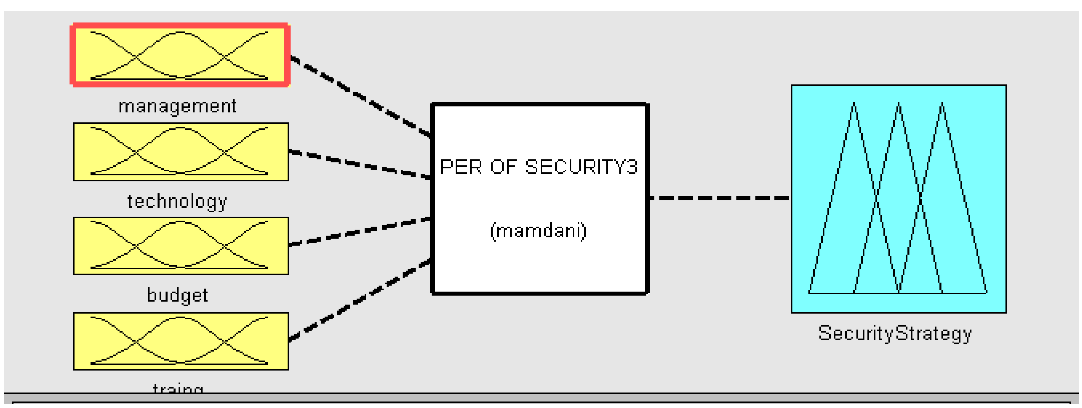

Figure 9 : Developed With Four Input and One Output of Fis Trapezoidal

c) Output

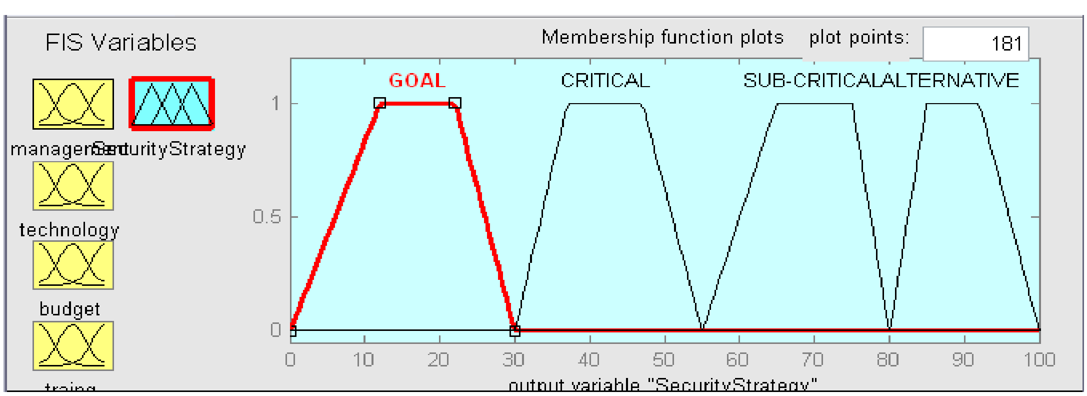

Figure 10 : Fuzzification of Output Security Strategy Trapezoidal

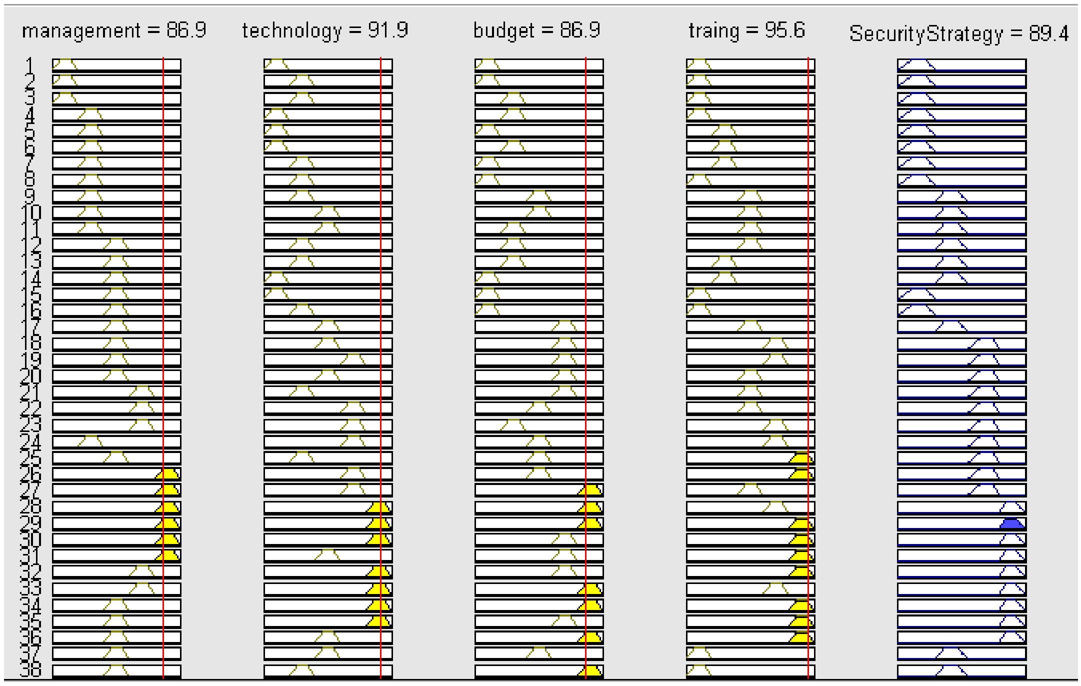

Figure 11 : Shows the Inference Engine Different Evalution Values In Trapezoidal

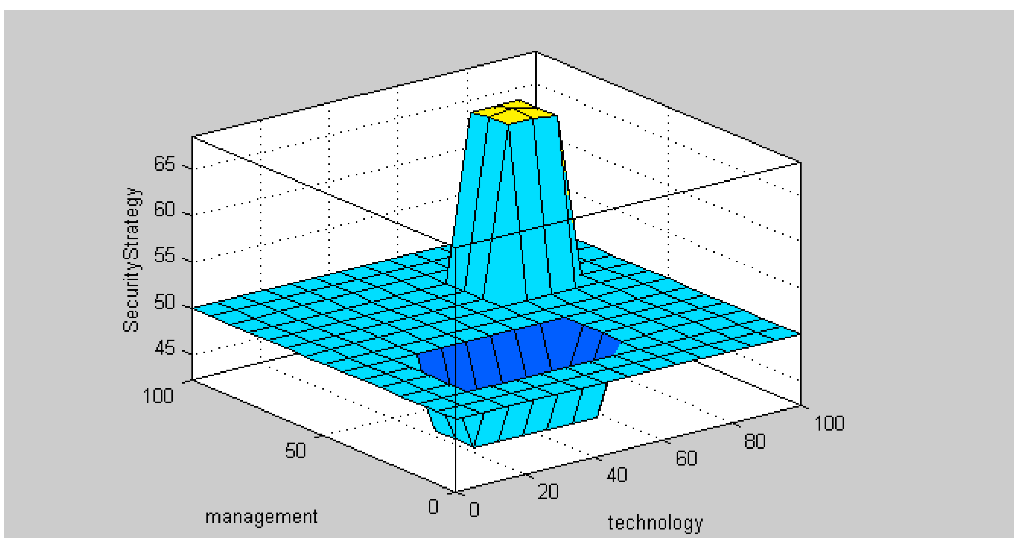

Figure 12 : Three dimensional view of FIS INPUT/OUTPUT Security Strategy

The following table shows that how inference engine works for different input values .if we observe this table minimally then one can say that for different values of a input parameters the output (performance) that is produced by FIS more or less current.

VII. Comparision Table

Comparative table performance of Security Strategy with different inputs for triangular and trapezoidal membership functions shows by the values of evolutions.

	INPUT				OUTPUT	
Srl. No.	MANAGEMENT	TECHNOLOGY	BUDGET	TRANING	TRAPEZOIDAL	TRIANGULAR
1	11.7	12.5	19	18.3	21.6	20.6
2	18.8	16.9	20.3	21.8	39.7	38.7
3	32.1	29.4	38.1	35.6	50.3	50
4	64.1	68.1	70.6	64.4	70.5	70
5	82.9	84.4	87.1	85.6	90.6	90.6

Table 3 : Comparosion of Triangular and Trapezoidal Membership Function

In the above table an example is demonstrated by and my point of view is taking arranging input values for getting the output as security performance in shape triangular and trapezoidal member ship we get the result same.

VIII. Conculsion

In this research paper we tried to developed the security strategy for E- Governance of the government by using fuzzy logic expert system because each and every government department need the absolutely flaw less performance of the security strategies, and using fuzzy technology evaluation of security strategies on the basis of various key performance attributes that have been validated. For obtaining the desired level of performance, we take input value for various attributes applied different membership functions and applied to the same linguistic variables, triangular and trapezoidal, more of less similar and compared the performance and we got the performance of absolute security parameters. The fuzzy scale has been designed to map and control the input data values from absolute truth to absolute false. The qualitative variables are mapped in to numeric results by implementing the fuzzy export system model through various input examples and provide a basis to evaluate government system security strategy.

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17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. **Pick a good study spot:** To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. **Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page

- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.
- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.

- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Administration Rules Listed Before Submitting Your Research Paper to Global Journals Inc. (US)

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

Segment Draft and Final Research Paper: You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.

Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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