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COTS Evaluation & Selection Process in Design of Component based Software System: an Overview and Future Direction

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Abstract- This article presents an extensive literature review of the empirical studies carried out in past for evaluation and selection of components during the design phase of Component Based Software Systems (CBSS). In CBSS approach the software systems can be developed by selecting appropriate components which then are assembled to form a complete software system. These Components can be either of the two (a) COTS (Commercial-off-the-Shelf) components or (b) In-house built components. These components are selected based on different parameters of cost, reliability, delivery time etc. Therefore, optimal selection of the components plays a vital role in development of CBSS as it saves time and effort. Related articles appearing in the International Journals from 1992 to 2014 are gathered and are critically analyzed. Based on the review it is seen that some of the important issues have not been explored fully. Hence there is scope of improvement which paves the path for future work.

Keywords: component based software system, COTS evaluation, COTS selection, pre-packaged solutions.

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COTS Evaluation & Selection Process in Design of Component based Software System: an Overview and Future Direction

Vikram Bali [α] & Sushila Madan [σ]

Abstract- This article presents an extensive literature review of the empirical studies carried out in past for evaluation and selection of components during the design phase of Component Based Software Systems (CBSS). In CBSS approach the software systems can be developed by selecting appropriate components which then are assembled to form a complete software system. These Components can be either of the two (a) COTS (Commercial-off-the-Shelf) components or (b) In-house built components. These components are selected based on different parameters of cost, reliability, delivery time etc. Therefore, optimal selection of the components plays a vital role in development of CBSS as it saves time and effort. Related articles appearing in the International Journals from 1992 to 2014 are gathered and are critically analyzed. Based on the review it is seen that some of the important issues have not been explored fully. Hence there is scope of improvement which paves the path for future work.

Keywords: component based software system, COTS evaluation, COTS selection, pre-packaged solutions.

I. Introduction

Rapid advancements in the area of Information Technology (IT) have enabled the software development organizations to break traditional blocks of building software and explore new methods. The software development approach has significantly changed in the past few years. Modern software systems are becoming increasingly complex and large resulting in high development cost and maintenance. This forced researchers in software engineering field to think about the necessity of designing new methodologies and paradigms to take head on these challenges. Thus the most important component technology was introduced, which advocates development of software applications by creating components and assembling them.

Many outstanding work have been published in the area of COTS evaluation and selection for the development of software using component based technology. This review paper is dedicated to the COTS evaluation and selection frameworks devised by different authors in the past. Best Practices of COTS selection in literature and in industry is an important review work carried out by Land *et al* [32].The present article looks into the research papers with a view to understand the framework given by different authors for COTS evaluation and selection. An attempt is made to explain few latest frameworks in a nutshell. The review work has been classified into two parts, namely: (a) COTS evaluation (b) COTS selection. The first part is dedicated to the COTS evaluation process. The second part of this paper discusses and reviews some of the optimization models of COTS selection proposed in the literature. Papers are discussed in the chronological order, enabling the readers to get an overview of the past models to the latest trends. For instant glimpses, the references are listed and summarized into a tabular form in each of the part. It is strongly believed that this work will give a quick insight for the future work concerned with COTS evaluation and selection. The following section of the article briefly describes software development using CBSS approach.

The rest of the paper is organized as follows. In Section 2, we discuss the software development using Component based software approach. Section 3 is divided into two sub sections, 3.1 gives the brief overview of the COTS evaluation approaches and sub-section 3.2 presents the COTS selection approaches proposed in the literature. Each sub section contains a table that list all the papers in chronological order. Finally in Section 4, we furnish our concluding remarks.

II. Component Based Software System

Development of Component based software system advocates building software by selecting reliable, reusable and robust software components and assembling them within appropriate software architectures. This idea can be used to improve the productivity and quality of the software products. These components are usually pre-packaged solutions, known as Commercial-off-the-Shelf (COTS) software products. COTS are pieces of software that can be reused by software projects to build new systems [19,47]. These software products are developed and supported by outside suppliers, also called software vendors in the software market. Generally, COTS software products have the ability to reduce time and cost of software development [48]. Moreover, they enable software

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buyers to acquire software made up of components, which have been tested many times by other users, hence ensuring improved software quality [3]. For systems that depend on COTS products, the evaluation and selection of appropriate products is essential to the success of the entire system. Yet many organizations struggle during the evaluation and selection process. The selection of COTS components is a major challenge to software developers due to multiplicity of similar COTS products available in the market with varying characteristics and quality differences. Moreover, COTS selection is a complex decision-making problem that is characterized by uncertainty, complexity, multiple stakeholders, multiple objectives [48]. Many outstanding works have been published in the area of COTS evaluation and selection.

In the year 2008, Cortellessa *et al,* introduced an optimization framework for build-or-buy decision for building a component based software system. In his work, he extended the idea of software development by not only assembling COTS components but also in-house built components. A common issue in building software architecture is whether to build software components in house or buy them. *Build* means developing sub-systems from the scratch. After this we integrate these sub-systems to form complete software. Buy means purchasing the sub-systems from the market. The subsystems which are purchased are known as commercial-off-the shelf (COTS) components and this decision is called build vs. buy decision. The decision of whether to build or buy the system does not only depend on the relative price of the alternatives. The complexity is an important criterion to be considered. We should buy COTS components when there is a demand for short delivery time and a small quantity of the product is desired. Build decision is preferable when technology is easily available and cheaper, also sometimes there are existing components that can be reused by modifying them to adjust to the present requirements.

III. Analysis of Cots Evaluation and Selection Approaches

The review work has been classified into two parts, namely: (a) COTS evaluation: (b) COTS selection. The first part is dedicated to the COTS evaluation process. The second part of this paper discusses and reviews some of the optimization models of COTS selection proposed in the literature.

a) *COTS Evaluation Approaches*

There are three strategies given in the literature which can be applied to evaluate the COTS products: (a) Progressive Filtering Strategy (b) Keystone Strategy (c) Puzzle Assembly Strategy

Progressive Filtering Strategy begins with large number of COTS software candidates in the list, and then each potential COTS software candidate is met with by a set of discriminating criteria which are defined through successive iteration of COTS software estimation cycle [29,32]. COTS software that does not satisfy these evaluation criteria is progressively removed from the COTS software candidates' list in each cycle of estimating. This strategy is done iteratively until the fitness of COTS software candidates are identified and retained in the list. Selecting one or more of COTS software can then be done from the list for integrating in the application [2].

In *Keystone Strategy*, the COTS software candidates are estimated against a key characteristic [29]. So the key characteristics (e.g. vendor location, type of technology) are identified at the beginning of this strategy, then the searching for COTS software will be based on satisfying this keystone characteristic. This strategy is applied at the beginning stages of the evaluation in order to permit quick removal of the large number of COTS candidates that do not satisfy the keystone characteristic [32].

The idea of *Puzzle Assembly Strategy* is taken from collecting pieces of a puzzle [39]. This strategy assumes that when selecting the COTS software we must consider the fitting of the COTS software with other components on the system [29,2]. In other words, COTS software that can be considered as fitness in isolation might be not acceptable when assembled with other components in the system. Therefore, in this strategy, choosing COTS software must be done by considering the other components requirements in the puzzle.

Mohmad *et al* in [39] argues that more than one strategy from the above can be used with the same project. For example, the keystone can be used at the beginning of the project to eliminate the largest possible number of COTS candidates, and then the progressive filtering can be used later on.

Oberndorf also proposed that more than one of the strategies above can be employed in the same project [47]. For example, a developer might use keystone identification first and then progressive filtering later.

Multiple criteria have to be considered during the selection of components for software development. A balance between technical characteristics, financial issues and application requirements is required. Many authors have proposed different methods of selection of COTS components for development of CBSS. One of the first proposals was given by Kontio *et al* in [26] they proposed the OTSO (Off-The-Shelf Option) approach for COTS selection. The authors developed a method that addresses the selection process of packaged, reusable off-the-shelf software. The OTSO approach supports the search, evaluation and selection of software components.

In 1996, Kontio published several follow-up papers to elaborate OTSO [27]. An approach called

PRISM (Portable, Reusable, Integrated, Software Modules) was proposed by Lichota *et al,* [34]. In their approach a generic component architecture was proposed that can be used during COTS evaluation process. However, it was not until 1998 that another important milestone was reached with the Procurement-Oriented Requirements Engineering approach (PORE) [37]. The importance of PORE is that it proposed a requirements engineering process for COTS-based development. PORE suggested that requirements should be elicited and analyzed at the same time when the COTS products are evaluated.

The STACE (Social-Technical Approach to COTS Evaluation) approach [32] emphasized the importance of non-technical issues, e.g., social, human, and organizational characteristics, during the evaluation process. Ochs *et al* [42] proposed the COTS acquisition process (CAP) which highlighted the concept of a "tailorable evaluation process". The approach suggested that the evaluation process should be tailored based on the available effort for the project and it relied on experts' knowledge to tailor the process.

In 2001, a project was initiated by Chung *et al,* [11,12,13,14] to describe a COTS – Aware Requirements Engineering (CARE) Process. CARE uses a flexible set of requirements based on different agents' knowledge. For the same, CARE proposes a method to define relevant agents as well as the system goals and requirements. The PECA (Plan, Establish, Collect and Analyze) approach was proposed by Dorda *et al* [17] from Software Engineering Institute (SEI) describes a detailed tailorable COTS selection process and gives guidelines which the experts can use to tailor the process. In 2002 [35] proposed the Balanced Reused Model (BAREMO) approach. This approach explains in detail how a decision can be made based on Analytical Hierarchy Process (AHP) [43]. The Combined Selection (CS) approach [9] is used to select multiple COTS products that all together satisfy the requirements. This approach performs its activities at two levels: local and global. The global level addresses the overall process of the combined selection, fires individual selection processes for each area and tries to find the best overall combination of products. The local level use existing COTS evaluation and selection techniques e.g. OTSO [26] or PORE [37] to select individual COTS that are combined at the global level.

The approach by Erol and Ferrell, [18] is an evaluation approach that supports selecting a COTS product from a finite set of products based on more than one objective and a set of quantitative (e.g cost) and qualitative (e.g. linguistic variables) data. The approach uses fuzzy QFD (Quality Function Deployment) [1] to collect and quantify the qualitative data. Then goal programming is used to get near optimal solutions to the decision maker.

DesCOTS (Description, Evaluation and Selection of COTS components) approach was presented by Grau *et al*, [20]. DesCOTS system includes a set of tools that can be used to evaluate the COTS products based on quality models.

Shyur in [45] in his work models the COTS evaluation problem as Multi-criteria Decision Making (MCDM) problem. He proposes a five phase COTS selection model, combining the technique of ANP (Analytic Network Process) and modified TOPOSIS (technique for order performance by similarity to idea solution). ANP is used to determine the weights of multiple evaluation criteria. The modified TOPOSIS is used to rank competing products in terms of their overall performance.

In 2007, the MiHOS (Mismatch-Handling aware COTS selection) approach was developed [39]. The approach focuses on handling the mismatches between COTS candidates and the requirements. MiHOS uses techniques such as linear programming to identify near optimal solutions. In 2007, an interactive decision support approach for multi-objective COTS selection was addressed by [40]. Authors have introduced a two-phase decision support approach for selection of COTS products.

Couts *et al* [16] have shown that the evaluation and selection of COTS software is performed using ad-hoc manners.

Tarawneh *et al* [46] proposed a framework to support and improve the COTS software evaluation and selection processes in industry. To achieve this objective the authors have shown that specific objectives have to be addressed:

1. Identify the processes which support COTS software evaluation and selection.
2. Determine the criteria or requirements which are important for successful evaluation and selection process.
3. Propose methods and techniques to address the mismatch between COTS features and customer requirements.
4. Develop a repository to manage information from previous selection cases that support the decision making process.

Mead N. R. in [38] developed Software Quality Requirements Engineering for Acquisition (A-SQUARE) methodology for eliciting and prioritizing security requirements as part of the acquisition process. The author in her report, evaluated the effectiveness of the A_SQUARE method by applying it to a COTS product for the advanced metering infrastructure of a smart grid.

Table 1 : References on the Topic of COTS Evaluation

S. No.	Ref. No.	Year	Authors	Approach
1.	26.	1995	Kontio *et al*	OTSO
2.	34.	1997	Lichota *et al*	PRISM
3.	37.	1998	Maiden and Ncube	PORE
4.	30.	1999	Kunda and Brooks	STACE
5.	42.	2000	Ochs *et al*	CAP
6.	12.	2001	Chung *et al*	CARE
7.	33.	2001	Lawlis *et al*	RCPEP
8.	17.	2002	Dorda *et al*	PECA
9.	35.	2002	Lozano and Gomez	BAREMO
10.	9.	2002	Burgues *et al*	CS
11.	20.	2004	Grau *et al*	DesCOTS
12.	8.	2005	Bhuta *et al*	CCCS
13.	10.	2005	Cechich and Piattini	CPF
14.	45.	2006	Shyur	Five phase model
15.	39.	2007	Mohamed *et al*	MiHOS
16.	44.	2008	Sheng and Wang	Gap Analysis
17.	36.	2010	Mahmood	Experimental Evaluation
18.	16.	2010	Couts *et al*	Ad-hoc manner
19.	46.	2011	Tarawneh *et al*	The State of the Art
20.	38.	2014	Mead N. R.	A-SQUARE

b) Optimal COTS Selection Approaches

Several optimization models have been proposed in the literature for the optimal selection of the software components for the development of safe and reliable software systems. The models use basic information on components reliability and cost and allow the trade-off between two factors. Ashrafi and Berman, [4] presented two models which address the tradeoff between reliability and cost. The model is applied to large software packages that consist of several programs. The models can be used as decision support tools for organizations that are in the process of purchasing of variety of computer programs in order to meet the needs of the users, e.g. operations people need software packages to perform functions such as scheduling, inventory control and purchase orders. While the main consideration is to attain high average reliability for the software package, management has to consider both the relative importance of each program in terms of the frequency of the usage of their corresponding function. Programs can be purchased from software development companies. Several programs are usually available for each function. Each program has a known market cost and an estimated reliability. It can be noted here that the assumption of using the ready programs available in the market to make the software package implies the use of COTS (Commercial-off-the-shelf) program. Hence the models are applicable to only those software packages that are designed using COTS products. The authors have formulated two types of models one which does not consider redundancy for performing each function and the other which maintains redundancy under budget limits.

Considering the concept of COTS in a software development and the availability of mathematical models to access module reliability, it is possible to have information on module reliability and cost. In their previous work [5] authors used optimization models to determine the redundancy level of a software package consisting of several independent functions where each function is performed by a program with known reliability and cost. In this work, however, they broke down this approach one step further and deals with software systems consisting of one or more programs where each program consists of series of modules, which upon sequential execution will perform a function. Four models are presented, each applicable to a different software system structure.

The optimization models discussed in the previous sections don't consider any of the fault tolerance schemes such as recovery block or NVP. They merely consider the programs consisting of set of modules, which on sequential execution perform the

function. Berman and Kumar, [7] studied the problem of optimum selection of component for the recovery blocks for the first time. The author presented optimization models for a fault tolerant software system. Specifically they have formulated optimization problems for two types of recovery blocks namely — Independent and Consensus recovery block schemes.

The optimal component selection problem addressed by Kapur *et al,* [25] considers software built by assembling COTS component performing multiple functions. Each function is performed by calling a set of modules. Modules can be assembled in a recovery block scheme to provide the fault tolerance. Again for each alternative version multiple choices are available from the supplier with distinct reliability and cost. The version for any alternative choice having higher reliability has higher cost. Two models are formulated for weighted maximization of system reliability, weights being decided with respect to access frequency of functions within the available budget. Each module is comprised with a set of COTS alternative that are available in the market.

Cortellessa *et al,* [15] introduce a framework that helps developers to decide whether buying or building components for certain software architecture. Once built software architecture, each component can be either bought, or probably adapted to the new software system, or it can be developed in-house. This is a "build-or-buy" decision that affects the software cost as well as the ability of the system to meet its requirements.

Gupta *et al*, [22] in their work have formulated fuzzy multi-objective optimization model for selection of COTS components for development of a modular software system. The hierarchy structure of the software consists of three programs, four modules and eleven COTS products. Some specific functions of each program can call upon a series of modules, and several alternative COTS products are available for each module. Different weights are assigned to different modules using an AHP technique. The issue of compatibility amongst the COTS products is also discussed.

Kwong *et al,* [31] have addressed an optimization concept of selection of software components using intra-modular coupling density (ICD) and functional objective along with few system constraints of ICD and functionality without redundancy for a CBSS development.

Jha *et al,* [24] formulated multi-criteria problem for minimizing the overall cost and maximizing the system reliability by using fuzzy multi objective optimization model for selecting the best COTS software product among alternatives of each module for modular software system.

Jha *et al,* [23] formulated a multi-objective problem with cost minimization and reliability maximization as the two objectives with an upper bound on cost and lower bound on reliability. This model was formulated for Recovery Block and Consensus Recovery Block fault tolerant software. Author used goal programming approach for solving the problem.

Kumar *et al,* [28] discussed an effective approach to formulate multi-objective problem with cost minimization and reliability maximization as the two objectives with an upper bound on cost and lower bound on reliability. The author used goal programming approach for solving the problem based on Consensus Recovery Block Scheme.

Bali *et al*, [6] proposed optimization models for optimal component selection for a fault-tolerant modular software system under the consensus recovery block scheme. It is necessary to identify critical modules in the design of a fault-tolerant modular software system and also to develop a system with a built in redundancy for critical modules. During the planning phase of software development, it is necessary that modules are categorized and identified based on their reusability and criticality to run the application. In order to achieve this, a constraint on criticality of modules can be used to achieve the effective redundancy for all critical modules and at least one effective alternative for non-critical modules.

Table 2 : References on the Topic of COTS Selection

	Ref. No.	Year	Authors	Objective Function	Approach
1.	4.	1992	Ashrafi & Berman	Reliability	Integer Programming Problem
2.	5.	1993	Ashrafi & Berman	Reliability	Integer Programming Problem
3.	7.	1999	Berman & Kumar	Reliability	Integer Programming Problem
4.	25.	2003	Kapur *et al*	Reliability	Integer Programming Problem
5.	15.	2008	Cortellessa *et al*	Cost	Integer Programming Problem
6.	22.	2009	Gupta *et al*	Quality, Cost	Fuzzy Multi Objective Optimization Model
7.	31.	2010	Kwong *et al*	Intra-modular coupling density	ICD and Functionality without Redundancy
8.	24.	2010	Jha *et al*	Reliability, Cost	Multi Objective Optimization Model
9.	23.	2011	Jha *et al*	Reliability, Cost	Fuzzy Multi Objective Optimization Model
10.	28.	2012	Kumar *et al*	Reliability, Cost	Goal Programming
11.	21.	2012	Gupta *et al*	Cost, Development Efforts, Execution Time, Reliability and Quality	Fuzzy Interactive Approach
12.	6.	2014	Bali *et al*	Reliability, Cost	Fuzzy Multi Objective Optimization Model

IV. Observations and Concluding Remarks

An attempt has been made in this paper to review and critically analyze the COTS evaluation and selection process. Reviewed papers are categorized into two themes: evaluation and selection. We have tried to explore the COTS evaluation and selection practices and compare the most significant approaches. The objective of this study is to identify currently used decision making practices of COTS evaluation and selection. In future the authors would like to propose a framework for COTS selection which is relevant to today's era of software development approach. Moreover, the models proposed in the literature have not talked about build-or-buy strategy in depth and issue of criticality in specific.

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Agent based Software Testing for Multi Agent Systems

By Manjeet Kumar & Dr. Rabins Porwal

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Abstract- Software testing starts with verification and validation and fulfills the requirement of the customer. Testing can be done by automation tool like Win runner, QTP or manually. If we talk about manual testing it takes lot of time and manpower also so nowadays we are using automation software. When we talk about automation testing so the cost of such kind of testing is very high so each company cannot afford. In this paper we are presenting agent based testing which is helpful for both kind of testing. Multi-Agent Systems (MAS) are characterized by autonomous and collaborative behaviors [1, 2]. Developing such systems is a complex process. As a result, a methodology for developing MAS is highly necessary. In this paper, a methodology using roles and ontology for such a purpose is presented [2]. The functionality of roles is estimated in the various phases of the MAS development. It is based on an emphasis on the properties and behaviors associated with each agent in MAS.

Keywords: *software agent, muti agent system (mas), roles, ontology, bug, regression testing.*

GJCST-C Classification : *G.4 K.7.3*

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Agent based Software Testing for Multi Agent Systems

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Keywords: software agent, muti agent system (mas), roles, ontology, bug, regression testing.

I. Introduction

Software testing is an exercise to simulate a system. Testing provides the program to get the desired goal. Testing analyze a program with the intent of finding problems and errors that measures system reliability. Testing cannot show the absence of bugs. It proceed the evaluation to SRS and is indication of software correctness. Testing consists of identification of required requirement and design as well as execution test of code. Along with the progress of computer network and communication, the research on MAS has become one of the hotspots in distributed AI [5,6]. Agents have been steadily moving into more and more significant applications [3]. Agents are capable to support more naturally the development of software systems whose components are heterogeneous and autonomous. These properties make agents ideally suited to applications in electronic commerce, virtual enterprises, and other open settings [2]. In these applications, agents must work in cooperation with traditional systems. Because of the importance of these applications and the risks of developing invalid systems, techniques for building agents must compare well with the techniques for building traditional application. There is, thus, a major need for industrial-strength approaches for engineering agent-based systems and to develop an approach. Mean while, the concept of role and role model [2]. This paper presents the significance of roles in MAS and proposes a method to realize its potential. The method supports dynamic binding between role and agent.

Agent technology is very useful in Internet computing. It is suitable for service oriented computing and interact with each other . The OO methodology is insufficient for developing agent-based systems because it cannot naturally represent the essential characteristics of agents, such as autonomous behavior, designated environment. For example, a web services application would be able to search for service providers from a web services registry and then dynamically establish a cooperation relationship with the service provider and request services and emergent behaviors resulting from the above characteristics commonly occur in MAS. These properties are not properly addressed in OO methodologies. Agent as a key concept is necessary for systematic, effective and efficient development of MAS.

Software agents represent an interesting paradigm to develop intelligent and distributed systems, because of their autonomy, proactiveness and reactivity; in addition, their sociality enables the distribution of the application logic in different agents that can interact together and with the host environment. In such a scenario interactions must be carefully designed and managed at run-time[5]. The concept of role has been adopted in different kind of agent approaches to flexibly manage interactions. In particular, the approach presented here can support and help the agent deciding the role.

The existing works on agent-oriented software engineering can be classified into two main camps: technique based methods and generalizing related methods. A technique specific method is based on a specific agent language or agent theory and/or aims at developing MAS to be executed on a specific agent platform or environment. Technique specific methods have a number of advantages [6,7]. They are practically usable, efficient and effective for certain types of software. These methods include guidance to development process and supporting languages without refer to any specific agent theory and implementations techniques.

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II. Software Agents vs. Roles

If we talk about software industry, software agent can be used as a sunshade term for development. Task oriented robots, user bots, personal agents, autonomous agents and personal assistants are all software agents[3,4]. Those tha vast computer networks are known as soft bots[6]. In two general usages of the term agent are distinguished: one as a weak usage, two as a stronger and potentially more contentious usage. A weak agent is hardware or software based computer system with four key properties autonomy, social ability, reactivity and proactive ness. (i) Autonomous : An autonomous agent can operate without the direct intervention of anything. The internal state and goals should drive the agent to move its autonomous actions towards completion of the users or systems goals. (ii) Social ability: The ability to interact with other agents by way of some agent-communication language.(iii) Reactivity: A reactive agent can perceive its environment and respond in a timely fashion to changes that occur. (iv) Proactiveness: By being proactive, an agent does not simply act in response to platform. In [this attribute is a part of autonomy and is not considered unique. However, in [9,6], these are attributes "which agents should exhibit.

Several MAS methodologies such as MaSE [3,7] have adopted the concept of role (or role model) in analysis and design phases. In Gaia, a role is a quadruple <responsibilities, permissions, activities, protocols>. Role in MAS is defined as: (1) From the conception perspective, a role is a constraint under which an agent takes part in some interactions and evolves in a certain way. In MAS, an agent behaves under its bound roles. (2) From the implementation perspective, a role is an encapsulation of certain attributes and behaviors of the agent it is bound to. The characteristics of agent role relationship are: (i) Multiplicity: An agent can have more than one role at one time; (ii) Dynamicity: An agent can dynamically change its roles; (iii) Action ability (iv)Dependency: Roles are not isolated, they must be other roles related to an agent; (v)Role provides agent-to-agent interface (vi) Software reuse by roles: Roles provide a facility for efficient reuse.

III. Role-Based mas Development (rbmas)

An attractive feature of agent-orientation is that it provides a powerful metaphor for describing, understanding and modeling information systems that contain multiple autonomous active information processing agents and information sources and receivers. A role is intended to enable software engineers to use as a metaphor effectively to develop such cooperative information systems systematically through smooth and ordered transitions from models of the current system and users' requirements to the designs and implementations of new systems in an evolutionary way.

As shown in Fig1, an RBMAS considers such evolutionary development of information system as repeated cycles of modeling the current system and its operation environment, designing a new system to be executed in a new environment. This abstract model is then refined and realized using more concrete concepts to implement the new system. As this new system is subject to further modification as users' requirements change and the organizational environment and technology evolve, then a new cycle of modeling, design, refinement. Therefore, role's process of agent-oriented software development can be divided into three stages: (a) the analysis and modeling of the current system(b) modifications to the system hence the building of a model of the new system, (c) the implementation of the new system.

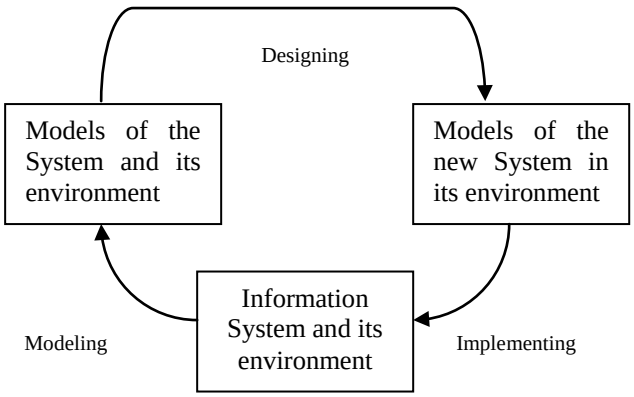

Figure 1: Evolutionary life cycle of MAS

Models of information systems play at least two important roles. The representation of the design of a new system so that properties of the new system can be inferred. The tester will be interested in different properties of the model. In the former case, software engineers will be interested in the following properties: (1) correctness in terms of whether the model accurately represents the real system to certain abstraction level; (2) comprehensibility in terms that complex systems can be represented in an comprehensible way. The following properties of the new system: (i) the correctness of the design in terms of whether users' requirements are met; (ii) the feasibility in terms of whether the design can be implemented and how costly the implementation will be; and, (iii) the sustainability in terms of its ease of maintenance and ease of modification for the evolution of the system in the future. Therefore, it is desirable to know how much modification to the existing systems required by the new design. It is also desirable to know the modifiability and reusability of the designed system in view of possible future development

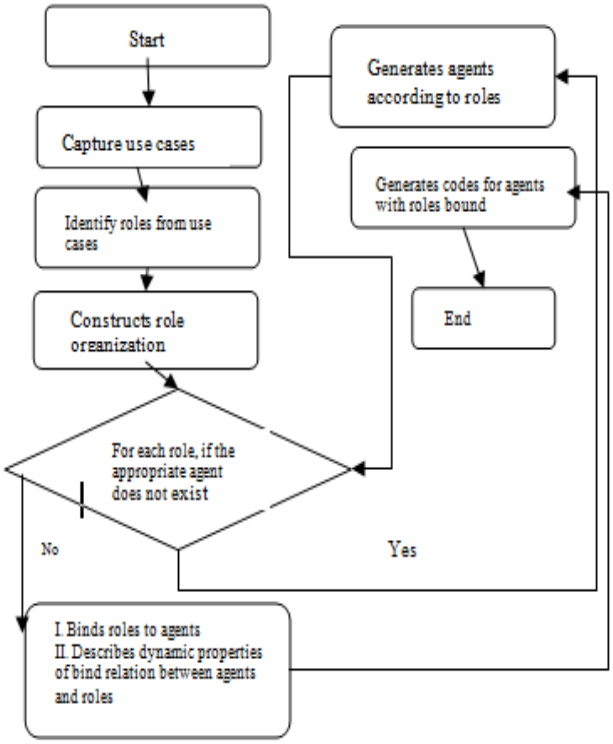

Figure 2 : Flow Chart : Analysis and modeling of roles

We propose a role-based modeling language tailored to (i) explicitly separate role from agent conceptually and linguistically; (ii) roles exist throughout the whole process of MAS development. The Flow chart for main development Process of analysis and modeling of roles is shown in fig 2.

a) Capture Use Cases

In fig 3, use case diagram for knowledge Transfer with an example is explained. Professor actor includes Explain Concept by Black Board use case or Explain Concept by Practical / Projector use case lecture in the class; student actor includes Grasp the Concept use case to understand the lecture. In some possible conditions, Explain Concept by Practical / Projector use case may be extended by Explain Concept by simulation use case. In [UML], detailed information about <<include>> and <<extend>> stereotypes is discussed.

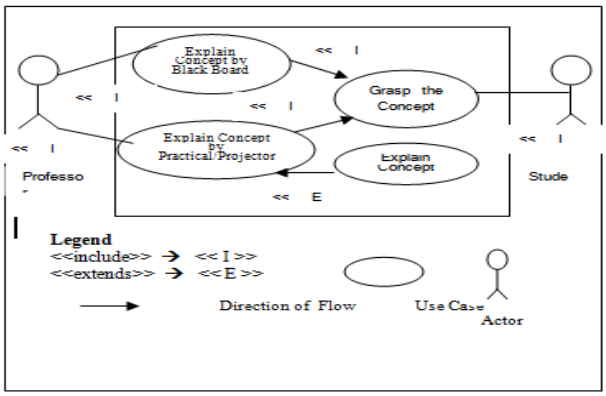

Figure 3 : Use Case Knowledge Transfer

b) Ascertain Roles

Roles can be identified from use cases [9, 8]. However, use cases are not sufficient for describing all the roles and events in the MAS. An assistant method is to check the words with *–er*, *-ist* or *–or* suffix in the requirement specification. Fig 4 shows an example notation of role.

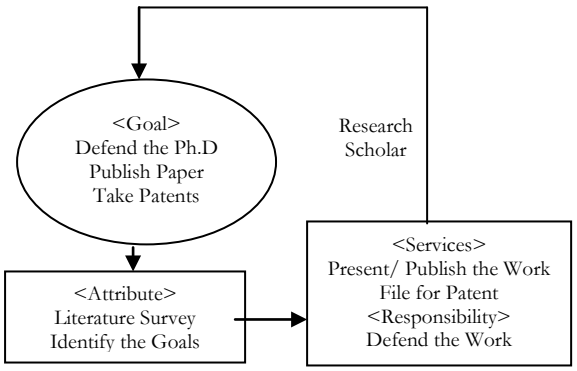

Figure 4 : Role Example of Research Scholar

c) Construct Role Organizations

Every role communicates and interacts with other roles. Besides, roles can be specialized or aggregated to other roles. Inheritance and aggregation associations respectively denote specialize/generalize and aggregate/decompose relations among roles. Fig 4 shows a role coordination chart triangle denotes inheritance relation, diamond denotes aggregation relation, and rectangle with a line on left-top corner denotes organization [3,5,7].

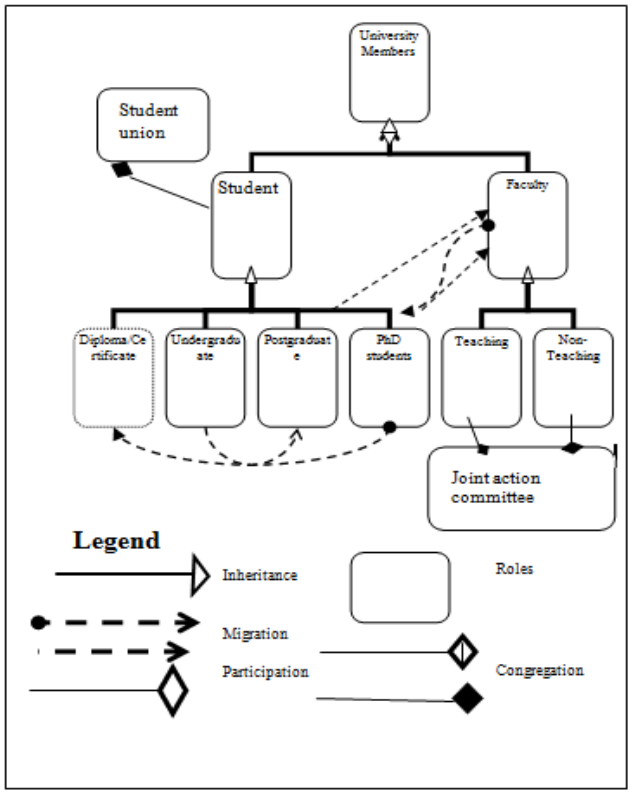

Figure 5 : Roles in a university

d) Bind Roles to Agents

For each role, the appropriate agent may belongs to to agent classes directly (fig 5). An agent has a name, attributes in the below figure Role Organization is given.An agent can change its roles dynamically. To make this property clear, we apply finite automata to describe agent's role transitions (role transition). All the roles are bound to the agent. Role binding describe initial binding of role to agent. The rectangle is a compact form of agent and the rectangle with semi-circle is a compact form of role

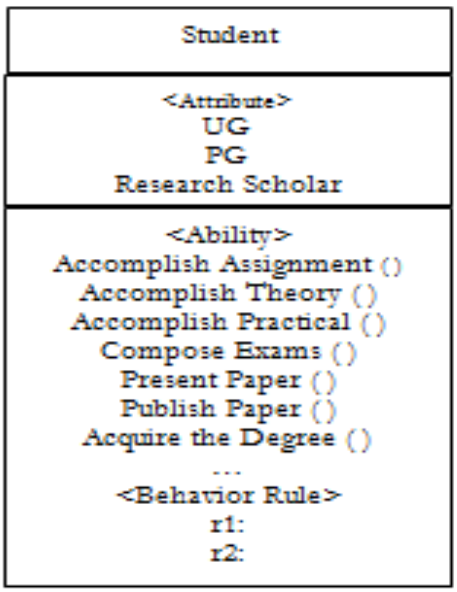

Figure 6 : Student Agent

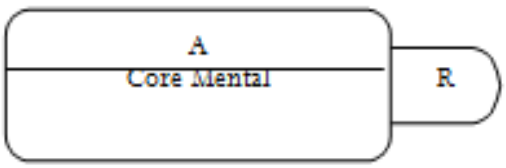

Figure 7 : Role Binding

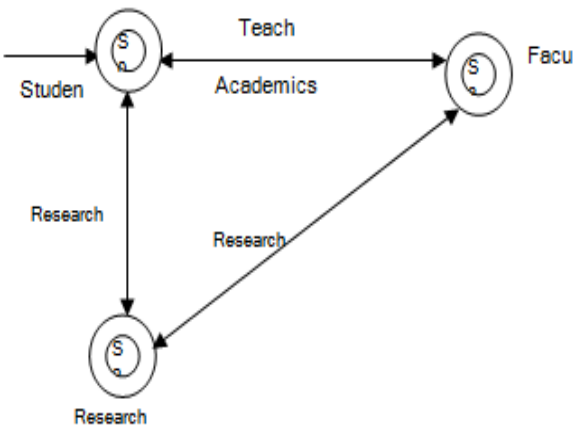

Figure 8 : Role

IV. Ontology Overview

Ontology is description of problem domain, where entities of the domain, its properties and its relations are described. In a sense it is vocabulary, thesaurus or taxonomy. It is a set of definitions of content-specific knowledge representation primitives (classes, relations, functions and constants). It represents the hierarchical structuring of knowledge about things by subcategorizing them according to their essential qualities.

The huge advantage of ontology is not in processing, but in sharing meaning, emergence and discovery of gaps and for improving a tacit knowledge transfer. Computer-based ontology provides formal and structured representation of domain knowledge. It is designed to serve as a raw material for computer reasoning and computer-based agents. It provides a formally defined specification of the meaning of those terms, which are used by agents during their interoperation. It is important, because agents can differ in their understandings of environment, goals capabilities, but they can still interoperate in order to perform a common task.

a) Agent Communications and Ontology

Common agent languages hold the promise of diverse agents communicating to provide more complex functions across the networked world. Indeed, as agents grow more powerful, their need for communication increases. The two agent communication languages with the broadest uptake for exchanging information and knowledge are KQML [3] and FIPA (Foundation for Intelligent Physical). The unproductive "standards war" scenario that might have arisen at one point seems now to have been avoided, with the most active participants supporting the FIPA effort, which incorporates many aspects of KQML [3]. FIPA standardization effort, seeks to address interoperability concerns through a sustained program. This is one area in which the visibility of agent technology is strong, with some of the most active take-up efforts from early adopters as, for example, is illustrated in [2]. Despite their merit, KQML and FIPA ACL only deal with agent-to-agent communication. An agent is understood as something that can act on behalf of a human or an organization.

Communication can be understood also as main sensors for software agents, since it is how agents can learn, share knowledge and interact with their environment, by communication, [FIPAACL] based communication is meant, where as content language RDF [RDFW3C] or OWL [OWLWEB] is used. Commercial technologies like WSDL, XML-RPC, SOAP or P2P came out of MAS research area. For example WSDL and UDDI can be understood, as a subset of what FIPA ACL is capable, however for most of applications features of XML-RPC or for most

complicated interaction SOAP and WSDL is sufficient. Agents can move forward only when they incorporate existing commercial communication technologies such as XML-RPC, SOAP and WSDL, and thus they will be able to communicate within the user and other existing software systems.

b) Ontology in MAS

Ontology defines the meaning of the terms in used content language and the relation among these terms. It ensures that the agents ascribe the same meaning to the symbols used in the message. Using ontology not only allows communication between agents but also gives the possibility for agents to reason about the concept.

Ontologies are dependent on used content language. In MAS ontologies are usually simple. The best-known implementation of ontology is in JADE agent system. Real Java classes with properties represent ontology classes. Instances of classes are individuals – information that can be stored or communicated. However UML or object oriented ontology is not sufficient because, multiple inheritance, inverse properties and other features present in RDF or OWL can not be used.

V. Conclusions and Future Work

Roles represent system goal and constrain agents' behavior. They exist throughout all phases from analysis to implementation, and this is the main difference to previous works on role both in OO and in agent orientation (AO) . Such a model can enable a natural realization of dynamic bindings between agents and roles. Besides, the RBMAS method generates roles from use cases. This prevents jumping from abstract use cases to concrete entities.

The paper presents the software infrastructure introduced into the agent service framework in order to support ontology design, implementation, and management. Software ontology's are a high level abstraction which is very useful for identifying the concepts of a problem domain, to define their relation, and to reason about them. Ontologyies give an added value to the interaction among software agents since they provide facilities to define a communication and to validate messages.

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A New Approach for Automated Job Search using Information Retrieval

By Tahseen A. Al-Ramadin, Malek Al-ksasbeh & Moha' med al-Jafreeh

Al-Hussein Bin Talal University, Jordan

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Keywords: *part of speech, classification, tagging, patterns.*

GJCST-C Classification : *H.2.8*

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Tahseen A. Al-Ramadin [α], Malek Al-ksasbeh [σ] & Moha'med al-Jafreeh [ρ]

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Keywords: part of speech, classification, tagging, patterns.

I. Introduction

Certainly, independence and professionalism are very high intents. Job seekers are usually interested in attaining these requirements. Working independently, is among many ways of achieving the aforementioned requirements. Such an approach requires an appropriate position with cooperated employers and Job seekers. Therefore, every user can demonstrate his professionalism to work in the expected job.

Many ways are available for either job searching or job offering these are announcement in traditional media, recruitment agencies, headhunting, job sites and others [2]. Upon the job searching process, usually, the job seeker tries to find the Job that meets his demands. Currently, Jobs' opportunities are highly competitive based on corresponding qualifications and capabilities. Yet, job search techniques offer jobs' seekers to find his expected Job [6]. Typically , in the process of searching for a job the applicant submits the job application which will be processed by the job offering firm [7]). It is obvious that this process consist of two sides.

The first one, is the job seeker who is usually looking for getting the best available job that satisfies certain specifications . While, the job offering firm seeks for highly qualified and skilled employers who could fit the vacant position. However, meeting the demands of both sides is a tricky and complicated task which requires trough and elaborate analysis [3] One of the available applications that are used for performing such an analysis is the Application Tracking Systems (ATS) [4]. ATS is the applications that enables the electronic handling of recruitment needs. ATS is somehow similar to Customer Relationship Management system (CRM) while CRM capable of managing relationships with candidate for the job [5]

Nowadays, large companies use at least just part of the prepared forms of ATS to collect candidates' applications and manage these applications. Some companies use traditional ATS systems (e.g. HR in the IT industry proofing systems use programming skills of candidates) to perform this process.

The primary function of the tradition ATS is to ensure the collection and storage of data in a central database. Applications of candidates are normally collected by the external application forms provided by the ATS for the company recruiter. Most owners of ATS sites collaborates with producers ATS applications and thus enable their customers to migrate data from one system to another.

As stated above, The problem in most of these systems is utilizing databases, which leads to the loss of some important information for job seekers. Our proposed system tries to solve this problem by using natural language processing, and information retrieval techniques, by using the keywords from the job description in job seekers' CVs and cover letter with job announcements to increase the chances of returning a match from company's website (careers /employment page) and job seekers documents.

II. Proposed System

Our Automated job search (AJS) searches all job opportunities documents of all advertisers, searching within job seekers' CVs and find common links between them. The outcome of this process is to make a list of job seekers within the specifications required in the job opportunities documents, as well as a list of proposed functions within the qualifications for job seekers.

AJS searches job seekers' CVs for the important information needed in the proposed job such as qualifications, work experience and education. AJS system solves many occurring problems using the database, by using the keywords paraphrasing job requirements. AJS employs the saved keywords and

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their synonyms and acronyms in the table. Table (1) lists all the professionalism that will be searched in.

Table 1 : lists all the professionalism that will be searched in

Classification	Jobs Titles
Management	president, vice-president, executive officer (CEO); director, deputy director, managing director, financial director, marketing director; general manager, assistant manager, manager; personnel manager, production manager, marketing manager, sales manager, project manager; supervisor, inspector;
Office	office clerk, receptionist, secretary, typist, stenographer;
Banks	banker, bank officer, accountant, bookkeeper, economist, teller, cashier, auditor;
Medicine	doctor, physician, family doctor, general practitioner; eye specialist, ear specialist, throat specialist, heart specialist; cardiologist, surgeon, pediatrician, psychiatrist, dentist, dietician, pharmacist, veterinarian; nurse, paramedic;
Restaurants	chef, head cook, cook; maitre d', headwaiter, waiter, waitress, bartender, barman;
Sales and stores	sales representative, sales manager; salesperson, salesman, saleswoman, salesgirl, salesclerk, cashier; seller, buyer, wholesale buyer, wholesaler, retailer, distributor, advertising agent;
Art and creative work	musician, composer, singer, dancer; artist, painter, sculptor, architect; film director, producer, art director, actor, actress, cameraman; writer, author, playwright, dramatist, scenarist; journalist, reporter, correspondent, photographer; designer, fashion designer, dress designer, interior designer, furniture designer, graphic designer;
School and college	principal, dean, professor, teacher, student, pupil; schoolteacher, college teacher, university teacher; head teacher, senior teacher; English teacher, history teacher, maths teacher (BrE), math teacher (AmE), music teacher;
Construction	engineer, technician, mechanic; builder, construction worker, repairer; welder, bricklayer, mason, carpenter, plumber, painter;
Science	scientist, scholar, researcher, explorer; mathematician, physicist, chemist, biologist, astronomer; historian, archeologist, economist, philosopher, psychologist;
Computer & internet	computer programmer, computer operator; systems analyst, software specialist; web developer, web programmer, webmaster, web designer;
Travel	pilot, flight engineer, flight navigator, flight attendant; driver, taxi driver, bus driver, truck driver; car mechanic; travel agent;
Beauty	hairdresser, hairstylist, barber, beautician, cosmetologist; cleaning lady, cleaning woman, janitor
Law and order	judge, lawyer, attorney, legal adviser; police officer, policeman, traffic officer, detective; guard, bodyguard;
Other	expert, specialist, analyst, consultant, adviser; firefighter, librarian, farmer, tailor, model, politician, priest,

AJS takes into consideration many parameters that help both of the job seekers and the job offering firm in obtaining an optimum decision based on the requirements for both parties.

Our new system is expected to produce different results with different sentences which make the output dynamic and not limited to a single template as other research. Moreover, AJS follows the information retrieval and text mining techniques methodologies to extract information with intelligence trends to deeply mine the user C.V. and from the job announcement; in terms of Part of Speech (POS) and tags; these significant features that used for information extraction. In addition, some of indicator words used to recognize the proper matching.

As demonstrated in figure 1, it can be seen that our model consists of two algorithms; the first one deals with the data were provided by an interested firm, while the second one takes inputs were provided by a job seeker.

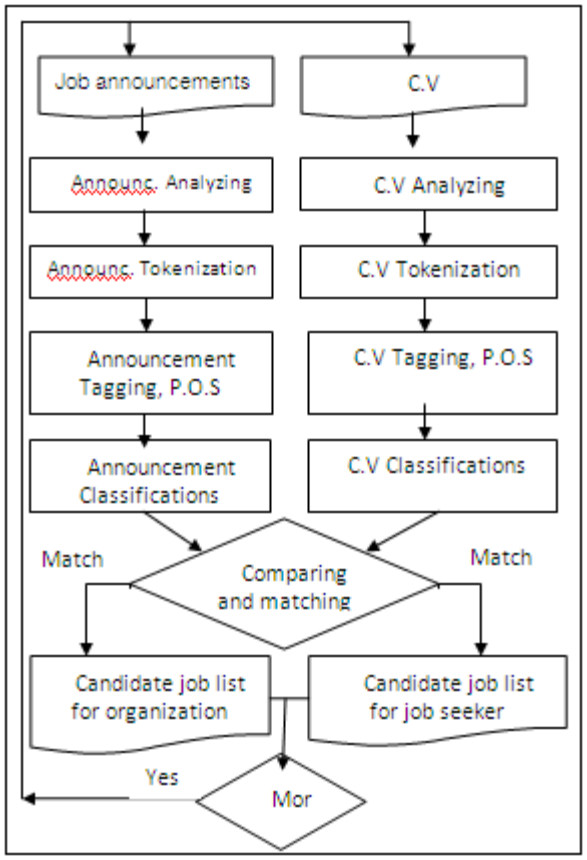

Fig 1 : **AJS model**

Algorithm 1 for employer
Inputs : Announcement
Output :list of candidate persons

1. Analyzing Announcement finding the job classification
2. Read C.V documents and analyzing
   - 2.1 Tokenization
   - 2.2 World tagging and part of speech
   - 2.3 Search for the job titles or any Synonyms
   - 2.4 If any job found
     - 2.4.1 Compare the job qualification with C.V
     - 2.4.2 If Job seeker found, AJS adds Job seeker to candidate list.
3. If there are more C.V document go to 2.
4. End

Aalgorithm 1 are used to find a list of candidate qualified persons for a specific job in the organization, first of all the announcement for the job is analyzed to finding the job title, the job descriptions, the qualifications, and experienced for the job.

AJS search the web and find any CV that match this properties which will be as follow:

- After finding C V with the job classification, splitting this document to tokens.
- By using tagging and part of speech, if any job is founding matching the qualification of the person, then add this announcement to the set of candidate person, the rules and the features used to extract the required information, A set of P.O.S patterns

was extracted by examining the job seekers C.Vs. and the announcements. Ppatterns are used to be one of the

- This search will be continuing for all CV documents.

Algorithm 2 for the job seeker:
Input: C.V
Output: list of vacant jobs

1. Analyzing C.V finding (from table) the job classification
2. Read announcement document and analyzing
   - 2.1 Tokenization
   - 2.2 Word tagging and part of speech
   - 2.3 Find the suitable job and there Synonyms from classification
   - 2.4 If any job or synonyms found
     - 2.4.1 Compare the job seekers qualification with Announcement
     - 2.4.2 If Job is found, then AJS adds it to vacant job list.
3. If there is more announcement document go to 2.
4. End.

The procedure for algorithm 2 is explained as shown in the following sequence.

As shown in the previous algorithm, the person who seeks about a job he/she will link his CV web page to AJS, the AJS will analyzing this CV and find the proper job classification and there synonym and acronyms from Table (1).

Searching for all announcement documents with the job classification will be as follow:

- After finding document with the job classification, splitting this document to tokens.
- By using tagging and part of speech, if any job is founding matching the qualification of the person, then add this announcement to the set of candidate jobs, the rules and the features used to extract the
- required information, A set of P.O.S patterns was extracted by examining the job seekers C.Vs. and the announcements. patterns are used to be one of the features that help finding the optimum job title.
- This search will be continuing for all announcement documents.

The second algorithm describes the AJS procedure from employer viewpoint as depicted in the following sequence.

III. Results

The result from this system will be to lists (reports) one for the job seeker, and the other for the organization.

The second list that is presented for the organizations that search for a qualified persons to fill a job, the list show all the candidate persons and their qualifications and experiences for this job, table 2 show an example of this list.

Table 2 : example for list of job seekers

AJS Organization name : AAAA bank Job title :cashier Job descriptions : cashier			
Candidate name	Qualifications	Experiences	Contact
J. S. Jobseeeker		3 years	
		4 years	
		2 years	

The second list will be for the person who tries to find the optimal job for him, so there will be a list of all organization and the jobs description and the contact ways for this organizations that match the qualifications and experience for this job seeker. Table 3 gives an example for this list.

Table 3 : example for list of jobs

AJS			
Job seeker: J. S. Jobseeeker Qualifications: Experiencers : Date: 2-2-2015			
Organization	Job title	Descriptions	Contact
AAAA bank	cashier		AAA@BANK.COM
BBB COMPANY	cashier		BBB@MAIL.COM ++99 88 777777777
CCC OIL	cashier		CCC@COM.NET ++99 77 666666666
DDD INVISTMENT	cashier		INDD@MAIL.NET WWW.DDDINVISTMENT.NET

III. Conclusion

Our proposed system AJS produced two lists; first list is presented for each Organization that contains their vacant jobs and corresponding with qualified job seekers' contacts who have appropriate skills and experience, while second list is presented for each job seeker who linked his CV by AJS with suitable vacant jobs and correspondent organizations' contacts.

IV. Future Work

The researcher is expected to extend this system by adding third party as administrator who prioritizes the two lists based on the experience and qualified skills of job seekers for organization list and based on organizations' offers for job seeker list. The administrator uses right decision support system to make the prioritization

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Effective Detection and Prevention of DDoS based on Big Data-Mapreduce

By Sumathi Rani Manukonda & Dr. Koppula Srinivas Rao

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Abstract- Distributed Denial of Service (DDoS) attacks is large-scale cooperative attacks launched from a large number of compromised hosts called Zombies are a major threat to Internet services. As the serious damage caused by DDoS attacks increases, the rapid detection and the proper response mechanisms are urgent. However, existing security methodologies do not provide effective defense against these attacks, or the defense capability of some mechanisms is only limited to specific DDoS attacks. Therefore, keeping this problem in view author presents various significant areas where data mining techniques seem to be a strong candidate for detecting and preventing DDoS attack. The new proposed methodology can perform detecting and preventing DDoS attack using MapReduce concepts in Big Data.Thus the methodology can implement for both detecting and preventing methodologies.

Keywords : *DDoS attacks, data mining-big data, mapreduce.*

GJCST-C Classification : *C.2.4 E.2*

Strictly as per the compliance and regulations of:

Effective Detection and Prevention of DDoS based on Big Data-Mapreduce

Sumathi Rani Manukonda[α] & Dr. Koppula Srinivas Rao[σ]

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Keywords: DDoS attacks, data mining-big data, mapreduce.

I. Introduction

Today, the number of attacks against large computer systems or networks is growing at a rapid pace. One of the major threats to cyber security is Distributed Denial-of-Service (DDoS) attack .In which the victim network element(s) are bombarded with high volume of fictitious attacking packets originated from a large number of Zombies. In the modern computer world, maintaining the information is very difficult. Some interrupts may occur on the local system (attack) or network based systems (network attack). The aim of the attack is to overload the victim and render it incapable of performing normal transactions.In this paper a new cracking algorithm is implemented to stop that DDOS attacks. This is most critical attack for a network called distributed denial of service attack.To protect network servers, network routers and client hosts from becoming the handlers, Zombies and victims of distributed denial-of-service (DDoS) attacks data mining approach can be adopted as a sure shot weapon to these attacks. Without security measures and controls in place, our data might be subjected to an attack. In our algorithmic design a practical DDOS defense system that can protect the availability of web services during severe DDOS attacks. One common method of attack involves sending an enormous amount of request to the server or site and server will be unable to handle the requests and site will be offline for some days or some years depends upon the attack.

The proposed system identifies whether the number of entries of client exceeds more than five times to the same sever, then the client will be saved as a attacker in blocked list and the service could not be provided. So our algorithm protects legitimate traffic from a huge volume of DDOS traffic when an attack occurs.This approach uses the automatic feature selection mechanism for selecting the important attributes using the Map Reduce methodology. And the classifier is built with the theoretically selected attribute through the neural network. And then, our experimental results show that our approach can provide the best performance on the real network, in comparison with that by heuristic feature selection and any other single data mining approaches.

II. Overview

a) DDoS ATTACK

Distributed Denial-of-Service (DDoS) attack is the one in which the victim's network elements are bombarded with high volume of fictitious attacking packets that originate from a large number of machines.

In Recruiting phase attacker initiates the attack from the master computer and tries to find some slave computers to be involved in the attack. The number of DDoS attacks grew 20 % last year - a major decrease in the rate of attacks from 2007 to 2008, when these devastating attacks increased 67 percent, according to a report.1 According to a report Internet Service Providers (ISPs) are most worried about botnet-driven distributed denial-of-service (DDoS) attacks2 .A small piece of software is installed on the Zombies to run the attacker commands. The Action phase continued through a command issued from the attacker resides on the master computer toward the Zombies computers to run their pieces of software. A successful attack allows the attacker to gain access to the victim's machine, allowing stealing of sensitive internal data and possibly cause disruption and denial of service (DoS) in some cases. The mission of the piece of software is to send dummy traffic designated toward the victim. Therefore, a mechanism that is strong and reliable is desired. Hence

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the key idea is to use data mining techniques to discover consistent and useful patterns of system features that describe program and user behavior of attack.

III. Data Mining Data

Data mining is becoming a persistent technology in activities as diverse as using historical data to predict the success of a marketing campaign, looking for patterns in network traffic to discover illegal activities or analyzing sequences. A data mining application is typically a software interface which interacts with a large database containing Network traffic parameters or other important data. From this outlook, the approach is gaining importance in the field of DDoS attacks. Data mining applications are computer software programs or packages that enable the extraction and identification of patterns from stored data.

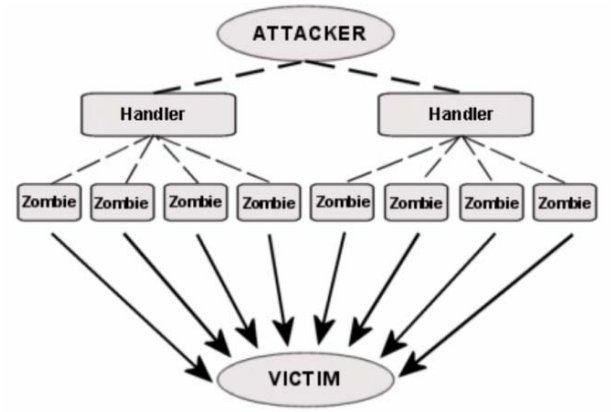

Figure : Architecture of DDoS attack

Data mining is, at its core, pattern finding. Data miners are proficient at using specialized software to find regularity (and irregularities) in large & complex data sets. Data mining is widely used by companies and public bodies for marketing, detection of fraudulent activities such as DDoS attacks. Huawei 2013 Security Research Report 29.81% more DDoS attacks occurred than last year, More than 72.91% attacks larger than 1Gbps. Http application protocols Attacked up to 87.74% and Longest DDoS attacks last 349 hours 36 minutes 42 seconds.

IV. Various Application Areas of Data Mining in Ddos Attacks

Recently, data mining has become an important component for DDoS attack prevention. An overview of real time data mining-based intrusion detection systems (IDSs) is presented by researcher that focused on problems related to deploying a data mining-based IDS in a real time environment also discussed a distributed architecture for estimating cost-sensitive models in real time.

Different data mining approaches like classification, association rule, clustering, and outlier detection are the few techniques frequently used to analyze network traffic or data to gain knowledge that helps in controlling intrusion Various applications where data mining approach can be used in prevention and detection of DDoS attacks are discuss below:

V. Implementation

a) Big Data-Map Reduce

i. *Map step*

The average output of the map will be recorded ID as the key and retired as the value. Every mapper maintains a collection bearing the canopy center candidates it has learned thus far. During every map the mapper determines if each successive record is within the distance threshold of any already determined canopy center candidate. The intermediate output sent to the reducer has the record ID as the cay and the list of retired-rating pairs as the value.

ii. *Reduce Step*

The yield of the reduce step will simply output record ID as the key and concatenate the rater IDs for that record into a comma separated list. The reducer repeats the same procedure as the mappers. It meets the candidate canopy center record IDs, but takes out those which are inside the same threshold limit . In other words, it removes duplicate candidates for the same canopy center. In order for this to operate correctly the number of reducers is set to one.

iii. *DDoS attack impact on Big Data*

As the Internet continues to grow and prosper, hacker attacks continue to increase in severity and frequency. As Internet bandwidth has expanded, so too has the scale and frequency of DDoS attacks. For example, in March 2013, European anti-spam company Spamhaus experienced multiple 300 Gbit/s DDoS attacks, the largest such attacks in history. The real-time example, Huawei is the first anti-DDoS solutions provider to apply Big Data technology to DDoS detection and prevention. Huawei leads the industry in eliminating covert DDoS attacks disguised as normal access requests.

iv. *DDoS Trends Challenging Attack, Defense Technologies*

Typically, DDoS attacks originate from mock sources, such as Synchronize (SYN) flood, User Datagram Protocol (UDP) flood, and Domain Name Service (DNS) flood, and are carried out by zombie hosts. When DNS servers are paralyzed a wide range of network services will be blocked or broken.The more bandwidth the attack consumes, the bigger the threat to network infrastructure. Such attacks that target specific applications, such as HTTP Flood attacks against e-

commerce websites and web games, require a TCP connection between the zombie host and servers targeted for attack. To avoid detection, hackers reduce the attack traffic rate so that the attack footprint resembles a legitimate request.

VI. Framework & Algorithm

These heavy-traffic DDoS attacks are the easiest to detect, but require the highest processing performance to affect the necessary rapid response; otherwise, the network links will become jammed, completely flooded, while security devices deployed on the access side are failing. Until the recent arrival of cost-effective flow analysis technology, these super-large-bandwidth DDoS attacks were best handled by commercial anti-DDoS SPs. Blocking such attacks requires the deployment of super-large capacity prevention systems on the upstream side of the network. Effective enterprise anti-DDoS systems must be based on high-performance hardware platforms with a minimum 100-Gbit/s defense capacity, or the defense device itself will likely become the network bottleneck. We have now entered the era where these high performance tools are now available for enterprises.

Because DDoS attack detection systems rely on traffic models for attack detection, the better the traffic model the higher the probability of detecting attacks. The difficulty in detecting light-traffic attacks is that the small numbers of attack packets are concealed in massive volume of legitimate network access packets. A further challenge to detecting low volume DDoS attacks is that application layer attacks strongly resemble legitimate access requests, and that even with increased sampling rates, flow analysis is unsuitable for detecting application layer attacks because QPS analytics are not included in the access traffic model. Mitigating this type of attack using traditional prevention systems can only limit the connections of legitimate access sources.

a) DDoS Defense Technology Based on Big Data -Map Reduce

As an industry-leading anti-DDoS solutions provider, Huawei is the first vendor to apply Big Data technology to the detection and prevention of covert DDoS attacks disguised as normal access requests.

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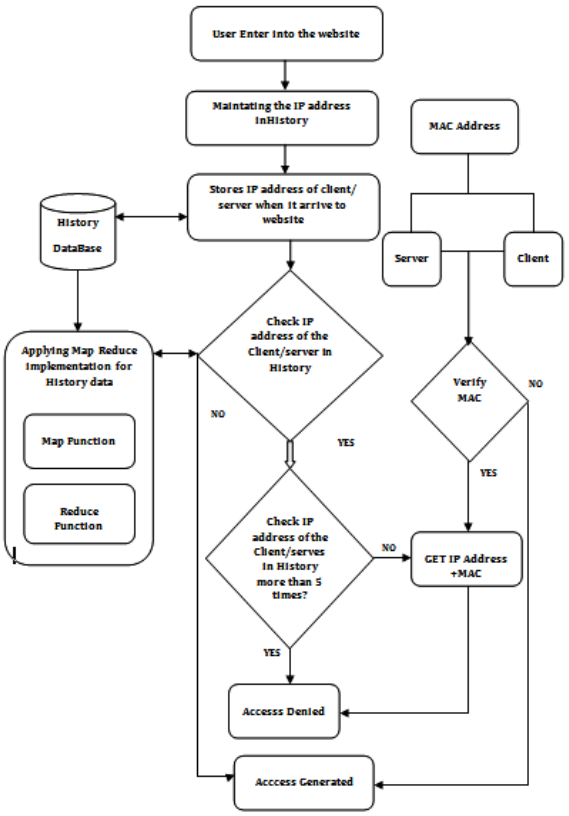

Figure : Framework

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New algorithm using the Map Reduce Methodology
H=Maintaining IP address as History;
U=User enter into website;
I=Storing Each Client IP address;
N=New IP address;
MACM =Mapped MAC/IP Address
MACR =Reduced MAC/IP Address
MACN =New MAC/IP Address

Start the Process
Check each time U in server, If ((I==H)==N) { Else If (I<5)
{
IP=Get the IP address;
MaP((I value & H)U), /(Applying MaP FUNCTION to I&H*
*with User web address / IP Adress) */*
{
FOR each{ U,I value}in {(I,H value) },//mapping (split) key values/ pairs
do
MACM=(U,I value) ∪H
Return MAC;
}
REDUCE((I value & H)U,MACM), /(Applying REDUCE FUNCTION to I*
*value of User in H) */*
{
FOR each {(I value ,U) €H ,MACM},//reducing (merg) key values/ pairs
do
MACR=(U,I value) ∩H
}
MACN 1=IP+MACR // Read Previous MAC
Algorithm Server=MAC1;
Client=MAC1;
If (Server=Client)
{
Accept the request from the client Send the response for the request.
}
Else
{
Add the User.IP to the Attacker List,
Print: "Access Denied"
} } }
Else
{
Accept the request from the IP Send the response for the request.
}
End

d) Challenges

- *High security:* The security solution must be able to defend against DDoS attacks of various types, regardless of the traffic attacks or application-layer attacks, to protect all online services from attacks.
- *High performance:* To avoid being the bottleneck of the whole system, the security solution must feature high-performance defense capabilities so that it can deal with the traffic flooding attacks on Tencent's large-scale services.
- *High scalability:* The security solution must support flexible performance expansion to vary with service requirement changes, catch up with service mode innovation, and form an architecture required for long-term service development, in order to protect previous investment and reduce total investment cost..
- *High availability:* The security solution must ensure reliable service connections, precisely differentiate attack traffic from normal traffic, and accurately identify attacks
- *Low O&M cost:* Considering that O&M cost significantly affects Tencent, the security solution must be small-sized, consume low power, minimize occupied equipment room space and consumption with improved performance, and greatly reduce the TCO for deploying multiple nodes in batches.

VII. Conclusion

DDoS attacks are quite complex methods of attacking an ISP in large data. These attacks are an aggravation at a minimum, and if they are against a particular system, they can be brutally destroyed. This paper discussed various detection algorithms which are using data mining concepts &algorithms for DDoS detection & prevention. The proposed methodology we can detect the attack easily by implementing Map Reduce functionalities at the stage of verifying the Network IPs. Loss of network resources, costs money, delays work, and interrupts communication between various legal network users , thus it can prevent all these complexities effectively. Detecting, preventing, and mitigating DDoS attacks is important for national and individual security. But with the improvement in technology new areas are emerging where data mining techniques can be utilized for handling DDoS attacks that are to be discussed in future.

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Design of Transmission Pipeline Modeling Language

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Abstract- General purpose software design and development involves the repetition of many processes, and the ability to automate these processes is often desired. To formalize a software process, such as modelling pipeline systems that transport fluids, an existing general purpose programming language (GPL) can be extended with its important aspects extracted as a model. However, the complexities and boundaries the programming language places on the ability to concisely and clearly describe the designing and modelling processes of the pipeline configurations can be difficult. The reality is that the library of a typical GPL Application Programmers Interface (API) constitutes class, method, and function names that become available only by object creation and method invocation, and as such cannot express domain concepts effectively. An alternative approach is to develop a language specifically for describing the processes. A language formalism that encourages domain specific development and as a tool for solving the complex problem of efficiently and effectively aiding the pipeline engineer in the design and implementation of pipeline configurations is presented in this paper. The language tool is used on the .Net platform for domain specific software development.

Keywords: pipeline engineering, modeling languages, design principles, domain-specific modeling (dsm), model transformation.

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Design of Transmission Pipeline Modeling Language

Japheth R. Bunakiye [α] & Prince O. Asagba [σ]

Abstract- General purpose software design and development involves the repetition of many processes, and the ability to automate these processes is often desired. To formalize a software process, such as modelling pipeline systems that transport fluids, an existing general purpose programming language (GPL) can be extended with its important aspects extracted as a model. However, the complexities and boundaries the programming language places on the ability to concisely and clearly describe the designing and modelling processes of the pipeline configurations can be difficult. The reality is that the library of a typical GPL Application Programmers Interface (API) constitutes class, method, and function names that become available only by object creation and method invocation, and as such cannot express domain concepts effectively. An alternative approach is to develop a language specifically for describing the processes. A language formalism that encourages domain specific development and as a tool for solving the complex problem of efficiently and effectively aiding the pipeline engineer in the design and implementation of pipeline configurations is presented in this paper. The language tool is used on the .Net platform for domain specific software development.

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I. Introduction

Domain concepts are representations of fundamental features inherent in specific fields of human endeavour. From these concepts models often referred to as the domain model, which characterize things in the domain can be derived. The description of concepts in this work was a domain analysis exercise, targeted at the salient technical characteristics prevalent in the domain of oil and gas pipeline engineering [18]. What happens is that pipeline components such as pipe cross sections, joints, fittings, and other pressure containing ones are produced with AutoCAD; these products usually referred to as graphics models now represent the pipeline components model from which the concepts for the language construction were derived [14]. It followed a precise path from specification of modelling primitives to formal feature models that moved into the formation of a language metamodel.

One purpose of a model in this circumstance is to reflect the control-flow of the design process without incorporating nonessential properties. To this end, the behaviour of meaningful design scenarios can be depicted in a metamodel [2]. In order to effectively incorporate stakeholders design intents and to ease the modelling processes, the domain specific modelling (DSM) approach was adopted. The DSM approach sees the model as the core entity throughout development and is basically a platform for language development. A language is therefore designed to specify the model. The language description entails flexibility, so that the pipeline context model can be applied productively[1].

In addition to providing a design framework for correctly fixing the application of the pipeline context model, modelling allows the pipeline systems designers to explore many different designs before representation. It is observed that computer aided design (CAD) software such as AutoCAD are indispensable tools in the pipeline engineering work environment, but most pipeline engineers find it worrisome to learn, understand and use conventional computer aided design (CAD) software in their line of business [3]. Modeling with AutoCAD for example has been ccomplex processes that are too costly to actually implement and refine. Modeling in a domain specific modeling system allows the modeler to easily modify the process and determine if the changes are effective.

The advocated shift in the design environment is domain specific modeling, which resolves many of the problems inherent in the protocol based GPL/ CAD systems design standard. In this approach, the metamodeling mechanics allows the stakeholder to determine the intents on an interface with very familiar notations, which means the design complexity is drastically reduced and control transferred from the complex CAD system to the domain expert. This allows the pipeline engineer to simply input familiar notations *(i.e. pipeline engineering concepts that are very familiar to them e.g. pipe diameter, fittings dimensioning, flow metrics etc.)* on an interface to get the kind of design, simulation artifact and other pipeline configurations without having to use any CAD or related system [5]. Domain specific modeling involves the logical use of models as core entities throughout development; it is

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simply a domain specific modelling language whose type systems and semantics will formalize the structure, behaviour and requirements within the domain of oil and gas transmission pipeline engineering. The transformations from the AutoCAD objects to the language formalism are typically designed starting with abstract concepts and are iteratively refined into detailed descriptions. Therefore, the language needs to reflect this *transmission pipelines* development cycle, and can still provide valuable information about the process at every level of abstraction [9].

II. Related Work

A very recent language formalism implemented by Phillip et al. [12] is a methodology addressing issues surrounding a scheme for modeling, scalability and accessibility to modeling and verification processes for practitioners within the railway domain. Their work introduced a methodology for developing domain specific languages for modeling and verification that aims to aid in the uptake of formal methods within industry. It also concretely illustrates the success of this methodology for the railway domain. This present work has acknowledged the design methodology and the specification patterns of the domain specific language for the application in the Railway industry as presented by Philip et al [12]. In our approach we have made efforts to move away from the use of the Generic Modelling Environment (GME) suite for specifying modelling concepts. The challenge in the UML paradigms is the lack of a semantic definition within the context of the metamodel. This problem has negative impact on reusability of DSMLs, because a well-made DSML captures the concepts, relationships, integrity constraints, and semantics of the application domain and allows users to program declaratively through model construction. Incorporated in our metamodel is a semantic module to alleviate this challenge.

Milan et al. [11] discuss a method for designing modelling languages by presenting a platform independent model (PIM) for information systems (ISs). The concepts are described by Meta Object Facility (MOF) specification, one of the commonly used approaches for describing meta-models. One of the main reasons for this technique is to specify the concepts through the meta-model, as well as a domain analysis purposed at creating a domain specific language to support IS design. As such, it complements our technique, which is a top down approach. Similarly, Christian Hahn and Klaus Fischer [13] presented a UML based domain specific modelling language for multi-agent systems (DSML4MAS), in their approach the language semantics are restricted only to the definition of concepts and their relationships within the metamodel. UML is not an end user representation language, and so domain specificity couldn't possibly be better represented then our approach. The focus of Jonathan Sprinkle et al. [10] research uses endogenous refinements approach to analysing models on a shred metamodel with only evolutionary changes. Starting with a set of rules, model transformation was automated between the source and the target environments all in the same problem space. Conceptually, this work is closely related to ours, but we transformed a seemingly graphical domain model to a textual application model for user interaction.

III. The Language Design Considerations

The consideration is modelling pipeline design including pipe sections joined with fittings and other supports features such as flanges, bolting, gaskets, valves, hangers and the pressure containing portions of pipeline components [7]. A pipeline design dedicated for transmission of oil and gas from wells to tanks for storage or to refineries for processing. The pipe sections joined with fittings etc. are here referred to as the pipeline model; they are graphics models, solid objects aggregated from primitives of AutoCAD that depict the typical pipeline fundamentals, materials and joints in situ that forms the instances of the language creation [18] .

a) *Capturing the aspects of design*

Domain specific modeling of solid objects such as oil and gas pipeline components comes in different forms. Although there are many different ways to modelling, very common steps that capture the aspects of designing a modelling language that exemplifies stakeholders design intents in the domain of oil and gas pipeline engineering are presented below. The identified ones are:

- *Effortlessness:* the design aspect has to capture metrics that can enable a non-programmer or a non-technical domain expert model a pipeline design without necessarily writing lines of codes
- *Tractability:* the language design should capture applicability tailored to stakeholders design intents and view points
- *Reflectiveness:* the language should be able to accurately reflect a pipeline design scenario in order to correctly represent useful artefacts i.e. the language should be able to evolve products that can reflect oil and gas pipeline design artefacts
- *Passability:* the language design has to capture the aspects of symbolizing the actual execution of a pipeline transmission process

These steps are clearly stated in the language design specifically to achieve significant functionality

These steps are clearly stated in the language design specifically to achieve significant functionality during implementation [6]. In conventional engineering design modeling, objects are explicitly described, for this reason, when one aspect of the model is changed; often several changes have to be made to satisfy design intent or the implicit rules of the design. All these changes have to be made because the software [19] does not keep track of the rules and the modeler must decide where and when they are broken. In AutoCAD, for example models are created in a conventional way. AutoCAD, however, comes with more than one programming environment for creating a set of instructions, including the rules and constraints of the design as well as parameters defining certain aspects of the design, which can be used to build a model [7]. These instructions can be used to build the model from scratch, each time using the same parameters, or experimenting with different ones. The parameters can be numeric values, relationships, and can even include graphic parameters already existing in the model (e.g., a building lot, angular pipes, etc.).

The programming environment makes it possible to define variables [18]. It also allows conditional branching to different sets of instructions in the program and can repeat the instructions until a condition in the program or model is met. This capability of defining solid behaviours through variables fosters model interaction in such a way that transfer of information is only possible within the set conditions in the CAD system [5].

One basic consideration and challenge is the issue of interaction between models, interactions in the way of concepts devoid of possible parametric constraints within a CAD system [20]. Interactions that can produce other complete models with noticeable properties relative to a given set of concerns in relevant domains that captures accurately and concisely all of its interpretation and design intent for specific problems and solutions. This has not been achieved with current CAD systems, and coupled with the third generation programming APIs inherent in them, they still lack sufficient linguistic power to handle domain and platform complexities and hasn't moved speedily with domain technologies [19]. Model interactions that creates new objects that encapsulates and relates the details pertinent to the viewpoint of domain experts is still lacking in current CAD/GPL modeling systems.

This constrains the expressiveness of the modeling systems, and the primary concern with this limitation is that it is a limitation imposed by the systems internal construction and technologies. Additionally, how the designs will be created depends on the underlying APIs and how the design will execute once compiled. In domain specific modeling, the modeler may want to experiment with familiar domain notations to obtain feedback. Therefore, a new language design is needed that focuses on and represents the concepts of domain models rather than relying on CAD systems and programming languages [9]. The believe is that such software development efforts will enable stakeholders to cope with platform complexities, it will also be cost effective, save time, and raise productivity levels [8].

b) *The Methodology*

The approach is hinged on examining the requirements of a modeling language for the oil and gas transmission pipeline domain. The requirements criteria are based on getting the pipeline models from AutoCAD and making them to represent things in the pipeline engineering domain. The aim is to take away the design and programming complexities associated with any CAD/GPL systems. The expectation of adopting this methodology is a pipeline systems modeling language (PSML) [2], which fundamentally, should support pipeline engineering concepts rather than relying on function calls and method invocations inherent in programming languages. There are quite a number of implications to this design methodology: the language is user friendly, showcases concrete syntax of domain notations that makes it more attractive to domain experts without programming expertise. Another implication is that the context free grammar is recursively defined to capture only oil and gas pipeline physical components configurations and constraints [6].

The syntax and semantic definitions of the language were clearly defined to exemplify our approach. The semantics are precisely defined and specified as denotational units to capture concurrency, and communication abstractions of the features of the pipeline product family. PSML incorporates a language construct called a *translator*, which is a process oriented specification that computes the resource request tendencies from the application model, which allows the stakeholder to evolve designs according to the defined viewpoints. In the core of the grammar is the vocabulary of components and associated attributes and values, which are transferred into an instruction sequence corresponding to any particular feature model as the modelling element. The translator does the transfer through a translation scheme based on syntax directed translation. The attributes such as angle, units, length, and size from the vocabulary of components keeps track of the resulting design object once a request triggered by stakeholders design intent is made into the system [17]. To achieve this possibility, the non-terminals such as fitting type (flange-ft.) and type name (elbow-T) etc. are marked with the attributes-angle, units, length, and size, and value points(x, y, z),and must be available when referenced within the instruction sequence of the context free grammar (CFG). The translation scheme which serves as the translation engine now enables the processing of these modelling elements into new artefacts [16]. In the operational

sequence (i.e. integrating the semantic elements) of the translation scheme, the grammar symbols associated with attributes in the CFG are rendered semantic actions inserted within right sides of the productions [2], so from each non-terminal, a value function that has a formal primitive parameter for each inherited attribute is made. The values are then returned to complete translation with the correct tokens specified.

c) The Language Rudiments

The predominant factor of an engineering design process is a task on the interactive aggregation of graphics primitives, graphics assemblies and subassemblies of CAD systems, which can be used interchangeably to produce solid model. With this language it is simply a modeling action, the PSML syntax for a modeling action is:

$$modeling\ identifier\ \{\dots\dots\dots\dots\dots\}$$

The resultant language rubrics are simply defining notations for the concrete syntax. The possible representations of the model are denotational semantic algebra as follows:

$$concrete\ syntax\ semantic\ algebra$$
$$\{$$
$$modeling\ define\ \{\}$$
$$modeling\ command\ \{\ \}$$
$$modeling\ design\ \{\ \}$$
$$modeling\ test\ \{\ \}$$
$$\}$$

Though presented here is not enough details about this high level descriptions, it provides information about what steps need to be completed and the order in which they should be performed in order to trigger a modeling action.

IV. Modeling Primitives

The modeling primitives are the resources to creating a pipeline model that creates the platform for tackling the complexity of CAD systems being unable to express domain concepts effectively. The ability to express domain concepts effectively allows the domain expert to recreate a variety of interdependencies that occur within a modelling process. The language logic allows modeling actions to require and provide resources, which typifies the need for the production of a transmission pipeline model. Using the *option* constructs, valuations can be initiated to provide more optional and variable entities for a particular modeling action. The optional entities are functions defined recursively over abstract syntax arguments that do denote unique scenarios as follows:

$$modeling\ define$$
$$\{$$
$$option\ \{function\ \}$$
$$provides\ \{statements\ \&\&attributes\ \}$$
$$option\ \{end\ \}$$
$$\}$$

Some conditions must be met for the modeling definitions to be precise, the statements provided ensures that the definition standards are correctly put in place. Now the *option* action for the valuation functions cannot be possible unless the statements and the pipeline components attributes are available for processing. Using these primitives, a stakeholder can initiate interdependencies that could exist within a pipeline design by specifying aspects of its functional quality. Though the syntax is the pipeline domain organizational structure with the semantics indicating the configuration constraints such as attributes, relationship, interdependencies, and changes in system states due to compositions and domain-specific pipeline domain operational rules; specific qualities of attribute resource are essential in keeping track of domain specific relevant information [17]. The information is tagged with the pipeline component attribute values, so that in the end the vocabulary can be transferred as attributes into the instruction sequence in the language construct. The set of semantic rules and attributes (*A*) associated with each grammar symbol; value types such as string, real, and arity, and terminals are all assigned functional dependencies. The attributes are provided to describe the state of a resource and thus it would be clearer to state attributes as follows:

$$Attributes\ \{component.length.angle.thickness.size == 'complete\ design'$$

Attributes not only describe the state and specific qualities but also provide a means to describe changes to resources. They also provide some control over the translations from what the domain specific language does and what is carried out in real life. Through the attributes the vocabulary bridges the semantic gap between writing lines of code and design intents of stakeholders; this is made possible by raising abstraction levels of the problem domain and mapping these abstraction levels to appropriate concepts in the application domain. The statements are essentially necessary steps towards describing the state of the attribute of a resource in the application environment with the correct state after execution.

V. The Design Paradigm

There are some mechanisms put in place for describing the operational mode and control of a design. These mechanisms, which reflect the constructs for the operations designate the system flow in designing a pipeline model.

a) The CFG Instruction Sequence

The instruction sequence is the context free grammar in BNF notation. It is the repository of

specifications that guides the fundamental flow of instructions in the systems internal mechanism. The CFG design specifications are as follows:

$CFG\ instruction\ sequence$
{
$\boldsymbol{modeling}\ type\ name\{pipe-type\ \&\&\ fitting-type\ \&\&\ joint-type\ \&\&\ instrument-type\ \&\&\ support-type$
$\boldsymbol{modeling}\ \ attributes\ \{length\ \&\&\ size\ \&\&\ angle\ \&\&\ thickness\}$
{
$\boldsymbol{modeling}\ units\{double\}$
}

To start and complete a pipeline design, the CFG instruction sequence has to be accomplished in the internal mechanism to attain valid demonstration.

b) Repetitive tasks

This design step takes into consideration some conditions that occur quite frequently within the design process. A necessary condition is the repeating of certain vital steps whenever a particular design scenario returns. Following the functionality in the instruction sequence, the syntax for the iteration is specified to determine what repetitions need to be evaluated and affected:

$Repetitive\ tasks$
{
$\boldsymbol{modeling}\ type\ name$
{
$pt\{model == pt.val\}$
$ft\{model == pt.val\}$
$jt\{model == pt.val\}$
$st\{model == pt.val\}$
$it\{model == pt.val\}$
}
$\boldsymbol{modeling}\ attributes$
{
$pt\{add.type == id.token\}$
}
$\boldsymbol{modeling}\ units\ \{add.type == id.double\}$
}
$\boldsymbol{modeling}\ execute\ \{\ \}$

Although there are many conditions in the modelling process that are based on human judgment, when determining the path to take in PSML, the primitives of the first modelling action actually allow the process to be more dynamic by providing multiple options.

c) The Decision repository

This is the store house of the specifications of the semantic domain and its operations as depicted in the semantic algebra. The pipeline is the root concept, meaning that it is the target result of all the underlying interdependencies of the components interactions. The decision procedure for determining which path to take clearly describes the structure of the oil and gas pipeline domain and how its elements are used by the functions, which makes it easier to analyse the semantic definition concept by concept. The specifications are as follows:

$Pipeline\ root\ concept$

$\boldsymbol{modeling}\ first\ selection\ \{build\ pipeline == build\}$
$\boldsymbol{modeling}\ second\ selection\ \{size == dimension\}$
$\boldsymbol{modeling}\ third\ selection\ \{builder *\}$
}

In line with the earlier showcased modelling primitive's description, the processing of these primitives to artefacts is depended on the pipeline design configurations.

d) Traceability

This operational construct specifies a set of parallel actions within a pipeline build process:

$Traceability\ \{$
$\boldsymbol{modeling}\ build\ pipe$
{
$pipe == (); (double)$
$fitting == (); (double)$
$joint == (); (double)$
$support == (); (double)$
$instrument == (); (double)$
$angle == (); (double)$
$size == (); (double)$
$size == (); (diameter-inner\ (float))$
$size == (); (diameter-outer\ (float))$
$thickness == (); (int)$

$units == (); (double)$
$points\ x, y, z == (); (int)$
$pipe.join.method.thispipe.p(0.1)$
}
}

Parallelism is employed here generally to allow for the performance of the embedded actions that pertain to model execution. At this point, the language interpreter decides the path because the dynamic nature of the pipeline build processes does not adhere to the strict nature of programming languages.

VI. Progressive Language Features

The semantic module in this instance is an abstraction that describes the semantics, the syntax, the necessary parsing dynamics and the resultant abstract

syntax tree. What this means is that the language metamodel reflects the problem domain abstractions; incorporating domain concepts and associated rules in a detailed denotational semantic algebra presented in figure 1 to provide for better translation interpretation [22].

$$New \rightarrow name: String \rightarrow pipeSlope\ record$$
$$New \rightarrow name\ (name) = (name, fittings, parameter)$$
$$Move-to-position: Pipe-rec \rightarrow Pipe-rec$$
$$Move-to-direction\ (parameter) = (parameter \downarrow named\ quantity),$$
$$\ldots\ldots\ldots\ldots$$
$$Compute-pipeFlow: Pipe-rec \rightarrow fittings$$
$$Compute-pipeFlow: Pipe-rec \rightarrow joints$$
$$Compute-pipeFlow: Pipe-rec \rightarrow supports$$
$$Compute-pipeFlow: Pipe-rec \rightarrow instruments$$
$$\ldots\ldots\ldots\ldots$$
$$Compute-position\ (pipe-rec) = (cases\ (Pipe-rec \downarrow named\ quantity)$$
$$Compute-direction\ (parameter) = (cases\ (parameter \downarrow named\ quantity)$$

Figure 1 : Semantic Algebra of Resources

The editor defines the concrete syntax and creates interactive notations the end user will utilize to build his model. The target code layer is the rule processing module and code generator that enforces the rules defined in the metamodel. Bringing together all these modules into a unified modelling infrastructure covers the scope of the new system. Three collaborative sub-systems that can make the artefact orientation very feasible are suggested [23, 26]. The first phase is the domain model, which captures the metrics of the pipeline engineering field. The second layer is the user interface or application model that enables stakeholder interaction with the system and then a solution model that integrates the parsing mechanism for production of desired designs. As far as experts could see through to a design scenario, the system will be able to capture it and evolve a design that meets their needs. The user could make some input through guided notations from the interface, and the system can then match these inputs with a parsing grammar to produce desired designs. Internal communication among these phases is enforced and can be made possible by utilizing the .NET CLR Object Serialization system function tool set [64]. This denotationl definition of pipeline resources capturing the repository for the concepts of the language vocabulary, the domain abstractions and semantics, can allow users to perceive themselves as working directly with domain concepts [17].

VII. Discussion of Results

The tool is designed to translate a domain model which represents the relationships and classes of the core features of the application domain into a text template; resulting to the user interface environment [21]. The procedure for mapping to the text template is relatively through an object binder that specifies the event states.

a) The Domain Model

The domain model comprises the pipeline atomic and composite features [21]. The language encompasses in its domain model sound underlying pipeline engineering principles pertaining to the language keywords (see fig. 2), and how they are linked to produce a total life cycle approach to pipeline systems design and operation.

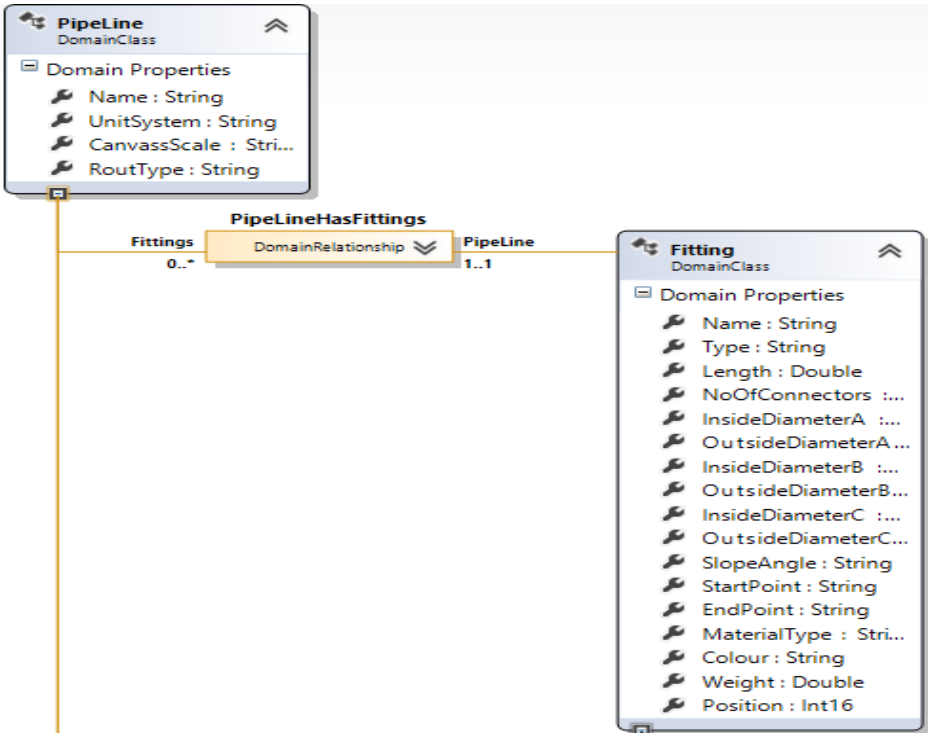

Figure 2 : Pipeline Engineering Principles

Figure 3 is showing how the language resources are related to produce a total pipeline system design operation. These relationships captured as all the semantic behaviours of the essential components and attributes, are the user centred composition rules of the semantic model comprising the events handler.

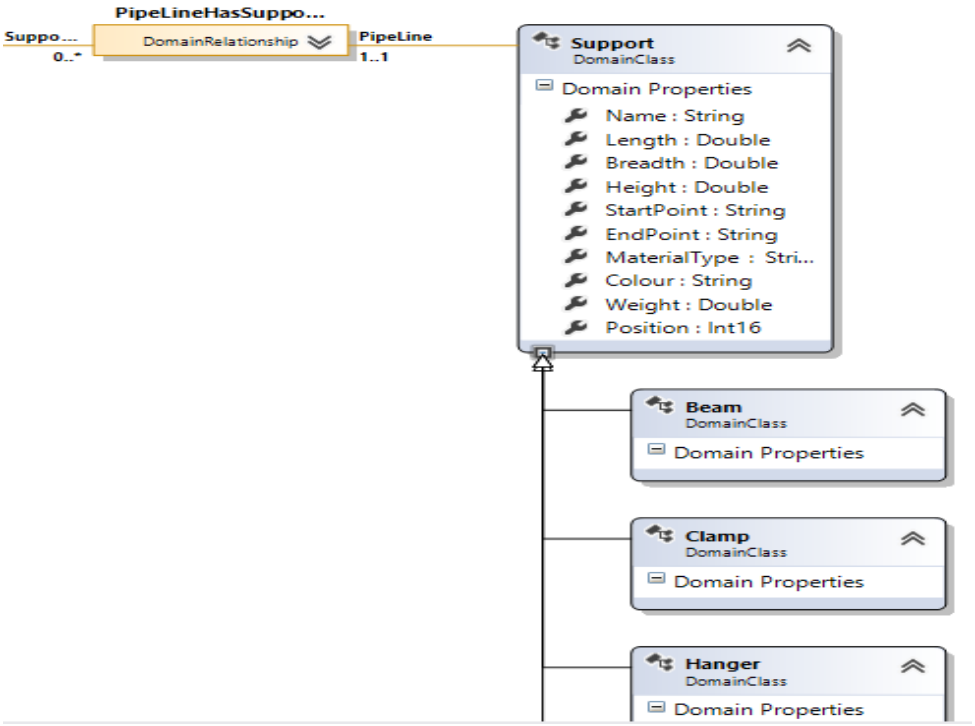

Figure 3 : Domain Model Relationships

b) Data Binding

In order to evaluate these semantic behaviours as the overall performance of the modelling system, a text template transformation is automatically performed via data binding. The data binding process is automated to be an object binder from the .net platform that specifies the event states. The events become more vivid as text inputs from the UI, what happens is that the components container binds the data source from the internal representations to the PSML model. Shown in figure 4 is the code snippet for the data binding action that results in the UI.

```
partial class PipeLineControl
    {
        public IContainer Components { get { return components; } }

        /// <summary>Binds the WinForms data source to the DSL model.
        /// </summary>
        /// <param name="modelRoot">The root element of the model.</param>
        public void DataBind(ModelElement modelRoot)
        {
            WinFormsDataBindingHelper.PreInitializeDataSources(this);
            this.pipeLineBindingSource.DataSource = modelRoot;
            WinFormsDataBindingHelper.InitializeDataSources(this);
        }
    }
}
```

Figure 4 : Object Binder

The user interface or application model in figure 5 is the layer that enables stakeholders' interaction with the system. As far as experts could see through to a design scenario, the system will be able to capture it and evolve a design that meets their needs. The user could make some input through guided notations from the interface, and the system can then match these inputs with a parsing grammar following internal communication among the application model, the domain model and the translator.

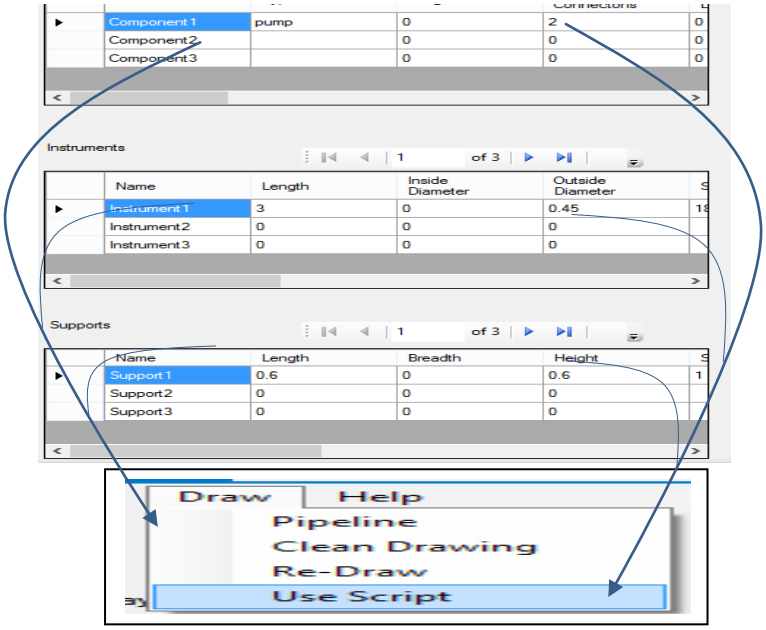

Figure 5 : Modelling Action with User Interface

VIII. Conclusion and Future Work

A modelling idea based on domain specific modelling is presented with the intention of highlighting the essential components of pipelines designed to transport oil and gas from source to destination. We utilized this domain specific modelling philosophy as a framework for designing a domain specific language for

modelling transmission pipeline designs. The language has the expressive capability to model pipeline designs at abstract and concrete levels of specification. This language has a number of features such as application model with familiar notations that allows flexible development and specification. However, the significance of constructing this new language is lack of tool support and modeling for the purpose of tackling complexities associated with computer aided design systems and general purpose programming language platforms for modelling engineering designs such s transmission pipeline systems. To provide support for the language, we tested the implementation of the application model through a text template transformation of the domain model of the language metamodel. The testing of the language tool was based on the .Net platform for domain specific software development. In the future the focus will be on the strategies for implementation of the integration of the editor and the grammar, which will lead to the actual writing of virtual pipelines.

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The Study of Fraud Detection infinancial and Credit institutions with Realdata

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Abstract- This paper presents a review of data mining techniques for the fraud detection. Development of information systems such as data due to it has become a source of important organizations. Method and techniques are required for efficient access to data, sharing the data, extracting information from data and using this information. In recent years, data mining technology is an important method that it has changed to extract concepts from the data set. Scientific data mining and business intelligence technology is as a valuable and some what hidden to provide large volumes of data. This research studies using service analyzes software annual transactions related to 20000 account number of financial institutions in the country.The main data mining techniques used for financial fraud detection (FFD) are logistic models, neural networks and decision trees, all of which provide primarysolutions to the problems inherent in the detection and classification of fraudulent data. The proposed method is clustering clients based on client type. An appropriate rule for each cluster is determined by the behavior of group members in case of deviation from specified behavior will be known among suspected cases. The rules of the C5 have been applied in decision tree algorithm. Model is able to extract about a lot of the rules related to client behavior.

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Keywords : *datamining,fraud detection, financialfraud, clustering, classification.*

I. Introduction

Data has become one of important organizations with the development of information systems. The methods and techniques are required for efficient data access, data sharing, data extraction and use of this information. There are many alternative approaches to fraud detection and deterrence (Brockettet al., 2002). Bolton and Hand (2002) discuss techniques used in several subgroups within fraud detection such as credit card and telecommunications, and related domains such as money laundering and intrusion detection. Kou et al (2004) outline techniques from credit card, telecommunications, and intrusion detection. Weather ford (2002) recommends back propagation neural networks, recurrent neural networks and artificial immune systems for fraud detection. Maes et al., (1993) is an example of straight forward application of existing data mining algorithms to an "ideal" data set: it uses neural networks for credit card fraud detection data. The neural network is a technique that imitatesthe functionality of the human brain using a set of interconnected vertices (Yeh and Lien, 2008; Ghosh and Reilly, 1994). It is widely applied in classification and clustering, and its advantages are as follows. First, it is adaptive; second, it can generate robust models; and third, the classification process can be modified if new training weights are set. Neural networks are chiefly applied to credit card, automobile insurance and corporatefraud.

Unfortunately, details about the used features are not given.Currently, identification of fraudulent claims is achieved using a scoring method to implement a claim auditing strategy. In recent years, data mining technology has become as one of the most important concepts extracted from the data set. Because, its technology has provided as scientific intelligence and valuable commercial and it obscured for a large amount of data. Various fields have been identified for data mining applications and developing.Various data mining techniques have been applied in FFD, such as neural networks (Fanning and Cogger, 1998; Dorronsoro et al,1997; Cerullo and Cerullov, 1999;Kirkos et al, 2007), and decision trees [Kirkos et al,2007; Kotsiant is et al, 2006], among others. Data mining techniques covered by survey papers and bibliographies include outlier detection (Hodge and Austin, 2004), skewed/imbalanced/rare classes (Weiss, 2004), sampling (Domingos et al, 2002), cost sensitive learning, stream mining, graph mining (Washio and Motoda, 2003), and scalability (Provost and Kolluri, 1999).

The most common areas can be noted include medical issues, education, production and quality control, retail, and banking and insurance industry as well as marketing and supply chain issues. But one of the applicable the field of data mining is related to client relationship management. Today, there is the high volume of client data in the database and organizations, it is providing the potential for data mining process and hide knowledge extraction. The importance of issues is such as client retention and increase the value and profitability of their companies has rein forced the need to use data mining techniques. The present study is an attempt to analysis of a financial institution and credit

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clients, client hide behavioral patterns detection to improve the process of fraud detection in these institutions have taken advantage of it.Financial institutions area mong the organizations tha t interact directly with clients. Therefore,the analysis of client behavior is important to increase their loyalty. In recent years,with increased access to client data and improved data analysis capabilities by intelligent methods, various activities have been carried outto analyze client behavior. One of these activities is the use of intelligent systems for detecting fraud infinancial institutions. Currently fraud is wide range in financial institutions that have been material and immaterial losses many financial institutions and bank clients.

a) Fraud

Fraud involves one or more persons who intentionally act secretly to deprive another of something of value, for their own benefit. Fraud is as old as humanity itself and can take an unlimited variety of different forms. However, in recent years, the development of new technologies has also provided further ways in which criminals may commit fraud (Bolton and Hand, 2002). This approach (fraud detection) makes useof an "operations cycle" and a "development cycle" to detect fraud in health care claims. First, a Peer Group Analysis variant is used to find health care providers which "stand out from the main stream", which are then presented to a security unit. In the development cycle, rules should be induced based on the expert analysis of the outliers. As in (Kim et al., 2003), these rules are proposed to be cloned and mutated. Details about the development cycle process are not given.In this study,it has tried first;full explanation of the types of fraud was common infinancial institutions, in general and money laundering in particular, and intelligent data mining system to be expressed in the following manner. Fraud from different views is visible, including views of the social, legal, and economic.Fraud in Czech, business, loan and money laundering is instances of fraudin the financial context that our focus is on money laundering (a special type of fraudin the bank with the aim of hiding the true source of money).

There are different definitions for internal fraud, including:

- acts to deceive, exploit or circumvent the law and regulations, with the exception of special events (The Basel Committee on banking supervision, 2006)
- Use of jobs for personal enrichment, intentional abuse or misuse of the resources and assets of the organization (Association of Certified Fraud Examiners, 2008)

According to the Association of FraudExaminers expert, to 959 cases of occupational Fraudas follows: (Association of Certified Fraud Examiners, 2008) organizations in the United States lose to fraudabout 7% of its annual revenue. Analysis of an average of $ 175,000, which lost a quarter of these cases for amounts less than $ 1 million. Instance of fraudsince the beginning of fraudulent behavior to it diagnosis took 2 years.The most common is fraud scheme corruption, fraudulent billing Fraud 27% and 24%, respectively. It seems that the implementation of anti-fraud controls can be largely effective, and etc…

For reasons that are mentioned in the client' employeedriver scould potentially becommitting fraud. (Luell, 2005)

Over the past two decades, the competitive land scape has changedsignificantlyin the banking industry. This is due to factors such asnew regulations, globalization, technology development and product service in to the bank and a significant increase indemand of our clients. Changes in banking activities and the increasing complexity of existing rules in banks are created new topics in the field of bank fraud. Major and Riedinger (2002) describe a workflow and system to setup fraud detection departments with results of its use in the real world. Similar work was done by Ortega et al. (2006), who introduced a data mining based system that decreased the time it takes to detect fraud by 76% from an average of 8.6 months to 2 months. Because Major and Riedinger and Ortega et al., describe real systems that are used to find fraud they cannot go into details of the exact working of the systems. Doing this would give fraud perpetrators an advantage on penetrating the fraud defense.

Fraud detection techniques, in addition to fraud and scams in which an organization has identified and provides analysis ,to some how try to predict the future behavior of their users or clients to will decrease the risk of fraud.

Due to high costs caused by direct or indirect fraud or fraud in financial institutions, banks, financial institutions and money to crooks and fraudsters are aggressively seeking to expedite the recognition activities. The importance of this is due to its direct impact on client service organizations to reduce operating costs and remain as a credible and reliable provider of financial services.

a) Research hypotheses

The main hypothesis of this research is development of data mining combined with pattern matching techniques to construct a scenario with practical and valuable solutions and complete fraud detection system available. Data mining anddata mining algorithms is appropriate to predict large data database.

- Classification, is learning function that categories a data item into one of several classes of predefined (for example, a client classified as "cheaters" or "non-cheaters")

- regression, is learning function that a data item is classified into a true predict (e.g forecast of fraud by a client)
- clustering, is a description that seeks to identify a finite set of categories or clusters are used to data describe. (For example, identify target groups of clients)
- Dependency modeling, is focusing on describing the dependencies and relationships between data (for example, find ways unknown to cheat clients)
- a change and deviation, detection in the identify of data significant changes, with a focus on values, principles or the previous measurement. (For example, find ways to unusual usage patterns of clients Institute for fraud detection)
- Decision tree, which is a powerful tool for prediction and classification a similar structure tree.

II. Materials and Methods

The study is based on data collected has been one of the country's financial and credit institutions and the purpose of this proposal predictable patterns of fraud and to prevent fraud by institution profiteer clients. The study is one of the financial institutions includes transactions on accounts of clients, legal and real. Studied data collected from about 20 thousandsclient accounts during the one-year period, of which about 25 million records are for a variety of clients. So thatclients is divided in three groups of clients, legal client and government and non-government agencies related companies as well as actual clients that is the clients majority of financial institutions.

a) Methods

1) The first, study of account behavior should be specified normal behavior procedure for each account.
2) Due to the large number of account numbers, account individual behavior is not true in this case; it should be defined for each account a certain procedure.
3) It can not specify a fixed behavior pattern for each account. Because it is possible for a client's behavior is a normal behavior and abnormal behavior lead to a different account. For example, you may with draw or deposit the amount of 150 million dollars for a client's normal behavior, but the behavior of a group of clients whousually have low amounts transactions ,are considered to be suspicious behavior.
4) So, data clustering should have been used and data clustered to close together in a cluster to take account behavior.

The study data were based on the type of client clustering, so each cluster represent inga certain type of client, the procedure will havea different behavior. In this study, to determine cases of fraud requires a Boolean data typeas “fraud anticipate " would be the initial value will be equal to 0. If exceed behavior of an account from the normal rang, the value of this field will change to 1. This will be implies for abnormal behavior(suspicious behavior) (figuer3.1).

To predict of fraud using adecision tree used of input data including the type of client,the number of deposit transactions, the total deposit transactions, the number of with draw transactions, the total with draw transaction. In this study, 30 percent of data is used as training data and 70 percent of data as the test data.

Decision tree operator used to fraud predict of test data. This function builds a model based on the training data set and the model of is build predicts attribute toespeciallytarget of test data where it is lacking this amount.

Toolsused in thisresearchare:

1. SqlServer 2012
2. AnalysisService2012
3. Excel2012
4. Data Mining tool has been added to Excel software

Various methods have been used to predict Fraud. One of these methods, the use of neural network is more efficient than other algorithms. This algorith m model learns using neural network trained by error back-propagation algorithm. Architecture of this type of artificial neural network is called multi-layer Perceptr on. The foundation of operator is such a multiple layers considered for it.Construct the inner layer neural network can be defined with the help of Hidden Layers parameter list. Each entry in this list defines a new hidden layer. If the user does not specify any hidden layers it will be added to the network by default a hidden layer. Most fraud departments place monetary value on predictions to maximize cost savings/profit and according to their policies. They can either define explicit cost (Chan et al, 1999) or benefit models.Cahill et al (2002) suggests giving a score for an instance (phone call) by determining the similarity of it to known fraud examples (fraud styles) divided by the dissimilarity of it to known legal examples (legitmate telecommunications account).

III. Results

a) The results of the decision tree

Decision Trees is one of the most powerful tools common to classify and predict. In this section the results of the model based on decision tree algorithm reviewed.In Figure 1-4 likelihood of fraudis shown based on entire of statistical population in used model of decision tree.

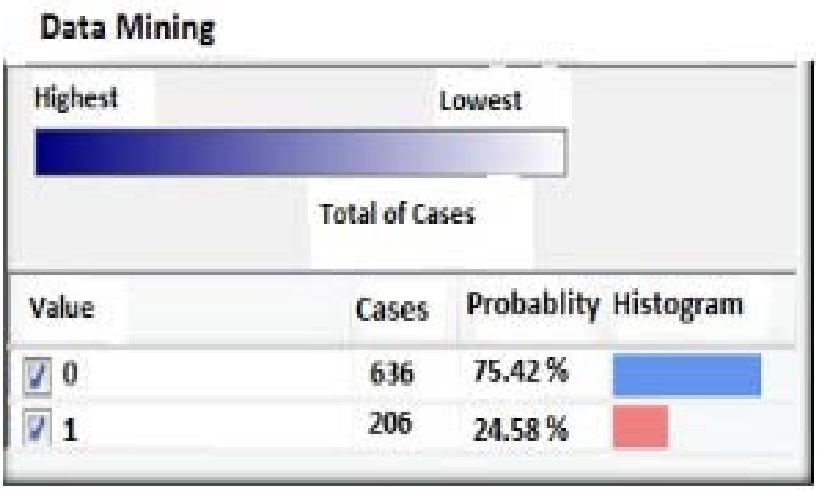

Figure 1 : Possibility of fraud in entire of statistical population

It can be identify fraud probability studied based on type of client in Figure 1. In a survey conducted by the type of client fraud took place is shown in Table 1. According to Table 1in the type of special clients are most likely to fraud and so on based on the legal and real clients will be less likely to fraud. High probability of fraud among clients is due to transactions and amounts of high for this type of clients.

Table 1 : Fraud probability based on client in decision tree

Type ofClients	Fraud Probability (percent)
Special	62.5
Legal	44.85
Real	11.44

Case studies are checked for each node and each branch:

1. there are 62.5% of fraud probability for special clients on the basis of the proposed legislation that it will different according to the amount of the withdraw transaction.

A. fraud probability will be approximately 62.27%, If the number of transactions is equal to 365.

B. If the number of transactions take less or more than 365 transactions, it is likely to reach 73.75%.

2. There are 44.85% of fraud probability for legalclients on the basis of the proposed legislation that it will different according to the amount of the withdraw transaction

A. Fraud probability will be approximately 97%, If the number of transactions is equal to 2920.

B. If the number of transactions take less or more than 2920 transactions, it is likely to reach 44.72%.

3. Thereis 11.44% of fraud probabilityfor realclients on the basis of the proposed legislation that it will different according to the amount of the total ofdeposit transaction.

A. Fraudpossibility is very low, about 0.4 percent, If the total of deposit transaction is less than 414359160 RiallRR.

B. Fraud probability will be 19.84%, If the sum of deposit transaction is less than 569946764 Rial IRR or 414359160 Rials IRR is greater than or equal.

C. Fraud probability will be 69.72%, If the sum of deposit transaction is more than 569946764 Rial IRR.

Figure 2 : Chart of clients'fraud

It can be observed the effective information in model made to study of made tree network model properly. Network diagram created in the tree is presented at figure 3. Greatest impact on the fraud prediction is related to information of withdraw transaction number, client type and sum of deposit transactions in this model.

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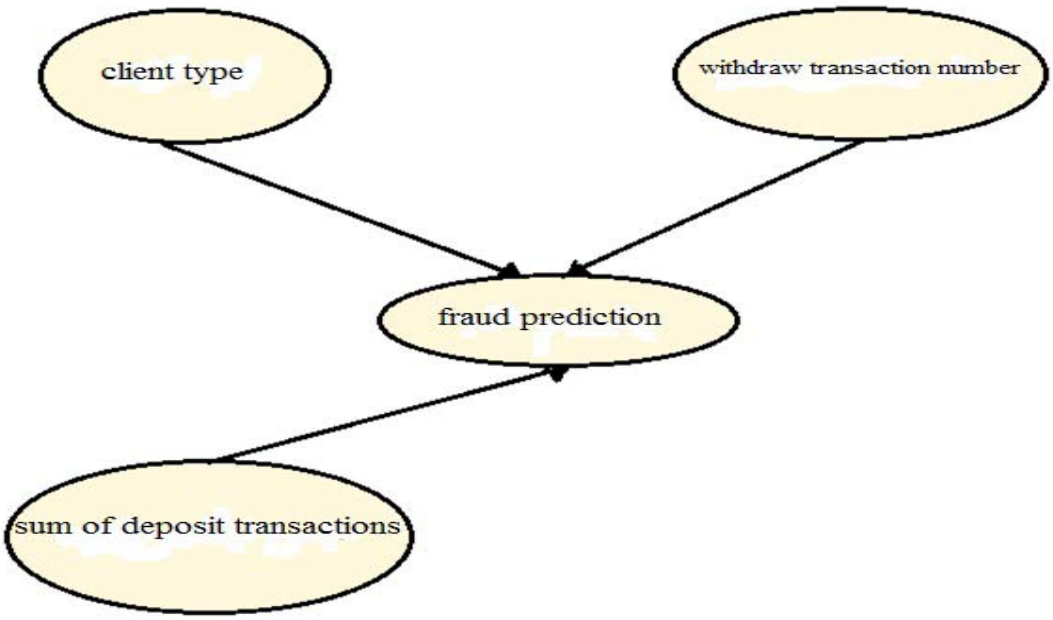

Figure 3 : Diagrams createda network model

The evaluation model is shown in Figure 4. The green line shows in the graph ratio of cheaters population to total of statistical population on the basis of the model (figure 4).As figure 4 shows,possibility of frauds person will be increased with increasing of institution clients'population, as well as, the amount of fraud will be increased in the institutions, accordingly.

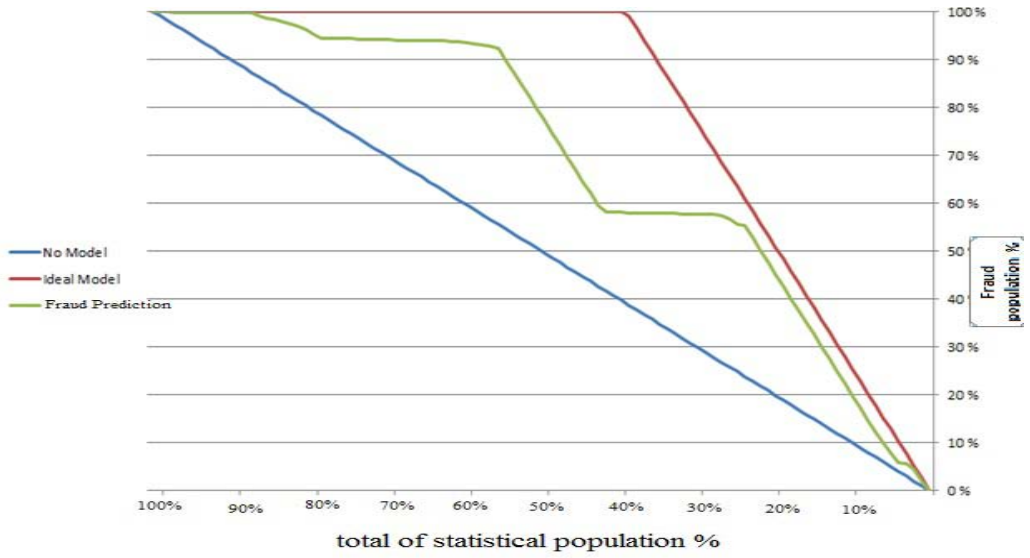

Figure 4 : Ratio of cheaters population to total of statistical population in decision tree model

As figure 5 shows,red and green colorrepresent legal,real and special clients. In this study, the blue and green colors have been allocated the highest and the lowest rate among the total of clients population.

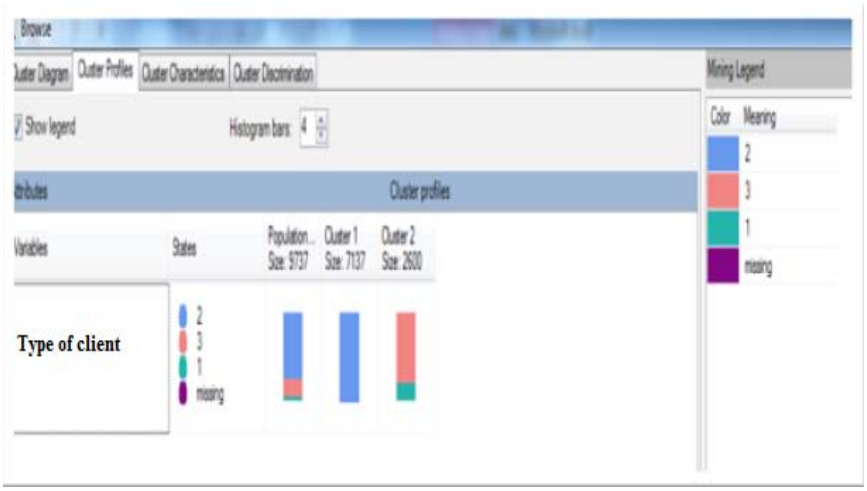

Figure 5 : The total of used population inmodeling

b) The results of the modelbased on neural network

In this section, the applications of neural network have been investigated using Neural Network Algorithm to fraud predict. input data is including the type ofclient,the number of deposit transactions, the total of deposit transactions, the number of with draw transactions, the total of withdraw transaction. Created model is evaluated based on Neural Network operator. As figure 6-4 shows, number of fraudsters will be increase with increasing of total of statistical population. However, the ratio of fraudsters' population to total of statistical population is less comparison with the decision tree model. Breakpoints is much lower In this model (neural network) than decision tree model Which indicates that growth of fraudulent population based on neural network moves a lower slope than the model based on decision tree.

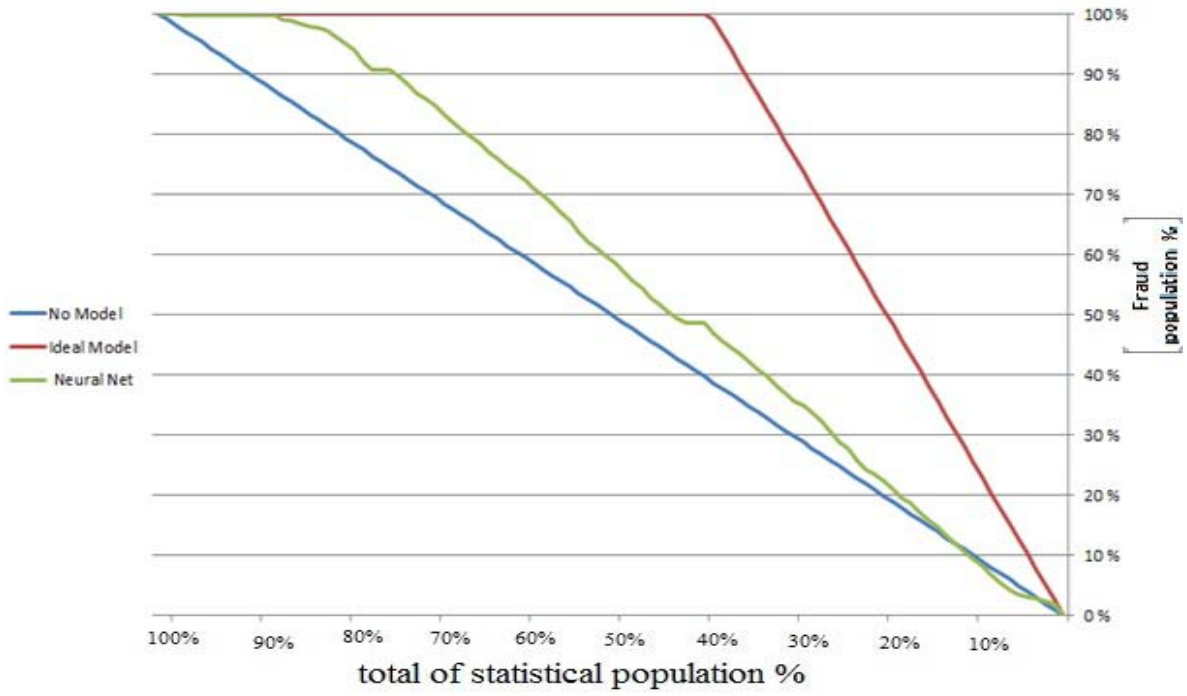

Figure 6 : Fraudulent population ratio to total of population in the neural network model

input data is including the type of client,the number of deposit transactions, the total of deposit transactions, the number of with draw transactions, the total of withdraw transaction. Chart created is shown by label classes as fraudor none-fraud,in Figure7.Figure7 shows redandblue diagram represents thefraud and none-fraud ,basis of input data, respectively.as Figure7 shows,sum and number of deposit transactions have more effective at predicting of fraud.

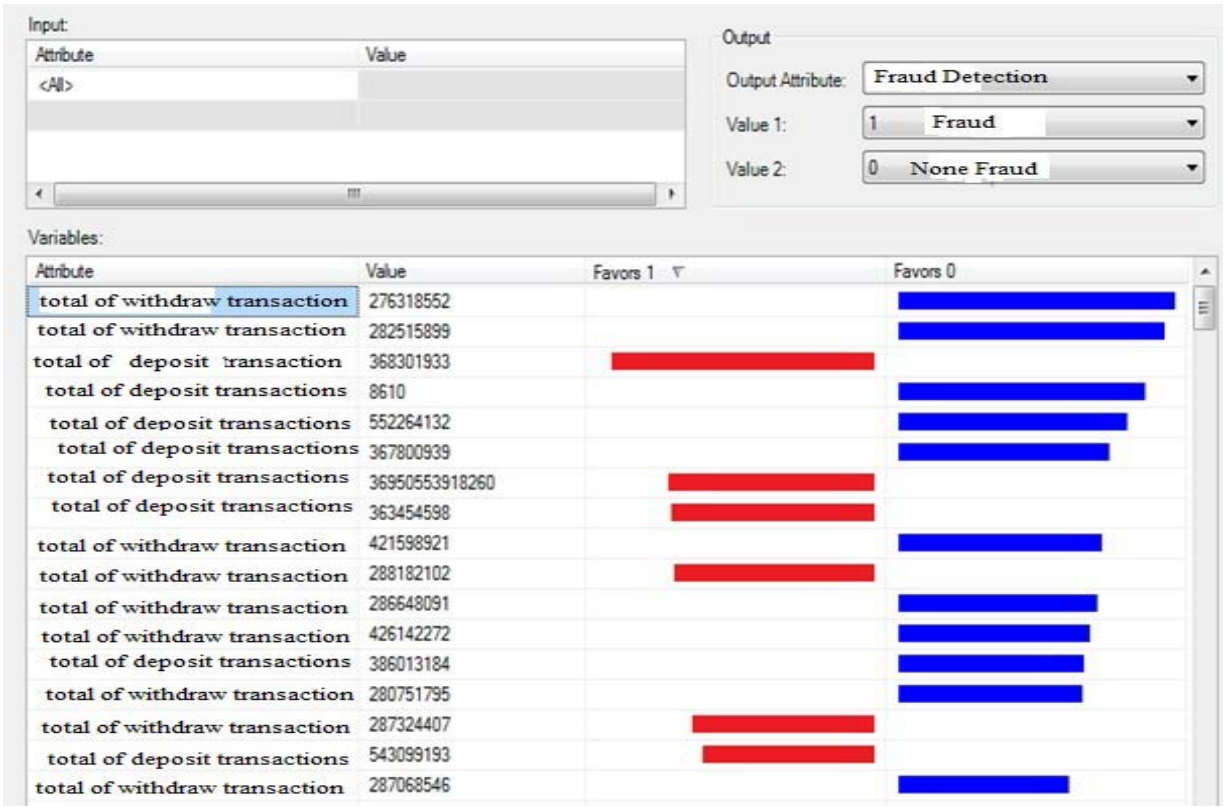

Figure 7 : Chartcreated by classeslabelfor neural network model

IV. Conclusion

Details of transactions is an important source related to the 20,000 financial institution clients account number that it is an important source for data mining. Because, very high volume of information are related to transactions of client's account that represents their behavior and source of high information is dynamic. One of the main problems of financial and credit institutions by extending the jobber clients, increased behavioral diversity and the loss of financial resources and it will be reduce institute consumer confidence. Therefore, terrorist actions of some jobber clients should have been identified and possibly to submit proposals to prevent a fall in the confidence of clients and increased the security of the financial institutions. Inthis study suggest that the use of decision trees because the goal is to predict consumer fraudand financial institutions, after mining the type of anticipation. Modelbased on decision tree algorithm better, it has higher accuracy and speed than neural network. When the decision tree due to prune the tree after the tree branches that the risk of fraud is minimal, they will be removed.This method makes it easier to evaluate the model. Missing data very little in model created in detail of transactions on client accounts, but the accumulation of information and the use of CIF s data preparation phase is very important. If the predictive of fraud is respect to client account transactions behavior it should be based on the type of client, transactions are aggregated. After this stage, the aggregated data should be normalized. Because there is no specific measure to analyze the obtained data are very hard, but if the data has a high or low level that they are better understood. Therefore,data should be normalized. One of the benefits of the details of transactions on client accounts too ther clients of the financial institution and credit characteristics, including characteristics such as age, place of residence, education, address, etc. The data mining techniques of outlier detection and visualization have seen only limited use. The lack of research on the application of outlier detection techniques to FFD may be due to the difficulty of detecting outliers. Indeed, Agyemang et al. (2006)point out that outlier detection is a very complex task a kin to finding a needle in a hay stack. Distinct from other data mining techniques, out lierdetection techniques are dedicated to finding rare patterns associated with very few data objects. In thefield of FFD, outlier detection is highly suitable for distinguishing fraudulent data from authentic data, and thus deserves more investigation. Fanning and Cogger (1998) highlight the challenge of obtaining fraudulent financial statements, and note that this creates enormous obstacles in FFD research.it is concluded that its attention towardfinding more practical principles and solutions for practitioners to help them to design, develop, and implement data mining and business intelligence systems that can be applied to FFD.The data is quite dynamic, and the data revealed, if the behavior of client changes the above-mentioned. Data normalization is better after aggregation of information on the different patterns of clients' behavior. In this study,it concluded that the possibility of fraud was high for many special clients and it may have transport with different way so such as dirty money through the financial institution, and legal clients through the creation of fictitious institution want to make money launde ring that registration of the company or institution should be considered very care fully to prevent such acts. Conclusions are as follows:

1) The presence of special clients in each institutionwill benefittoinstitutionsand it is very useful to riseof institutere sources. On the other hand,based on the results, the possibility of fraudis more among clients.There fore, more focusis needed to uncover cases of fraud this group of clients.
2) Measures should be considered in addition trust of legal clients, transactions of these clients more control, as well as the delivery of documents when opening an account for legal clients more controlin order to reduce the amount of fraud of group of clients.
3) Measures should beconsidered to determine actual client behavior groups. In this case the behavior of a client can be more easily analyz e dandidentified suspicious.

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We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The FARSC can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSC, you will be given a renowned, secure and free professional email address with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders, Auto-Responders, Email Delivery Route tracing, etc.

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The FARSC member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSC, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.

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The “MARSC” is a dignified ornament which is accorded to a person’s name viz. Dr. John E. Hall, Ph.D., MARSC or William Walldroff, M.S., MARSC.

MARSC accrediting is an honor. It authenticates your research activities. After becoming MARSC, you can add 'MARSC' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

The following benefitscan be availed by you only for next three years from the date of certification.

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We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSC member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSC, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA)-OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

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The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

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After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

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- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

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- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

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The Area or field of specialization may or may not be of any category as mentioned in 'Scope of Journal' menu of the GlobalJournals.org website. There are 37 Research Journal categorized with Six parental Journals GJCST, GJMR, GJRE, GJMBR, GJSFR, GJHSS. For Authors should prefer the mentioned categories. There are three widely used systems UDC, DDC and LCC. The details are available as 'Knowledge Abstract' at Home page. The major advantage of this coding is that, the research work will be exposed to and shared with all over the world as we are being abstracted and indexed worldwide.

The paper should be in proper format. The format can be downloaded from first page of 'Author Guideline' Menu. The Author is expected to follow the general rules as mentioned in this menu. The paper should be written in MS-Word Format (*.DOC,*.DOCX).

The Author can submit the paper either online or offline. The authors should prefer online submission.Online Submission: There are three ways to submit your paper:

(A) (I) First, register yourself using top right corner of Home page then Login. If you are already registered, then login using your username and password.

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1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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2) Drafting the paper and revising it critically regarding important academic content.

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All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

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Complete support for both authors and co-author is provided.

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Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications.

Research letters: The letters are small and concise comments on previously published matters.

5. STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

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(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

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It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

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Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

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A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

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Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

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- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

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Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

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5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

8. Use the Internet for help: An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

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.

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.

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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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