DATASET FOR AMERICAN SIGN LANGUAGE

Aliya Gohar, Mrs. Shazia Saqib, Rabia Shakeel, Rimsha Naheed

Abstract: - For the deaf and dumb people, sign languages are the only path of communication. With the help of sign languages, physically disabled people can convey their feelings, emotions, and thoughts to other people. Since, for the common person, it is very complicated to understand these languages, these physically disabled persons are dependent on a, who interacts with the world to convey their thoughts and feelings. For the production of these sign languages, it was necessary to develop an efficient dataset. With 26 English alphabetical hand gesture images. Further, segmentation and classification are applied to datasets. This paper provides guidelines for the creation and selection of datasets.

Keywords: Datasets, hand gestures recognition, ASL, HCI and Feature Extraction

1. INTRODUCTION

Sign languages are the native languages for the deaf and dumb communities worldwide. The deaf community ratio is in minority in their world whereas dumb community is the majority in ratio. These two communities typically have any signing skills, there is an interest to build a communication path for both the communities. In sign language recognition, an automatic system extracts sign language from an image or video and represents sign in a written form, which then translated into a written text of a spoken language. Drawing on the emerging in the computer vision the simple method is found to be the most robust one when tested on large datasets. We have chosen to use datasets to describe a collection of images used by researchers in some domain. The image dataset is based on American Sign Languages hand gestures. Although there are many hand gestures datasets available, there are some characteristics that differentiate our work from other datasets. Firstly, the images cover a variety of hand gestures using different illumination conditions. Secondly, the images are cropped and segmented from the original captured images, allowing researchers to test their own combinations of feature extraction method, (e.g. edge detection and
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binary images.). Thirdly publically-available datasets for hand gestures may be used, there is no need to use any special gloves or any other equipment while recording these gestures. In the data collection, the wrist cover was only used to improve the quality of the color segmentation but does not mean that wrist cover is considered to be compulsory for the development of recognition algorithm.

Table 1: Publically Available Data Sets

<table>
<thead>
<tr>
<th>Description</th>
<th>URL</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various Hand and Gesture Datasets</td>
<td><a href="http://www.ifp.ch/resource/gestures">www.ifp.ch/resource/gestures</a></td>
<td>[5-8]</td>
</tr>
<tr>
<td>Gesture Recognition Database</td>
<td>www-prima.univ-lpes.fr/psnet/data/12-NeelamGestute</td>
<td>[9]</td>
</tr>
<tr>
<td>BWHBOSTON-104 Database Video</td>
<td>www-isf.informatik.rwth-aachen.de/dress/dataset-vrh-boston-104.php</td>
<td>[13,14]</td>
</tr>
<tr>
<td>Hand image dataset (ASL,rendered)</td>
<td><a href="http://www.cs.uc.edu/groups/sviscs/data.php">http://www.cs.uc.edu/groups/sviscs/data.php</a></td>
<td>[15]</td>
</tr>
</tbody>
</table>

In 2005, a former computer vision research group at IIMS created an image dataset [1]. The latest image dataset was produced containing all standard ASL (American Sign Language) gestures. These datasets have the limited number of gestures and postures, most of these do not have the full image available. The most common datasets are listed in table 1 [1].

Christopher Lee and Yangsheng Xu developed a glove based recognizing a minimal subset of a full sign language that hardly recognized the 14 of the letters from the hand gestures alphabetic datasets [8]. Since from the years, latest glove devices have been designed i.e. power glove, Sayre Glove, and Dexterous Hand Master. The most successful available glove is by far the VPL Data-Glove as represented in a fig.1.

VPL Data Glove was introduced by Zimmermen in the year 1970’s [8]. Kalsh et

Figure 1: Data Gloves

2. LITERATURE REVIEW
specify one of the famous standard datasets for hand postures as hand sign languages [9]. Badi et al express human sign language as one of the convenient and effective communication paths for deaf and dumb people [9]. Sign language is one of the visual languages communicated using facial expressions, hands and arms gestures and using lip signs. Sign language understanding and identifying the process involved in translating these movements and action into meaningful speech and sentences. Sign languages are not global, these languages are region specific giving rise to different forms such as American Sign Language, Indian Sign Languages, Chinese Sign Language, German Sign Language, Argentinian Sign Language. Sen et al specify that all 26 alphabets in English vocabulary can be a unique hand gesture dataset [9]. Recognition process involves extracting the meaningful features from these gestures and interprets the specific meanings and finally generates tone or text message. KTH dataset is a dataset with six actions. These six actions are hand clapping, hand waving, walking, running, jogging, and boxing [9]. These six different actions are executed by 25 subjects in four different environments such as indoor, outdoors with scale variations, outdoors with different clothing and outdoors [9]. A research dataset for action recognition shows a domain at the frontier between action and gestures. Gesture datasets are also moving away from research and new spread to the commercial market. For example, ARB lab has recently been running their company based on a gesture dataset and the related acquisitions software [11]. 3D hand tracking datasets along with hand shapes, movement trajectories are necessary component of signs, orientation, and computer-based recognition pattern for automatic sign recognition [12]. In observation, most of the datasets have been created for internal projects then released publicly. However, datasets carefully and specifically designed for comparison purposes of interest in the research community.

3. MATERIALS AND METHODS
Hand gesture recognition has four essential components i.e. hand detection, hand gestures, hand tracking and hand segmentation [10]. These four components of various processes as hand detection include background subtraction followed by skin segmentation and feature extraction to detect the user’s hand for input. We differentiate three types depending on the problem. We target hand shape recognition, sign recognition and sentence recognition. The methodology of ASL recognition system comprised of stages i.e. Creation of datasets,
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preprocessing, edge detection, feature extraction, gesture modeling and classification [13]. Since, gestures are considered as dynamic in nature that is more complex, but suitable for the real-time environment. Variety of methods has been proposed for acquiring information mandatory for gesture recognition system. A gesture can deliver information which is usually qualified as spatial symbolic information and effective information. The work on the dataset is to identify the symbolic information displayed as hand gestures. The ASL database used for identification consists of 26 English alphabets as shown in fig 2.

Figure 2 Static Alphabets of ASL

a. **Description of Datasets**
To make translator accessible through the simple web-app and a laptop with a camera, color images are selected. 26 English alphabetic images by using different hand gestures that used to create an effective dataset. Images of 1920×2560 dimensions have been selected for the creation of datasets. The hand’s gestures images are cropped with no negative space. For further requirements, segmentation and classification could be applied to these color images. We have mainly focused on the static hand gestures datasets. Here are some multiple images of different gestures used for the creation of the effective datasets.

Figure 3 Multiple Datasets for ASL Gesture A

Figure 4 Multiple Datasets for ASL Gesture B

Table 2 represents the clear on video based research level datasets for recognition [6].
The image database is giving rise to a new and challenging problem for the researchers. Since database technology from past forty years has played a vital role in the production of object-relational databases and relational databases [14]. Our database contains about 120 Images and dimension 1920×2560 composed of American Sign Language. It is necessary to mention here, that large size database provides more efficiency as it increases the recognition percentage. MS SQL is used as a tool server for the creation of the database. Multiple pictures of different gestures are stored in the database. The screenshots of the database are given.

b. **Creation of Database**

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### Table 2: List of Datasets

<table>
<thead>
<tr>
<th>Name</th>
<th>Classes</th>
<th>Subjects</th>
<th>Samples</th>
<th>Language level</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGS Kinect 40 [1]</td>
<td>40</td>
<td>15</td>
<td>3000</td>
<td>Word</td>
<td>Contact Author</td>
</tr>
<tr>
<td>DGS RWTH-Weilhach [6]</td>
<td>1200</td>
<td>9</td>
<td>45700</td>
<td>Sentence</td>
<td>Public Website</td>
</tr>
<tr>
<td>DGS SIGNUX [8]</td>
<td>450</td>
<td>25</td>
<td>33210</td>
<td>Sentence</td>
<td>Contact Author</td>
</tr>
<tr>
<td>GSL 20 [1]</td>
<td>20</td>
<td>6</td>
<td>840</td>
<td>Word</td>
<td>Contact Author</td>
</tr>
<tr>
<td>Boston ASL LV [3]</td>
<td>3300+</td>
<td>6</td>
<td>9800</td>
<td>Word</td>
<td>Public Website</td>
</tr>
<tr>
<td>PSL Kinect 30 [2]</td>
<td>30</td>
<td>1</td>
<td>300</td>
<td>Word</td>
<td>Public Website</td>
</tr>
<tr>
<td>PSL ToF 84 [3]</td>
<td>84</td>
<td>1</td>
<td>1080</td>
<td>Word</td>
<td>Public Website</td>
</tr>
</tbody>
</table>

In general, the datasets that are video-based depend on segmentation and skin color tracking and are therefore not robust for background variations and interpreter cloths as well as hand-hand or hand face occlusions [6]. To store the datasets it is needed to create a database. Here I will represent the Massey’s image database containing a number of hand postures and hand gestures [7].

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### Table 3: Examples of Few Datasets

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Lighting Condition</th>
<th>Background</th>
<th>Size</th>
<th>Number of Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hand gesture</td>
<td>Normal</td>
<td>Dark background</td>
<td>640×480</td>
<td>169</td>
</tr>
<tr>
<td>2 Hand gesture</td>
<td>Normal</td>
<td>RGB(0,0,0)</td>
<td>Varying Clipped</td>
<td>169</td>
</tr>
<tr>
<td>3 Hand palm</td>
<td>Normal</td>
<td>Dark background</td>
<td>640×480</td>
<td>145</td>
</tr>
<tr>
<td>4 Hand palm</td>
<td>Normal</td>
<td>RGB(0,0,0)</td>
<td>Varying Clipped</td>
<td>145</td>
</tr>
<tr>
<td>5 Hand palm</td>
<td>Artificial light/Dark room</td>
<td>Dark background</td>
<td>640×480</td>
<td>498</td>
</tr>
<tr>
<td>6 Hand palm</td>
<td>Artificial light/Dark room</td>
<td>Dark background</td>
<td>Varying Clipped</td>
<td>498</td>
</tr>
</tbody>
</table>

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**Figure 5: The American Sign Language snapshot**
Datasets for American Sign Language

Figure 6: The American Sign Language

below. The snapshot (a) represents the 26 English alphabets stored in the SQL server database and Snap shot (b) represents the stored path of the different hand gestures buying the image URL technique, for the further matching of datasets.

After the successful creation of database, we connected the database on MATLAB for the matching purpose.

4. Complications to hand Gestures Recognition for datasets: Feature Extraction and Extraction Method

Feature extraction is the part of the data reduction process and is followed by feature analysis. The basic and most important is analysis while determining exactly which features are important. The basic objective of feature extraction is to obtain the most discriminating information in the recorded images. The visual cues that are most commonly used are color, shape, texture, motion in video and spatial information. For example, color may represent the color information in an image, such as color binary sets or color coherent vector color histogram. Then parts of the feature may be obtained from one of cue or from the number of cues i.e. the merger of color and texture [2]. The hand gesture images are successfully examined from three stages i.e. preprocessing, **feature extraction** and classification.

![Figure 7. Gesture Recognition Steps](image)

a. Pre-processing:

In the **pre-processing** stage, some operations are applied to extract the hand gestures from to background and formulate the hand gestures for feature extraction.
The process starts with filtering noise, followed by an image adjustment segmentation, thresholding, edge detection, histogram equalization and normalization which have proved to be the good structure of image processing [4].

b. Segmentation

Segmentation is the first stage of recognition process in which acquired images are broken down into expressive segments. The main working of the segmentation process is a division of the image without considering region represents. If the binary images are chosen, only two regions exist, foreground region and background region [2]. For example, when a natural scene is segmented, a region of cloud, mountain, flowers, and the tree may exist [3]. Segmentation should be stopped when the object of interest in an application is isolated [5].

c. Thresholding:

There are many methods of feature extraction. Feature extraction step is usually followed by the classification method that uses the extracted feature vectors to classify the gesture image into the respective classes [2]. Only feature invariants are given as an example of feature extraction used with the dataset. A simple image segmentation problem occurs when an image contains an object that has homogenous intensity and background with different intensity levels [2]. While using feature extraction, hands should be perfectly segmented with a simple color filter. When the environment changed, the image character will change along with the environment. It is harder to detect the image. Especially, when posture or shooting angle change, it will affect the image detection eventually. Therefore, there is need to search for a particular character, that is fixed structure feature posture. Especially when shooting angle varies, and use those features to detect the human hand.

To implement this method the researchers started to examine the image feature that does not change the environment. If the researcher found that skin color is a feature that does not change the environment after the experiment, after that it can be used. Different lighting conditions with skin color may affect the accuracy of hand detection. However, if the chosen image size is big, we can locate the smaller color space inside the skin color and will be able to make image detection simple and easy.

d. Gesture Classification

This process is used to recognize the hand gestures. The recognition process is affected by proper selection of features parameters and suitable algorithms. For example, edge detection or contour
operator cannot be used for hand gesture recognition; many hand gestures were generated before and could produce misclassification. Statistical tools are used for gesture classification and HHM has shown its ability regarding dynamic gestures.

![Hand gestures diagram](image)

**Figure 8: Gestures Classification**

5. DEFINED CLASSES AND DISCRIMINATION BETWEEN ASL GESTURES:

In a study, there are 36 classes of datasets. However, depending on the extraction used, there are some similar gestures and postures difficult to classify. For example, the dissimilarity between “M” and “N” is the thumb appearing not between the fingers. Many simple feature extraction methods will not easily identify the difference between them. Other examples are “V”, “S” against “T” and “K” in the opposition of “2” and “I” against “J” etc. It is observed that some gestures are identical “O” (letter O) and “0” (digit 0).

The decision to coalesce classes does not have least impact on feature extraction and image acquisition method. For example, for a rotation invariant method “I” and “J” are too similar. However, for non-invariant features, they might belong to distinguish classes. Two ASL gestures “J” and “Z” would be dynamic in their original state. In order to standardized datasets, only the movements are not considered. Instead, we slightly rotated the gesture to create dissimilarity from one and other gestures. One can find many changes of ASL gestures alphabetic digits and letters [1].

Similar hand gestures datasets Table

<table>
<thead>
<tr>
<th>Similarity Gestures Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identical</td>
</tr>
<tr>
<td>Of thumb</td>
</tr>
<tr>
<td>Very Similar</td>
</tr>
<tr>
<td>Different angles</td>
</tr>
<tr>
<td>Different angles (J is dynamic in ASL)</td>
</tr>
</tbody>
</table>

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8
CONCLUSION
This paper concludes is about datasets based on American Sign Language in the form of static gestures. Multiple camera input pictures are used to create an effective dataset. These datasets contain only the 26 alphabetic hand gestures. These datasets are based on a single Sign language, it is needed to focus on many other languages such as Urdu Sign Languages for Urdu Speaking country, Arabic Sign Language for Arabic people, French Sign Languages and so on. We have only mapped the American Sign Language based on 26 English alphabetic characters and 0-9 digit based gestures to represents the similarity between these gestures.
REFERENCES:


AN OVERVIEW ON HUAWEI MANAGEONE SERVICES

Shan-e-zahra, Sabir Abbas

Abstract: Huawei ManageOne is a server farm administrative arrangement design for disentangled administration and dexterous operations. It bounds administration of different server and gives integrated end-to-end management solutions for incremented operations and managerial services and overall performance of data centers. ManageOne provides different efficient network services as discussed in this paper.

Keywords: cloud computing, ManageOne services, Huawei network.

1. INTRODUCTION

The ManageOne includes two components: service center and operation center. The service center is responsible for the service provisioning. The operation center is responsible for maintenance and monitoring. The IaaS resource pool is provided by FusionSphere OpenStack and supports the VRM and VMware. In multi-open stack scenarios, only one Key Stone is supported. BC&DR products in the disaster recovery solution provide backup and disaster recovery services for VMs. The backup services support only disk backup. The disaster recovery services support VM disaster recovery, and is applied for online and provisioned manually. The fusion insight resource pool provides big data services, including

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1,2 Lahore Garrison University
HDFS, Hbase, Spark, Hive, and MapReduce. These services are automatically provisioned [1].

The ManageOne includes two components: service center and operation center. The service center is responsible for service provisioning. The operation center is responsible for maintenance and monitoring. The eSight monitors physical devices in DCs. The OpenStack, OM, VRM, and VMware monitor virtual devices in DCs. The OperationCenter summarizes monitoring information about physical and virtual devices, and provides unified views. The Fusion Insight resource pool provides big data services.

2. MANAGE ONE SERVICES

2.1 VPC (Virtual private cloud)

VPC provides a logical isolated network architecture that enables users to use VMs in a user-defined virtual network. You can totally control your own virtual network environment, including setting IP address, creating networks, and configuring security policies. It easily defines the network configuration of VPCs. For instance, a directed system for getting Internet web server and back-end frameworks, are the example of database or application servers. You can also use the access control list (ACL) to manage VM access on each network. Arrange source organize address interpretation (SNAT) for VMs on the steered system to empower them to get to the Internet [2].

a. VPC Functions

Use the ACL to control network access. Use the application specific packet filtering (ASPF) function to filter application-layer packets. Allocate multiple IP addresses for the VMs in the VPC and enable them to connect to multiple defined networks. Configure one or multiple Amazon elastic IP address to be reachable to a VM in the VPC so, this VM might be accessible from the Internet. Signing in to VMs effortlessly utilizing VNC, similarly as they are running in infrastructure. Empower SNAT for systems in the VPC with the goal that your VMs can get to the Internet whenever. Utilize IPSec VPN to interface the VPC and the infrastructure. A VPC provides a secure, isolated network environment in a VDC. Customize virtual networks that serve as traditional networks in the VPC and also provide advanced network services, including elastic IP addresses and SNAT to keep up with service deployment requirements.
The mappings between a VPC and Open Stack objects are as follows:
A VDC administrator can create a VPC and security groups in a VDC.
1. A Router, not associated with outer systems, will be synchronously made in Open Stack when you make a VPC.
2. After applying for a switch in a VPC, you can apply for VPNs, firewalls, systems, and subnets. The Subnets can empower the DHCP work [2].

**b. Feature configuration**

1. A VPC corresponds to a Router in Open Stack. The VPC is successfully created, indicating that a Router, not associated with external networks, is created at the underlying layer. If the Router is associated with an external network, the VRF cannot be created on a physical switch [2].
2. VPCs related with QoS details and it is utilized to confine the inbound and outbound system movement rates. QoS determinations should be designed in Fusion Sphere Open Stack OM.
3. NTP server information configured in a VPC

**2.2 Network Service — Network**

**Internal network:**
Private networks can be made in a VPC[2], for example, Private Net 1, 10.0.0.0/24. It is suggested that private systems in various VPCs don't cover. The private systems in various VPCs cover, correspondence between VPCs is influenced. Private systems have internal systems, e.g. Private Net 1 in VDC 1 and Private Net 1 and Private Net 2 in VDC 2. IP deliver doling out mode to DHCP or Manual when you have to make a network.

**2.3 Routed Network**
Routed network gives VLANs and layer 3 gateways. All routed networks in a VPC can speak with each other. The directed system is utilized to associate with outside systems.

Routers can be created in a VPC and are associated with private networks in the same VPC. After the association is successful, the private networks become routed networks. For example, after Private Net 1 in VDC 1 and Private Net 1 in VDC 2 are associated with Routers in VDC 1 and VDC 2, the two private networks become routed networks [3].

**2.4 Direct Network**

Directed network interfaces VMs straightforwardly to outside systems. The passages and switches of an immediate System change the VDC administration arrange plane.

Switches are related to direct networks, diverse VPCs can speak with each other. External Net 30.0.0.0/24 in the figure is an immediate system. The VM connected in an immediate system can interface with outside systems. IP address can be stuck an immediate system and scrape the IP deliver to a VM port with the goal that can get to the VM from an open system [4].

**2.5 Network Service — Router**

A switch can be utilized to make a routed network. Routed network in a VPC can speak with each other. VMs in a steered system can get to an open system utilizing the flexible IP address and SNAT.
2.6 Network Service — Elastic IP Address

A flexible IP address is an open IP deliver that is bound to a VM on a steered arrange, making administration VMs in a VPC available to outside administrations utilizing settled public IP addresses.

2.7 Network Service — SNAT

Source network address interpretation (SNAT): If an inside IP deliver starts an association with the administrations on people in general system, the passage on the switch or firewall deciphers the private IP address into an open IP address. This procedure is known as SNAT, which applies to access to open systems utilizing shared internal IP addresses [4][5].

2.8 Network Service — Firewall

A physical firewall can be separated into various virtual firewalls. Each logical firewall can work as a free firewall gadget to serve a venture by giving a private system, guaranteeing information security, and augmenting firewall asset use. Virtual firewalls are given by physical or programming firewalls.
2.9 Network Service — IPSec VPN

A VPN is a virtual particular system set up on a public network and is used to transmit private system activity. A physical system can be consistently separated into different secludes systems, this guarantees secure and reliable system association without changing the network [6].

Figure 11. IPSec VPN services

2.10 Network Service — VLB

Load adjusting is a system benefit which disperses movement of various servers running a similar application [7]. The VLB function is implemented using the F5 load balancer.

Figure 12. VLB services

2.11 Network Service — Security Group

A security bunch works as a virtual firewall for cloud hosts to control the inbound and outbound system data and just enables approved messages to pass. VMs in a similar security gathering might be conveyed to different servers and can speak with each other. VMs in various security bunches can't speak with each other as a matter of course. You can arrange a predetermined security gather manage to permit VMs in various security gatherings to speak with each other.
CONCLUSION

Data center virtualization allows multiple virtual machines (VMs) and applications to run on one physical server. This technology decouples the services from IT hardware resources and changes the traditional stove-pipe IT structure in which one application occupies one physical server. The discussed ManageOne services like VPN routed network & others provides efficiency to the users.
4 REFERENCES


Solution of Software Requirement Issues in Software Organizations
Taimoor Hassan, Sara Shahid, Sahira Ahmad

Abstract—A framework is shown in this paper to discuss the issue and solution of software requirements in a software organization. This problem is solved by using a specific framework that based on different steps. Solve the issues of software requirement with the help of this step process and finally, we have a result that is purified from issues. The process is defined as set the purpose and goals, gathering the requirements, engineering the requirement, modeling the requirement, validate or verify the overall requirement in requirement phase, requirement documentation, and management of requirement. The given methodology uses a technique that is specially constructed for the solution of software requirement issues in a software organization. The given approach is based on extracting the information from software requirements and solves their different issues. This approach will very helpful in the organizations that face many problems in software requirements.

Keywords—Software Requirement, Software Organization, Requirement Engineering, Requirement Management, Requirement Issues

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1. INTRODUCTION

The potential of any code is measured by its stretch, responsibility, and reasonability. Needs engineering play an important role in achieving all those qualities [6]. The foremost goal of demand engineering is to realize economical code that is an effectual combination of demand gathering, their study, arrangements, verification & validation and implementation [7]. Code demand work as an associate in nursing initial purpose for any code project and square measure came as a group of rules that should be followed [8]. Demand engineering guarantees excellent and partial needs through the procedure to outline check and to convey backing or facilitate what the client wants. The most goal of demand Engineering is to satisfy those needs that square measure essential for the customers’ wants consistent with the principles and laws. It may be thought of as techniques and capability that a framework should continue [19]. The square measure lots of problems that face by the developers in needs gathering stage. To contend with all of these problems there should be some explicit methodology or set up that demand engineers may take once to finish in needs gathering. Needs engineering seems to be the quality of any project and if demand engineering is solid than the application is going to be profitable.

2. RELATED WORK

Andrea De Lucia and Abdallah Qusef describe the agile methodology that is creating a stir in the community of software development [1]. Techniques of agile are the reaction to traditional ways of developing software. In the implementation of traditional methods, work begins with the elicitation and documentation of a “computer” set of requirements, followed by architectural and high-level design, development and inspection. The industry and technology move too fast, requirements change at rates the swamp traditional methods and customers have become increasingly unable to definitively state their needs up front while, at the same time, expecting more from their software. As a result, several consultants have dependently developed method and practices to respond to the certain change they were experiencing.

Haneen Hijazi, Hashemite University, Jordan Shihadeh Alqrainy, Hasan Muaidi, Doctor of Philosophy Thair Khdour, analysis regarding the various kinds of risk think about computer code development life cycle (SDLC) distinctive and understanding these risks could be a preliminary stage for managing risks with
success [2]. SDLC could be a structure obligatory on the event of a software package, in keeping with this structure the computer code development method involves 5 completely different phases: demand analysis and definition, design, implementation and unit testing, integration and system testing, and also the operation and maintenance section. Within the computer code identification within the method of distinguishing the things that present a threat to the computer code project success.

Ahmad Nauman Ghazi, Kai Petersen, Sri Sai Vijay Raj Reddy, Harini Nekkanti have conducted a survey to elicit their views on problems and improvement strategies [3]. They had identified 24 problems and 65 strategies. Surveys are one of the experimental investigation methods which are used to collect data from a large population. The focus was on questionnaire-based research. The importance of involving multiple researchers in the analysis of survey results was worried.

Kalimullah Khan, P.V.V.Kumar, Azeem Ahmad, Tabassum Riaz, Waheed Anwer, M. Suleman, Omer Ajmal, Tenvir Ali says that the requirements engineering activities act as a backbone of software development[4]. Every year many cases are enrolled against organizations for not fulfilling product requirements properly. The most part of failure product relies upon, either by missing imperative requirements or catching immaterial requirements.

SDLC contains the phases where software creates from scrap to a developed product. Requirements Development Life cycle (RDLC) contains the phases where requirements get started, raised, refined, forcefully changed, implemented and validated. The procedures to gather requirements vary industry to industry.

Alcides Quispe, Maira Marques, Luis Silvestre, Sergio F. Ochoa, Romain Robbes have been distinguished as a key issue that influences the achievement rate of projects in most software design organizations [5]. The software engineering group has considered the requirements engineering practices of medium and large-sized organizations widely and has prepared a fantastic and reasonable solution.

These authors study about the common rules that are followed by the small and large-scale software development companies. They found some key issues that mainly affect the efficiency of an organization similar to lack of knowledge about gathering the requirements but they didn’t provide any solutions to handle these issues.
3. METHODOLOGY

![Diagram: Used Approach]

**a. Set Goals and Objectives**

In this phase, first of all, we set a goal to achieve a relevant result in the shape of solution that is removing the issues of software requirements.

**b. Requirement Gathering**

The Requirements gathering procedure will help in understanding the necessities of a client, particularly in the IT business. Several tools and techniques are utilized by the partners and business examiner to encourage this procedure and catch the correct and point by point requirements.

**c. Requirement Engineering**

Requirement engineering is the process of determining user expectations for a new or modified product.

**d. Requirement Modeling**

It is an structure development arrange within which a model is developed, certified then reviewed as needed till a suitable modeling is refined from that the ultimate application will currently be developed.

**e. Verify and Validate the Requirements**

Verification could be a method of the end that the image and established application totally concentrates on documented needs. Validation is that the method of examining the completeness and correctness of needs.

**f. Document the Requirement**

In this stage, we are going to review all requirements in the requirement document and then finalized it.

**g. Requirement Management**

In this stage, we are going to review all requirements in the requirement document and then finalized it.

4. RESULTS

This section discusses a small case study that is time monitoring software system. This section explains the working on case
study problem and also shows the output of the process.

**a. Set Goals and Objectives**

The first step is ready Goals and Objective. It's thought-about because of the basic stage of needs gathering method. During this stage, the arrangement is to acknowledge original problems that we would like to resolve.

**b. Requirement Gathering**

In the second step of this used framework, requirement gathering from the Time Monitor Software System (TMSS). There are total 27 requirements that is fetch out from Case Study Problem.

**c. Requirement Engineering**

The third and major step is to engineering the requirements in a specific and meaningful manner that is very helpful to develop the overall project. After the irrelevant and incorrect requirements following 16 requirements are cleaned and correct:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>TMSS permission to the software makes to use a www based browser</td>
</tr>
<tr>
<td>R2</td>
<td>In a database store the timestamp records</td>
</tr>
<tr>
<td>R3</td>
<td>To analyze the timestamp records that the permit the manager</td>
</tr>
<tr>
<td>R5</td>
<td>Unique identification</td>
</tr>
<tr>
<td>R9</td>
<td>The week starts on Monday based on current week</td>
</tr>
<tr>
<td>R10</td>
<td>Week ending on Sunday</td>
</tr>
<tr>
<td>R11</td>
<td>Unit task working is defined by manager</td>
</tr>
<tr>
<td>R12</td>
<td>Developer is accountable</td>
</tr>
<tr>
<td>R13</td>
<td>Use the starting and ending dates with the help of schedule</td>
</tr>
<tr>
<td>R15</td>
<td>Manager defines the activities</td>
</tr>
<tr>
<td>R16</td>
<td>Select activities that are representative</td>
</tr>
<tr>
<td>R17</td>
<td>Activities done during record time</td>
</tr>
<tr>
<td>R20</td>
<td>Artifacts, activities are predefined for project</td>
</tr>
<tr>
<td>R21</td>
<td>Stored the artifacts &amp; etc. in database of TMT system</td>
</tr>
<tr>
<td>R22</td>
<td>User configuration of system</td>
</tr>
<tr>
<td>R24</td>
<td>Username, passwords</td>
</tr>
</tbody>
</table>
d. Requirement Modeling

Based on requirements, we develop a requirement model that is showing different requirements and their relationship with one another. In this stage, we use a domain model that shows in the below diagram, this diagram represents the different relations with one requirement to another requirement. After cleaning the requirements, the remaining essential requirements represent in diagram are given below:

\[ R = \{R_1, R_2, R_3, R_5, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{15}, R_{16}, R_{17}, R_{20}, R_{21}, R_{22}, R_{24}\} \]

Figure 2: Cleaned Requirement Model

e. Verify and Validate the Requirements

Verification and Validation are commonly used in the field of software engineering.

There is number of methods that are being used to evaluating the results, but in this scenario, we use the Recall method for evaluate and find out the specific results.

\[ R = \frac{N_{\text{correct}}}{N_{\text{sample}}} \]

In this given formula, \( N_{\text{correct}} \) represent the accurate requirements and \( N_{\text{sample}} \) represent the complete requirements of software/system.

With the help of this formula, we have total 27 sample requirements but after cleaning and removing unnecessary software
requirements we have only 16 requirements that are correct and other 11 are incorrect. Put the values in above formula:

\[ R = \frac{16}{27} \]

\[ R = 0.5926 \]

Validation process plays a great role in the stage of requirements, if we validate, then the chance of errors become very low. The two different ways to represent the validation process during requirements and without the validation process during requirements. The graphs represent the error range from low to high with and without the validation. In these two graphs, it is shown, if we validate the requirements during requirement phase then the chance of errors becomes low. Another case without validating the requirements the chance of errors becomes high and high.

f. Document the Requirements

Requirement document is a document which contains all the requirements of a specific product/project/software. In this document defining how the project will perform different functions and techniques in the light of defined instructions.

g. Requirement Management

As discussed in above chapters, a number of requirements are managing, documentation, collecting, analyzing, capturing, tracing, refining, and prioritizing specific project requirements and then planning for project delivery.

5. CONCLUSION

In this paper, associate degree approach was conferred to deal with the matter of software system necessities that exist in numerous software system organizations. This downside is solved by victimization outlined framework to resolve the problem of software system demand. The conferred approach uses a close framework specifically designed for software system demand problems and detailed analysis of software system necessities specifications. The used framework relies on user
necessities that involve information extracted from existing software system necessities documents and information extracted from completely different parameters. The conferred approach shows that by problems with completely different software system necessities that arise in software system organization and their specific solutions.

6. PROPOSED FUTURE WORK

The future of software system requirement is the main focus of this paper. Variety of researchers that's obtainable to the answer of software system demand problems with totally different aspects. Several consultants still operating to explore the vision of software system demand for well-structured the specification of necessities. With the passage of time, proposed future work is, that mechanically dynamic generation of the need specification with better impact. Embrace their totally different categories, entities, attributes and relationship. That’s terribly useful within the modeling of software system necessities and totally different problems with resolution.

ACKNOWLEDGEMENTS

We would like to thanks my Allah who gave me strength, knowledge, and ability to complete this research paper. Thanks to my supervisor Taimoor Hassan for introducing me to a new topic that is related to software requirements issues and their solution in a different organization. Finally, special thanks to our parents who motivated us with their precious help and support.
7. REFERENCES


ARTIFICIAL INTELLIGENCE AND CYC

Ameer Hamza Khan, Amina Zaheer, Syeda Binish Zahra

Abstract: Since 1984, it is enormous work going on for the accomplishing of the project Cyc (‘Saik’). This work is based on knowledge of “Artificial Intelligence” which is developed by the Cycorp company and by Douglas Lenat at MCC. It’s a Microelectronics and Computer Technology Corporation (MCC) part for so long. The dominant aim of Cycorp to develop this system is to just clarify anything in semantical determination rather than syntactically determination of words commands by the machine in which Cyc is installed to do some job. The other objective was in the building of Cyc is to codify, in a form which is usable by the machine, where knowledge’s millions piece that composes common sense of a normal human or the common sense made in the human brain. Cyc presents a proprietary schema of knowledge representation that utilized first-order relationships. The relationships that presents between first-order logic (FOL) and first-order theory (FOT). After a long time, in 1986, Cyc’s developer (Douglas Lenat) estimate that the total effort required to complete Cyc project would be 250,000 rules and 350 man-years. In 1994, Cyc Project was the reason behind creating independency into Cycorp, in Austin, Texas. As it is a common phrase that "Every tree is a plant" and "Plants die eventually" so that why by the mean of this some knowledge representing pieces which are in the database are like trees and plants like structures. The engine is known as an inference engine, able to draw the obvious results and answer the questions correctly on asking that whether trees die. The Knowledge Base (KB) system, which is included in Cyc, contains more than one million humans like assertions, rules or common-sense ideas. These ideas, rules, and human-defined assertions are describing or formatted in the language known as CycL. They are based on the predication of calculus and many other human-based sciences, which has syntax similar to that of the language “LISP”. Though some extend the work on the Cyc project continues as a “Knowledge Engineering”, which represents some facts about the world, and implementing effective mechanisms which are derived after reaching the basic level conclusion on that knowledge. As Cyc include the first-order logic and first order theory, which exist in some relationship; so it definitely uses and handle some other branches for human-interaction like mathematics, philosophy, and linguistics. However, increasingly, the other aim of Cycorp while developing Cyc is involving an ability, which is given to the Cyc system that it can communicate with end users, by use of
CycL, processing of natural language, and can assist with the knowledge formation process through the machine learning.

### 1. HISTORY

As there is a great problem which is faced by many alignments and company and that’s software’s brittleness and it may be with us after some 50s years. As if a man asks a medical diagnosis, system about his health and about some disease with which he/she is suffering or was suffered in past the machine probably not able to answer your questions accurately even if that system is world class diagnostic expert. Or a car loan system may grant a person for a car loan when he/she entered about job that he/she has 19 years of job experience at the current job even he/she have a date of birth of 1989. So for handling these kind of miserable software’s problem, the project Cyc was introduced in Austin, Texas from 1984 by Doug Lenat at MCC, which is a project of Artificial Intelligence, proposing and making this project to enable a computer or a machine to process natural language for example after the completion a machine will become hear, accept, understand human natural language, and give human-like reasoning which will become the most advance part of human-computer interaction, which is using the method or rules of Microelectronics and computer technology, the first and one of the largest computer industry research and development consortia (the combination of two organizations or companies). The name "Cyc" is a registered trademark owned by Cycorp. As it is a smaller version of the knowledge base but the originally knowledge-base is proprietary by Cycorp to Cyc, which is used to establish a common vocabulary for the purpose of automatic human-like reasoning. Cyc or prelease OpenCyc under an open source license, and recently Cyc system is being made available to AI researchers under a research purpose as ResearchCyc. And it is used in many applications only because of the publishing it in the open sources.

### 2. INTRODUCTION

Today, we have an impressive amount of data to which we interact with and which we use to solve the world’s most Challenging problems around us, but what happened when our data is reached to considerable size, unhandled, this stage make the data scientist, traditional analytics and neural artificial intelligence experts worried. This is a project made in the field of Artificial intelligence which is
made for reading, interpreting, understanding, and giving some suitable output to end-user. So, at this point, human began to think how do we understand data? And how do we translate it into meaningful action? This project is a lot of worth; also it is the next step in the increment of human-man interaction (HMI). After the accomplishing of this project no user has to even touch a machine in future or interact with controls like buttons, joy or giro sticks it’s a simple mechanism of talking with a machine to operate it in more efficient manner. MCC doing a lot of work regards to Cyc and also release some of its modules to researchers and to user so that they get some useful work from it and also to enhance it in some manners. The above mentioned-questions are the study since 30 years. From 1981 a small group of computer scientists began to start working on the shared vision and building an intelligent system that uses real-world knowledge and understand and interpreting that for human-like reasoning, so after the millions of dollars and millions of Ph.D. hours, that vision is fully realized. Meet “CYC”, Cyc is the artificially intelligent system enterprise which provides human-like understanding and reasoning to some complex systems and calculates depth, speed and scalability to human taught which is the world’s first largest, and smartest knowledge-based system by applying intelligent reasoning and common sense to data acknowledge. Cyc gives you an environment to solve world’s most challenging business problems. “Welcome to future problem-solving. Welcome to the age of intelligent action.”

Releases:

MCC release the two major sources to the public for their furthermore researchers and for their work and implementation. The two of the module is given below;

OpenCyc:

In June 2012, the newer version of OpenCyc of 4.0, released. As it is stated before that Cyc lie on some relations so OpenCyc 4.0 includes the ontology of whole Cyc which contains terms in millions, also with millions of human-like declarations related to the expressions with each other; however, these are mostly taxonomic proclamations, in Cyc the difficult rules aren’t available in it. Knowledge-based include 239,000 concepts and 2,093,000 facts and which can be seen on the OpenCyc.org website.

OpenCyc is no longer available in the era of 2017. The OpenCyc’s very first version was released in 2002, spring, and contains a considerable amount of concepts and facts which are 6,000 concepts and 60,000 facts. The knowledge-based released under the open license. For meeting the
needs of its users, Cycorp was specified its intentions for releasing OpenCyc under parallel and unhindered licenses. CycL and SubL interpreter (the program for browsing and editing the databases and for drawing inferences as well) released free of cost, but as a dualistic. It is also available for the operating systems like Linux and Microsoft Windows. Texaiproject was released the RDF supported contents which extract from OpenCyc.

**ResearchCyc:**

Before 6 months of the releasing date of OpenCyc at July 2006, Cycorp releases the executable of ResearchCyc 1.0 version. This version of Cyc aimed at the research community, free of cost while the ResearchCyc in the beta stage of its development in the 2004 and then finally it was released to open source for researchers on January 2005. Also the taxonomic information exists in OpenCyc, ResearchCyc rather than syntactical knowledge it involves considerably additional semantic information like more facts about concepts in its knowledge-base system, and comprises a large dictionary, English analyzing and cohort tools, and Java-based user interfaces for knowledge enhancing and enquiring. Moreover, it holds a system for **Ontology-based** data amalgamation.

**Cyc’s Applications:**

**Knowledge based terrorist detection:**

The knowledge base terrorism detection application or system of Cyc which is under development whose aim is to contains all the information about the “terrorist” groups, their group members also those members who are leading their groups, philosophy, creators, guarantors, associations, services, sites, capitals, competences, purposes, deeds, strategies, and full metaphors of exact terrorist actions. The information is stored as reports in mathematical reasoning, appropriate for computer sympathetic and cognitive.

**Cyclopedia:**

Cyclopedia is being developed; it overlays Cyc keywords on sheets occupied from Wikipedia sides.

**Cleveland clinic foundation:**

The Cleveland Clinic used Cyc to develop a natural-language interface for biomedical information and queries. The question is construed into a set of **CycL** (higher-order logic) parts with open variables, then after put on various limitations like medical-
domain knowledge, human like commonsense, syntax, and many more. There is a way to fit those fragments together to form one semantically expressive official query.

**Methodology:**

All the concepts, which are used in Cyc are known as “**Constraints**”. Which are start from an optional syntax of "#$" and which are case-sensitive. Many coefficients are:

- #$BillClinton or #$Face means individual item known as **individuals**.
- More than one means, **Collections**, such as #$Tree-ThePlant (containing all trees) or #$EquivalenceRelation (including all correspondence relations). A fellow of a collection is called an **instance**.
- For specific one, which produces new terms are known as **Functions**. For example, #$FruitFn, when providing them an argument which describes a type of plant (s), will give the collection of its fruit. Conventionally, function constants begin with upper-case letter and end at string "Fn".

**Truth Functions**, returning of either true or false value which can be applied to one or more other concepts are done by these functions. For example, #$siblings are the name of fraternal relationship, which is true if and only if when two arguments that are passed, are siblings. Starting letter of the constants of these functions is lower-case. Truth functions are divided into **logical connectives**, **quantifiers**, and **predicates**.

Important bases are #$isa and #$genls. Where the first one predicate or base define that one item is an instance of some collection while, on the other hand, the second one describe that one collection is the sub-collection of some other collection. Facts about concepts are declared using sureCycL **sentences**. Predicates are written before their arguments, in parentheses:

```
(#$isa #$Bill Clinton #$United States President)

"Bill Clinton belongs to the collection of U.S. presidents" and
```
"All trees are plants."

"Paris is the capital of France."

Variables are also contained by the sentences, where strings starting with "?" sign are known as “Rules”. An important rule declared for “#Sisa” predicate reads:

It means, every instance of the collection #$ChordataPhylum (i.e. for every chordate), it is a female animal exist, who is its mother which is defined by predicate #$biologicalMother.

Knowledge-base is separated into theories known as “microtheories (Mt)”, which is the collection of concepts and facts naturally relating to a specific kingdom of information. Each “microtheory” has a name describe by unvarying constant; microtheory constants contain the string "Mt" by resolution.

3. CONCLUSION

The conclusion of the system is so complex as it is a contentious development it is a considerable big effort to step forward and try to implement whatever this field
proposal into a solitary direction. A concentrated effort required for achieving Break through. The problem of that inspire Cyc is the fragility and highly brittleness of programs. It is only the narrow of sustenance behind the programs' embryonic symbols which cause problems in expert systems, knowledge sharing system, natural language processing, and human interfaces. Cyc introduces the way to resolve this problem by the mean of the introduction of the deeper framework, in which meaning derivation by every symbol(s) by situating within a rich ontology. There is room for other modalities, like data structures didn’t only include the symbols. Finally, higher level domains can be built as analogical layers on primitive domains.
4. REFERENCES:


AN OVERVIEW ON CYBER ATTACKS AND ITS TYPES FOR ENHANCING DATA SECURITY IN BUSINESS WORLD
Noor-Ul-Qamar, Kamran Mustafa, Eisha-Tur-Rehman, Shan-e-Zahra

Abstract: For sensitive data of organizations there is a compelling need of ensuring privacy in several aspects and to inculcate protective measures in systems especially in various high-tech firms. Cyber-attacks are a wide form of threat confronted globally on the web by several users on daily basis. These attacks are fundamentally used to challenge system security of others, there are likewise some moral programmers who get into other people frameworks to make them aware about their vulnerabilities and they also get paid in return for securing such systems. In any case, these assaults have caused a great deal of concern for businessmen. This research covers the major types of cyber-attacks that can affect the business world in an immense manner along with an overview that how these threats work and how they can be possibly prevented. As the hacking mechanisms are showing signs of increased danger in a step by step manner, our frameworks should also take preventive measures to remain safe from all sorts of latest attacks on our data that can possibly attack in various forms.

Keywords: Computer Network Attack, SQL Injection, Phishing, Reconnaissance, SSL Attacks, Denial of Service
1. INTRODUCTION

A cyber-attack is an intentional misuse of personal computers on the technology-dependent corporations, companies and systems or sites. Cyber-attacks use harmful and destructive code to change coding of computer, reasoning or data, leading to disruptive effects or repercussions that can destroy the actual data and leads to cybercrimes, such as identity or personal information theft. Cyber-attack is also called Computer Network Attack (CNA). Cyber-attacks can include the following outcomes:

a) Extortion, fraudulence or identity theft.

b) Spoofing, pharming and several others like malware, phishing.

c) Hardware is being stolen, such as laptop computers or cellular devices.

d) Denial-of-service and allocated denial-of-service attacks.

e) Website defacement

f) System infiltration

g) Password sniffing

h) Exploitation of personal and general public browser

i) Instant messaging abuse

j) Unauthorized access or intellectual robbery (IP) robbery

The Institute for Security Technology Studies at Dartmouth University investigates and studies cyber-attack issues arising in police investigations and targets the constant development of IP tracing[1], real-time interception nationwide, data sharing and data evaluation.

So, the threats to user’s sensitive data and insecure mechanisms of hacking information in the business world urge the demand of preventive cautions and actions against cyber crime.
new security techniques along with its devastating types by all means.

2. TYPES OF CYBER ATTACKS THAT WE NEED TO AVOID FOR OUR BUSINESSES

2016 may be considered as the success of cyber criminals as several serious cyber threats were being faced by the people and the companies. Hackers gain access to their personal information for their own benefits. Despite of these major threats to organization in the past year, 2017 and in its ongoing years are still suspected to get along with these cyber-attacks especially business companies if they do not take any precautions.

2.1 Sql Injection

SQL Injection (SQLi) refers to an injection attack where an attacker will render malicious SQL statements through which Relational Database Management System (RDMS) can be controlled any website or web application in which SQL-based database is used probably would be affected by SQL injection using advantage of its vulnerability. It is stated that this can be used by an attacker to bypass authorizations mechanism and web application’s authentication. This further leads to get access to the contents of an entire database ultimately threatening main web application. Database records can be added, modified and deleted by using SQL injection[2].

Once control to the database is fetched an attacker is able to have unauthorized access to user’s private information through SQL injection. This data can include personally identifiable information (PII), intellectual property, trade secrets, customer belonging details and other sensitive data.

The essentials necessary for an attacker to attack an SQLIA (Structured Query Language Injection Attack) are a web browser, clever guesses of significant tables and field names having an understanding of SQL queries. URLs and user inputs are two approaches through which SQLIAs can be executed. The process for launching such an attack includes four steps. The first step ensures the identification of whether the action is susceptible to a SQLIA. This is attained by finding out if special characters are accepted as input. The conviction of particular kind of database being used by the net application is the next step of releasing a SQLIA.

Different database management systems have variable injection processes so it is beneficial to establish database type. The third step is to collect all the possible information about the database. This step is determined by the attacker’s capacity to guess field names, table properties and procedures already stored in the database. The finishing step is to install the attack, currently simple because all of the reconnaissance has already been done by the attacker[3].
2.2. MITM

In computer security and cryptography, there is an attack known as a **man-in-the-middle attack (MITM)** in which the hacker or cybercriminal probably changes the transmission mode held between two participants who assume that they are connected to their partner without interference. For instance active eavesdropping; where the offender makes temporary affiliations with the victim and data is transferred between them in a way that they believe they are talking to one another through personal connection, but actually the attacker is commanding the whole conversation.

Figure 2: Flow of SQL Injection

Figure 3: Man in the middle attack (MITIM)
range of an unencrypted wireless access points or Wi-Fi’s.

Some scientific protocols include various styles of terminating such conversations specifically to stop MITM attacks[4]; for instance, TLS (Transport Layer Security) will evidence one or each participant employing a reciprocally trusty certificate authority during this whole process.

![Diagram showing normal flow vs MITM](image)

*Figure 4: Comparison of normal flow vs MITM*

There occurs a difference of interaction when we talk about a connection of a server and a client and when there is an MITM in between. Direct and indirect communication occur in this regard. This can be seen with the help of fig4.

### 2.2.1. An illustration of the man-in-the-middle attack:

Suppose Nancy needs to speak with David. Meanwhile, Morgan wants to be a part of this speech to listen in and optionally transfer an untrue text to David. MITM is illustrated below.

a) **Morgan intercepted a message sent by Nancy to David**

Nancy "Hello David, I want your key, Its Nancy." → David known to Morgan

b) **This message is conveyed to Mallory and Bob who are unable to tell whether this is by Nancy.**
An Overview on Cyber Attacks and Its Types for Enhancing Data Security in Business World

Nancy Morgan "Hello David, I want your key, Its Alice." → Bob

c) Bob replies with his encryption key:

Nancy Morgan ← [David's key] David

d) Declaring that it is David's key, Morgan responds to Nancy by changing Bobs key with her own

Nancy ← [Morgans key] Morgan David

e) Nancy thought solely David will browse it. A message is encoded by Nancy which is assumed by her to be David's key

Alice "Need to see you at the railway stop!" [encoded with Morgan's key] → Morgan David

f) However, it is actually encoded, decoded, read, modified (if desired) by Morgan key, re-encrypt with David's key, and send it to David:

Nancy Morgan "Meet me at the van side by the cafe!" [Encoded with David's key] → David

g) According to David, he is connecting securely to Nancy.

h) Morgan robs identity of David as he goes to the van side by the cafe.

The example indicates the requirement for Bob and Alice to own a way to confirm that each other's public keys are used by them actually, instead of the general public key of an attacker. MITM attacks can be protected by using variable techniques. Two ways largely defend the MITM attacks: these include tamper detection and authentication. Some degree of guarantee about an incoming message from the sender is provided by authentication. Comparatively the means of tamper detection gives the proof.

3. PHISHING

Phishing may be one of the poisoning attacks during which the attacker tries to find out the data like login credentials by faking a reputable person in electronic mail or in IM[5].

Phishing is methodically done by considerable messaging or electronic mail to penetrate concrete data at a site that is
robbed. The messages have connections to enable malware problems. Attempts to govern the development of spoofing occurrences incorporate enactment, dependent preparing and specialized efforts by effective techniques.

3.1. Types of phishing

3.1.1. Spear phishing: The maximum used type of phishing is spear phishing. No, it's no longer a regular task, it is a trick and you are the goal. Spear phishing is an e-mail that offers an influence of being from an individual or enterprise which you know. In any case, it is not, it's from similar crook programmers who need your charge card and ledger numbers, passwords, and the budgetary facts in your PC. The need is to figure out how to ensure safety from this kind of attacks[6].

3.1.1.1. Email from a "Companion": Phishing prospers with recognition. He is aware of your call, your e-mail address, and no less than a bit approximately you. The welcome on the email message is probably going to be customized: "Hello there Bob" as opposed to "Dear Sir." The electronic mail may additionally make reference to a "shared companion". Since the e-mail seems to originate from any person you understand, this increases when you are probably less cautious and provide them the facts they request.

3.1.1.2. Utilizing your web presence against you: How could you switch into a goal of a lance phisher? More likely, from the information you put on the Internet out of your PC or mobile phone. For instance, they may take a look at casual conversation locations, find out your page, your e-mails, cope with your companions list and might
An Overview on Cyber Attacks and Its Types for Enhancing Data Security in Business World

start an attack with the aid of your enlightening partners to procure at a retail webpage. Utilizing those facts, a lance phisher ought to act like a companion, ship you an electronic mail, and illustrates a procedure.

3.2. Clone Phishing: A sort of phishing assault that can spread through an email by establishing a connection that can inculcate various addresses for sending an identical email.

3.3. Whaling: These kinds of attacks are coordinated at major concerns like respectable officials and can be a threat for people inside the organizations to affect their working[7].

3.4. Avoidance technique from phishing:

There is a remedy that gives help in encounter spoofing. The Anti-Phishing Working Group Inc. also the middle regulation's OnGuardOnline.gov gives scheme on this increasing cyber crime to refrain from spoofing charge. Intelligent load serve, for example, Wombat Security Technologies' Anti-Phishing Training Suite or PhishMe can relieve the representatives how to abandon from spoofing problems, while FraudWatch International and MillerSmiles administer the most neoteric...
spoofing mails ownership that spreads through the Internet.

4. ROGUE SOFTWARE

Rogue security software is a form of malignant programming and web extortion that deludes clients to accept that there is a harmful attack on their PC, and controls them into paying cash for a fake malware evacuation device (that really acquaints malware with the PC). It is a type of product that controls clients through dread, and is a type of payment product. Maverick security programming has turned into a genuine security danger in desktop figuring since 2008.

4.1. Working: A site may show a fake cautionary message expressing that somebody's machine comprises of a PC infection, and urge them through control to introduce or buy this product with the confirmation that they are obtaining certifiable antivirus programmed software. The programmers more often attempt to make the clients trust that introducing the security software’s is not always their last choice. The strategy is, not to follow everything that shows up on your PC. Counteractive action: The main answer for the issue is to utilize presence of mind and never get stuck in such circumstances. Additionally, the framework of software ought to be kept up-to-data[8].

5. MALWARE: Malware is stated as a kind of programming that can silently get to a tool without the clients notice. Web with the aid of techniques for e-mail, malwares can get approach to the system through hacked destinations, entertainment history, track data, toolbars, corrupted software, free participations, anything else you download from the web onto a device which is not always secured in opposition to malware programming. You can use a malware scanner to check if your tool is infected. The best technique to get rid of malware is to cope with discarded malwares as observed in any first-rate
antagonistic to malware programming e.g. Avast Free Antivirus.

5.1. Steps to prevent from malware: Use updated antivirus software’s to detect malware attacks. There is no other manner to cope with malware than to use an antivirus and antagonistic to malware infected machine.

6. RECONNAISSANCE: In military operations, observation is the investigation outside a region involved by amicable powers to pick up data about characteristic components and adversary nearness. Cases of surveillance incorporate watching by troops, ships or submarines, satellites, or by setting up disguised perception posts. Since observation is military's exceptional strengths working in front of its fundamental powers; spies are non-warriors working behind adversary lines. There are two sorts of observation assaults:

- Active
- Passive

Latest observational attacks are the point at which an attacker searches for private data without drawing in with the casualty's frameworks. The two types occur once in a while where reconnaissance is obtained from its utilization in military varying from the dynamic assaults[9].

6.1. Working and prevention: In a PC security measures is for the most part a preliminary step towards stopping a future attack. The attacker often possibly uses port addresses to locate any feeble ports. After a port scope is revealed the vulnerabilities of organizations related with open ports are perceived. For remedial action the slightest complex way to deal with suspect most port or to yield attacks or reconnaissance strikes is to use an Intrusion Prevention System and add firewall. The firewall controls the ports which are displayed to whom they are exhibited. The IPS can perceive port outcomes in time and close them down before the attacker can get a full guide of your framework.

7. SSL ATTACKS: Secure Sockets Layer (SSL) is a PC networking protocol for securing associations between an organized application of customers and servers over an unreliable system like the web. Because of various conventions SSL was expostulated for use on the web by the Internet Engineering Task Force (IETF) in 2015 and has been supplanted by the Transport Layer Security (TLS) convention[10].SSL keeps running over the network layer and the transport layer, which are in charge of the vehicle of information amongst forms and the directing of system movement over a system amongst customer and server and underneath application layer, for example, HTTP and the Simple Mail Transport Protocol[11].
7.1. **Working:** An SSL assault type blocks the scrambled information before it may be encoded, enabling the assailant to approach to sensitive information including Visa data and standardized saved numbers. It enables attacker to get to passwords, other confirmation tokens and cookies.

8. **DENIAL OF SERVICE**

In Denial of service: (DoS), a mastermind seeks a chance of making a network resource unavailable through some temporary settings. It is a cyber-attack that can affect a machine targeting some intended users by disrupting the services of a host connected by means of a network. It works by over flooding the machine with so many requests at a time that its gets in a halt state or in such a position that no important requests of the users are satisfied.

Some of the important defensive measures in this regard include IPS based prevention, Firewalls, router and switches for rate limiting and traffic shaping and upstream filtering[12].

9. **DRIVE BY DOWNLOADS:** A drive-by download is a program that is consequently downloaded to your PC without your assent or even your insight. Not at all like a pop up download, which requests consent (but in a figured way prone to prompt a "yes"), a drive-by download can be started by just going by a Web website or review a HTML email message. In the event that your PC's security settings are not up to the mark, it might be workable for drive-by downloads to happen with no further activity on your parts[13].

10. **MALVERTISING:** Malvertising is the utilization of web based publicizing to spread malware. Malvertising includes infusing malignant or malware-loaded commercials into true blue web based promoting systems and web pages[9]. Publicizing substance can be embedded into prominent and respectable sites, malvertising give cyber criminals a chance to push their attacks to web clients who may not generally observe the advertisements, because of firewalls. Malvertising is appealing to assailants since they 'can be effortlessly spread over a substantial number of sites without specifically trading off those websites'. Malvertising is a genuinely new idea for spreading malware and is much harder to battle since it can work its way into a site page and spread through a framework unconsciously. Attackers have a wide reach and they can convey these assaults effectively through commercial systems. Organizations and sites have experienced issues decreasing the quantity of malvertising assaults, which "recommends that this attacking vector is not probably going to vanish soon[14].

10.1. **Working and prevention:** Sites or web distributors accidentally consolidate a vindictive notice into their page. PCs can end up noticeably infected by a pre-snap and post click. It is a misguided judgment that problem just happens when users start tapping on a malvertisement.
Malware can likewise auto-keep running, as on account of auto diverts, where the client is naturally taken to an alternate site, which could be noxious. To keep malvertising from tainting your PC, you have to deny misuse units the chance to discover a defect. Spieled encouraged individuals to ensure their Web programs and program modules, (for example, Java or Adobe Flash), and additionally working frameworks, to be updated with the goal that known harms are settled.

11. PROTECTION OF DATA FROM CYBER ATTACKS
To ensure a very secure and strong password. If you find a self-assertive USB stick, do not allow yourself to associate it to the remote possibility that you do not place stock in the source, you're in a perfect circumstance not putting your PC at shot. Keep away from embeddings hard drives and thumb drives you do not trust into your PC. Guarantee a site is secure before you enter particular information.

In case these things are not there, by then the framework is not secure and you shouldn't enter any information you wouldn't require. Sending essential information, for instance, Visa numbers or money related numbers puts it at risk of being hacked by software engineers or computerized strikes. When in doubt, a software engineer will use this email or site to present noxious programming onto your PC. These web components are planned to look like a common email or website, which is the way developers convince people to hand over individual information[15].

12. CONCLUSION
Through this research it is clear that there is a need to take care of the issue talked about at the outset and to protect ourselves from these malicious kinds of attacks by first and fore mostly having updated antivirus software installed. If any kind of pop up or harmful message is shown up on the screen client ought to never fears or get panic and do whatever the pop up is asking on the grounds as these are tricks utilized by programmers to inculcate user’s interest and get his/her system’s control. In addition clients need to never set those passwords which are too easy to hack. Solid passwords ought to be connected, users needs to dependably utilize latest firewalls to remain safe and never tap on advertisements or connections which they do not have any assure idea. This overview on emerging cyber-attacks in the business world along with their working and preventions opens doors for researchers to study on categories of malwares, network security measures, engineering and programming techniques using firewalls to overcome the rapid growth of attacks in all aspects.
13. REFERENCES


CONSTRUCTION OF A NEW FAMILY OF EFFICIENT IMBEDDED POLYNOMIALS WITH DISTINCT COEFFICIENTS
Aftab Ahmad Malik and Nadeem Ahmad

ABSTRACT: We propose a new family of multi-purpose imbedded polynomials having distinct coefficients. There exist relationships between various coefficients of the members of the family, which considerably reduce the computational cost of development as well as using any number of members of the family in a particular problem. Every member polynomial of degree n going through (n+1) focuses \( \{(x_i, y_i): i=0,1,\ldots,n\} \) can be constructed very easily from another member having degree (n-1). In this paper, it is shown that the family of polynomials M exists and is efficient, reliable and more accurate as compared to other available techniques. The family has been successfully applied to the problem of interpolation in this paper. Therefore, the family M is also called the Malik’s Imbedded Interpolating Polynomials (M.I.I.P). The family M gives similar results as compared to Lagrange Interpolation as far as accuracy is concerned but they are more efficient. The proposed polynomials are more efficient, more stable and more reliable as compared to other traditional interpolation methods due to remarkable reduction in mathematical operations. Our approach and the design of the method is different of available methods of prototype interpolation Methods. We have considered the drawbacks of other methods and eliminated from our approach. The superiority of the family is established and reported.

1. INTRODUCTION

The motive and incentive behind the development of the family M is the idea of imbedded numerical multiterminal rules proposed by the present author in Malik[1], Malik[2], Genz and Malik[3] & Genz and Malik[4], where computational cost in terms of mathematical operations of the higher degree rules is reduced by reusing a rule of lower degree.

While introducing the family M, we interject a polynomial \( P^{(n-1)}(x) \) of degree less or equivalent to (n-1) passing through n points \( \{(x_i, y_i): i=0,1,\ldots,n-1\} \) and then add one point more point \( (x_n, y_n) \) and interpolate a polynomial \( P^{(n)}(x) \) of degree less or equal to n using the incidents of \( P^{(n-1)}(x) \). There exist useful and relations between the coefficients of \( P^{(n-1)}(x) \) and \( P^{(n)}(x) \) which are developed in this paper.

We propose the Polynomials which shall be widely used in numerical Analysis, mathematics and Science in the form of equations to tackle several problems. It is well known that a polynomial is a relationship between known and unknown variables and constants. Nowadays,
Aftab Ahmad Malik and N Ahmad

polynomial is extensive used in curve and surface design in Computer graphics for modelling of the objects. Our polynomial shall cater for numerical description of the objects in terms of shape and size. Using these polynomials we may formulate points, line, polylines (a chain of connected line segments), polygons, smooth curves, wireframe models etc.

According to Griffiths & Smith[6] in Lagrange interpolation high number of mathematical operations are required to compute an interpolating polynomials number of points \((x_i, y_i)\) increase. Moreover, there is exist another problem related to the efficiency of the Lagrangian approach if new data points are added to a set that has already been operated on, we shall have to use all points to interpolate the polynomial afresh making the application inefficient. In the family M both of these above mentioned problems have successfully overcome because we find the next degree polynomial by using the previously evaluated coefficient of the polynomial of the lower degree. Therefore, we overcome the difficulties mentioned Griffiths & Smith [6].

Assumptions:

All members of family M allow:

- Some basic arithmetical and mathematical operations i.e. addition, subtraction, multiplications.
- Polynomials also obey commutative, associative, and distributive Laws.
- A sum or product of polynomials member is a polynomial.
- The derivative and anti-derivative of a member polynomial function is a polynomial function.
- The simple algebraic, trigonometric, polar, inverse trigonometric, hyperbolic, inverse hyperbolic, logarithmic and exponential function to be expressed in terms of transnational form & in any appropriate member of the family M, using existing mathematical formalism and techniques.
- The degree \(d\) of any member in non-negative integer: \(0 <= d <= n\).
- Every member of M can be evaluated using Horner’s Rule [5].
Definitions and Notation:

We define:

- **Polynomial of degree 0:** \( P^{(0)}(x) = B_0^{(0)} : \text{A line parallel to x-axis} \) \hfill (1)
- **Polynomial of degree 1:** \( P^{(1)}(x) = B_0^{(1)} + B_1^{(1)}x \) \hfill (2)
- **Polynomial of degree 2:** \( P^{(2)}(x) = B_0^{(2)} + B_1^{(2)}x + B_2^{(2)}x^2 \) \hfill (3)
- **Polynomial of degree \((n-1)\)** passes through \(n\) points \(\{(x_i, y_i): i=0,1,\ldots,(n-1)\}\) \hfill (4)
- **Polynomial of degree \(n\),** goes through \((n+1)\) focuses \(\{(x_i, y_i): i=0,1,\ldots,n\}\) \hfill (5)
- **Basis Polynomial:** We use Lagrange Interpolation Polynomial as basis polynomials to develop the family \(M\), where \(M = \{ P^{(0)}(x), P^{(1)}(x), P^{(2)}(x), \ldots, P^{(n-1)}(x), P^{(n)}(x), \ldots \}\) \hfill (6)

In Lagrange Interpolation, we write \(n\)th degree Polynomial as

\[
P^{(n)}(x) = \sum_{i=0}^{n} L_i(x) y_i
\]

\hfill (7)

where \(L_i(x)\) is a function of \(x\) called Lagrange coefficient having a either value zero or one s.t. \(L_i(x_j)=0\) for \(i\neq j\) and \(L_i(x_i)=1\) for \(i=j\). It is like Keroneker delta and

\[
\prod_{j=0}^{j=n} [(x-x_j)/(x_i-x_j)]
\]

where \(L_i(x_j) = \left\{ \begin{array}{ll} 1 & \text{s.t. } i=j \end{array} \right\} \hfill (8)

\[
P^{(n)}(x) = \sum_{i=0}^{i=n} \left\{ \prod_{j=0}^{j=n} [(x-x_j)/(x_i-x_j)] \right\} y_i
\]

therefore, \hfill (9)

\[
\text{s.t. } i=j
\]

Presentation and Construction of New Family \(M\):

\[
A_i^{(n)} = y_i \prod_{j=0}^{j=n} [1/(x_i-x_j)]
\]

Assume: \hfill (10)

\[
\text{s.t. } i=j
\]
\[ P^{(n)}(x) = \sum_{i=0}^{i=n} \left[ \prod_{j=0}^{j=n} (x - x_j) \right] A_i \]  

Then
\[ \prod_{j=0}^{j=n} (x - x_j) \quad \text{s.t.} \quad i \neq j \quad \text{...(11)} \]

The product terms \( s.t \ j!\neq i \) are very important for the construction of family \( M \) of degree \( n \). They are \( n \) in number, excluding the one for \( i=j \). Let us now compose our Polynomials:
Let us rewrite the polynomials as follows:

**Polynomial of degree 1**:  
\[ P^{(1)}(x) = B_0^{(1)} + B_1^{(1)} x \]
where \[ B_1^{(1)} = A_0^{(1)} + A_1^{(1)} \], \[ B_0^{(1)} = -(A_0^{(1)} x_1 + A_1^{(1)} x_0) \]  
...(12)

Using (10):
\[ A_0^{(1)} = y_0/(x_0 - x_1) = y_0/\prod_{j=0, j\neq 1}^{j=1} (x_0 - x_j) \]  
...(13)

and
\[ A_1^{(1)} = y_1/(x_1 - x_0) = y_1/\prod_{j=0, j\neq 1}^{j=1} (x_1 - x_j) \]  
...(14)

**Polynomial of degree 2**:  
Now we Compute the coefficients of \( x^2 \)
as follows:
\[ B_2^{(2)} = A_0^{(2)} + A_1^{(2)} + A_2^{(2)} \]  
...(15)

\[ B_1^{(2)} = -(B_2^{(2)} x_0 + x_1) - B_1^{(1)} \]  
...(16)

\[ B_0^{(2)} = (B_2^{(2)} x_0 x_1 + B_1^{(2)}) \]  
...(17)

where
\[ A_0^{(2)} = \frac{y_0/[(x_0 - x_1)(x_0 - x_2)]}{\prod_{j=0, j\neq 1}^{j=1} (x_0 - x_j)} \]  
...(18)

\[ A_1^{(2)} = \frac{y_1/[(x_1 - x_0)(x_1 - x_2)]}{\prod_{j=0, j\neq 1}^{j=1} (x_1 - x_j)} \]  
...(19)

\[ A_2^{(2)} = \frac{y_2/[(x_2 - x_0)(x_2 - x_1)]}{\prod_{j=0, j\neq 1}^{j=1} (x_2 - x_j)} \]  
...(20)

Notice in Equations (16) & (17), we use the coefficients of polynomial of degree 1 to compute the coefficients of 2nd degree.

**Polynomial of degree 3**:  
This polynomial passes through 4- points \( \{(x_i, y_i): i=0,1,2,3\} \).
Actually working out and deriving the coefficients of 
\[ P^{(3)}(x) = B_0^{(3)} + B_1^{(3)} x + B_2^{(3)} x^2 + B_3^{(3)} x^3 \]  
.....(21)

it implies that:
\[ B_3^{(3)} = A_0^{(3)} + A_1^{(3)} + A_2^{(3)} + A_3^{(3)} \]  
.....(22)
\[ B_2^{(3)} = -(B_3^{(3)}(x_0 + x_1 + x_2) - B_2^{(2)}) \]  
.....(23)
\[ B_1^{(3)} = (B_3^{(3)}(x_0x_1 + x_0x_2 + x_1x_2) + B_1^{(2)}) \]  
.....(24)
\[ B_0^{(3)} = -(B_3^{(3)}(x_0x_1x_2) - B_0^{(2)}) \]  
.....(25)

where:
\[ A_0^{(3)} = y_0 / [(x_0 - x_1)(x_0 - x_2)(x_0 - x_3)] \]  
.....(26)
\[ A_1^{(3)} = y_1 / [(x_1 - x_0)(x_1 - x_2)(x_1 - x_3)] \]  
.....(27)
\[ A_2^{(3)} = y_2 / [(x_2 - x_0)(x_2 - x_1)(x_2 - x_3)] \]  
.....(28)
\[ A_3^{(3)} = y_3 / [(x_3 - x_0)(x_3 - x_1)(x_3 - x_2)] \]  
.....(29)

It may be noted that to compute the coefficients of a 3rd Degree polynomial, we use four previously known quantities without any fresh calculations i.e. \( B_2^{(2)} \), \( B_1^{(2)} \), \( B_0^{(2)} \) & \( B_3^{(3)} \).

We observe that there exist a peculiar pattern as for as the occurrence of x-coordinates such as \((x_0,x_1,x_2,x_3)\) in the coefficients of various Polynomials. They occur as sum of the products one taken at a time, sum of pairs, sum of triplet etc as shown below:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Sum with Single terms</th>
<th>Sum with Pairs</th>
<th>Triplets</th>
<th>Four taken at a time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>x0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>x0 + x1</td>
<td>x0X1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>x0 + x1 + x2</td>
<td>x0X1 + x2</td>
<td></td>
<td>x0X1X2,</td>
</tr>
<tr>
<td>*</td>
<td>x0 + x1 + x2 + x3</td>
<td>x0X1X2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>x0 + x1 + x2 + x3</td>
<td>x0X1X2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Number of Subscripted Variables (x-coordinates)
In view of Table 1 and applying the strategy of Equations (12) to (29), we express our Polynomial of Degree 4:

\[ P^{(4)}(x) = B_0^{(4)} + B_1^{(4)}x + B_2^{(4)}x^2 + B_3^{(4)}x^3 + B_4^{(4)}x^4 \]

Where

\[ B_4^{(4)} = A_0^{(4)} + A_1^{(4)} + A_2^{(4)} + A_3^{(4)} + A_4^{(4)} \]

\[ B_3^{(4)} = -(B_4^{(4)}(x_0 + x_1 + x_2 + x_3) - B_3^{(3)}) \]

\[ B_2^{(4)} = (B_4^{(4)}(x_0x_1 + x_0x_2 + x_0x_3 + x_1x_2 + x_1x_3 + x_2x_3) + B_2^{(3)}) \]

\[ B_1^{(4)} = -(B_4^{(4)}(x_0x_1x_2 + x_0x_1x_3 + x_0x_2x_3 + x_1x_2x_3) - B_1^{(3)}) \]

\[ B_0^{(4)} = -(B_4^{(4)}(x_0x_1x_2x_3) + B_0^{(3)}) \]

In this rule, we use 5 coefficient values which are previously available i.e. 
\[ B_4^{(4)}, B_3^{(3)}, B_2^{(3)}, B_1^{(3)} \text{ and } B_0^{(3)}. \] This aspect reduces the computational cost in terms of mathematical operations of our technique up to great extent, which will be analyzed in comparison with other existing methods.
2. REFERENCES:


Review on Huawei Fusion Sphere Security
Sabir Abbas, Shan-e-zahra, Noor-ul-Qamar

Abstract: The cloud computing virtualization stage is another method for giving computing resources that give clients available and financially savvy benefits, and bring hazards in meantime. In this way, ensuring the privacy, trustworthiness and accessibility of client information turns out to be significantly more basic to distributed computing frameworks. Huawei gives the virtualization stage security answers for confronting the dangers and difficulties postured to the distributed computing framework. This article portrays the techniques and measures received by Huawei cloud computing virtualization stage to react to the security dangers and also dangerous to distributed computing frameworks. Huawei cloud computing virtualization stage is intended to give secure and solid server virtualization solutions for clients.

Keywords: FusionSphere, Cloud Security, Cloud Computing, Huawei Architecture.

1. INTRODUCTION

Developed by Huawei, FusionSphere is a cloud operating system that meets the needs of customers from a wide range of industries. FusionSphere offers powerful virtualization and resource pool management functions, comprehensive cloud infrastructure components and tools, and open application programming interfaces (APIs).

It helps enterprises to horizontally consolidate physical and virtual resources in data centers and vertically optimize service platforms, facilitating the construction and use of cloud computing platforms. In July 2014, the outstanding performance of Huawei’s FusionSphere led to Huawei becoming the only company added to Gartner’s Magic Quadrant for x86Server Virtualization Infrastructure during that year. FusionSphere was also recognized as an up-and-coming product in emerging markets [1][2].

FusionSphere integrates OpenStack architecture to build up
Review on Huawei Fusion Sphere Security

a software-defined data center capability (including SDS and SDN) and optimal automated management capabilities, and supports commercial use of cloud-based telecom services (NFV and network function virtualization)[5]. In addition, FusionSphere is an open, agile, and reliable cloud OS that aims to help enterprises and carriers deploy server virtualization, as well as private, public, and hybrid cloud services. Therefore, enterprises can use standard OpenStack architecture and APIs to choose freely from OpenStack-based third-party products and services, making cloud computing easier[6][8]. Here is the Architecture of FusionSphere:[1]

**Fig 1: Architecture of FusionSphere**

**Fig 2: Fusion Sphere Advantages**

**FUSIONSHERE COMPONENTS**

2. LITERATURE REVIEW
Huawei provides the virtualization platform security solution to face the threats and challenges posed to the cloud computing system.

Figure 3: Structure of the virtualization platform security solution

Each layer of the security structure is described as follows:

2.1. Log Security Management
Administrators can view logs to ascertain system running status and operation records, thereby auditing user behaviors and locating problems. An operation log records the operation a user has performed on the system, for example, logging in to the system, logging out of the system, or creating a VM, as well as the result of the operation. The operation logs can help administrators check whether the system is under attacks or malicious operations are performed[2][9].

2.2. Account and Password Management
On Fusion Manager, administrators can change user passwords periodically to ensure password security.

2.3. Rights Management
Fusion Manager provides comprehensive rights management functions. User permissions are controlled by organization and domain[2]. This helps isolate the data of different organizations and domains and secure the internal resources of the system.

2.4. Web Security Management
The framework supports against web application assaults, for example, SQL infusion and cross-website scripting. A realistic confirmation code is required on the login page. On the web-based login page, the framework creates an irregular confirmation code. A user can log in to the system only when the user name, password, and verification code they entered are correct. Note: On first login, users are not required to enter the verification code. However, if they enter an incorrect password, they will be asked to enter the
verification code during the next login attempt. The web management system is automatically locked if no user activity is detected in a preset period of time[2].

2.5. **Data Security Management**

Essential security settings are executed to guarantee secure working of databases. The accompanying security-related measures are gone up against a PostgreSQL database:

1. Logs operations performed on the PostgreSQL database.
2. Prevents remote access to the database.
3. Backs up information to reestablish the database in case of a database disappointment.

2.6. **OS Security Management**

The Fusion Manager system uses a SUSE Linux OS. Basic security settings are configured to protect the security of the SUSE Linux OS, including: [10]

1. Disables unnecessary services, such as Telnet and FTP services.
2. Hardens the secure shell (SSH) service.
3. Controls the access permission on files and directories.
4. Records operation logs.

2.7. **Security Against Malformed Packet Attacks**

Because Fusion Manager interacts with end users on untrusted networks, it may be vulnerable to malformed packet attacks. Fusion Manager has been fully tested using tools, such as Codenomicon and xDefend, on its capability of defending against malformed packet floods, ensuring the security of the Fusion Manager system during interaction with end users[3][10].

2.8. **Data Backup**

In the Fusion Sphere solution, one or more copies of backup data are stored so that data is not lost and services are not affected even if storage devices such as hard disks become faulty. The system performs a bit- or byte-based verification on data stored in disks, and distributes verification information to each disk in a disk array. During the distribution, the system makes sure that a data block and its verification information are stored on different disks. In this way, damaged data can be reconstructed based on other data blocks and corresponding verification information after a disk is damaged [4].
3. PROVEN SUCCESS

Huawei FusionSphere has served customers in 42 countries and regions around the globe, covering fields ranging from government and public utilities to telecommunications, energy, finance, transportation, health care, education, media, manufacturing and other industries. FusionSphere helps customers integrate and optimize their data centers and service platforms, improving system reliability and IT efficiency [5][6].

![FusionSphere has proven to be among the most cost-effective virtualization platforms available today. FusionSphere employs a bare-metal virtualization engine that consumes less than 3% of physical CPU resources, yet this engine improves server utilization up to 60% and reduces costs for IT infrastructure deployment by 30%.

FusionSphere provides visual application templates to implement one-click application deployment and highly effective operation and maintenance (OAM). In addition, FusionSphere licenses are charged only by the number of physical CPUs the services use, and not counting any other in-use physical resources.

FusionSphere provides high availability and metropolitan area auto-active disaster recovery (DR). These capabilities enable IT services that run on the FusionSphere platform to be backed up and recovered in the event of a disaster. Live migration allows the system to be upgraded or maintained without service interruption.

The exclusive functions of Health Advisor and Operation Recorder are able to provide operator early warning service and fast fault positioning on system exception.

System operation is the key element that determines the virtualization system utilization efficiency for enterprise cloud computing. Huawei FusionSphere provides visual templates that allow customers to create virtual data centers, simplifying cloud computing operations. FusionSphere’s open and integrated platform provides Huawei’s extended application programming interfaces (APIs). FusionSphere also supports the OpenStack APIs, allowing customers to quickly deploy on-demand cloud services.

Fig 4: Proven Success of Fusion Sphere

4. CONCLUSION

Cloud Computing systems can face traditional security threats from external network like IP attacks, OS and software loopholes, Virus, SQL injection, Phishing, Zero-day attacks and from intranet include Ever-changing attacks pose difficulties for prevention, Worms and viruses are spread through loopholes if patches and virus database are not upgraded to the latest version, causing tremendous security threats, Confidential information disclosure happens frequently because of unauthorized Internet access activities, Convenient mobile device access challenges intranet security and Data leakage and virus spreading occurs due to the lack of peripheral management. So the Huawei fusion sphere provides the virtualization platform security solution to face the threats and challenges posed to the cloud computing system. Fusion sphere manager manages the cloud security in all aspects.
5. REFERENCES


LEARNING MANAGEMENT SYSTEM AND ITS IMPLEMENTATION
Salman Zafar, Dr. Nabeel Tahir

Abstract: As the world is moving towards autonomous technology and every aspect of human lives is influenced by technology so does the academics and academic institutions, learning management systems work in academic institutes across the globe, this paper gives a comparison between different learning management systems and their comparative analysis, it will help any individual who wants to compare and choose the best learning management system with respect to the requirements of their institute.

1. INTRODUCTION
By the start of 21st century, every single aspect of human life is moving towards technology. The advancement in technology has changed the way humans live their lives, whether we talk about industry, market or academics. In the field of academics new and innovative ways of learning are constantly produced to make human lives easier as well as boost up learning [1]. For this purpose, learning management systems are being deployed across the globe. Few of the LMS include Blackboard, Moodle and success factors.

Moodle is an open source learning management system which is based on the web platform of PHP MySQL. It offers a dynamic environment for the education sector. It is used for the number of different services in an educational institute. Few of the uses of Moodle are blended learning it provides a learning environment using different platforms as well as new and innovative ways. E-learning is a mechanism in which all the students are provided with an E-Learning environment where the usage of paper environment is finished from the institutes using brick and motor system [2]. Teacher Management allows the teacher to manage their classes, courses, students, to-do list as well as conduct assignments, quizzes and exams online. Student Management provides with the facility where students can download their course outlines, contents as well as upload assignments for assessment and attempt quizzes and exams. They
are also able to communicate with their lecturers, tutors, lab attendants as well as other students. *Course Management* allows new courses to be structured, updated or deleted. Add new content, assignments as well as quizzes. *Exam Management* system provides a dynamic and wide range of exam solutions, teachers can set up an exam, conduct it as well as evaluate it. *Report generation* Moodle allows the Administration to generate reports to evaluate the performance of each individual including teachers and students [3].

<table>
<thead>
<tr>
<th>Calendar/ Progress Review [3]</th>
<th>Blackboard Learn (Release 9.1)</th>
<th>Moodle 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor and students can post events in the online course calendar.</td>
<td>Instructors and students can post events in the online course calendar.</td>
<td>Instructors and students can post events in the online course calendar.</td>
</tr>
<tr>
<td>Instructor can post announcements to a course announcement page. Students have a personal home page that lists all courses in which the student is enrolled, new email and all course and system-wide events from their personal calendar. Students can view their grades on completed assignments, total points possible, course grade, and compare their grades against the class performance.</td>
<td>Instructor can post announcements to a course announcement page. Students have a personal home page that lists all courses in which the student is enrolled, new email and all course and system-wide events from their personal calendar. Students can view their grades on completed assignments, total points possible, course grade, and compare their grades against the class performance. Students can subscribe to RSS feeds to be notified of changes to materials.</td>
<td></td>
</tr>
<tr>
<td>Searching Within Course [3]</td>
<td>Students can search all discussion threads</td>
<td>Students can search all discussion threads. Students can search chat or virtual classroom session recordings.</td>
</tr>
<tr>
<td>Module Page [2,3]</td>
<td>Similar to dashboard notifications on the Blackboard home page. Modules contain information for instructors and students about new content and due dates for the current course.</td>
<td>Modules: Upcoming events and recent activity both displayed left hand side of the course material. Can be docked as a tab to the left of the page.</td>
</tr>
<tr>
<td>Community Networking [3]</td>
<td>If allowed, at system level, students can create online clubs, interest, and study groups. These groups can have their own catalog, templates, discussion boards and more.</td>
<td>Major focus of Moodle 2.0 allowing different Moodle installations to network. Idea is for instructors to be able to access a location where they can share with peers - in their own topic - best practice, ideas and resources. Also allow users to join in with communities of practice that might be hosted by other sites. The functional aspect is to allow anyone to turn their Moodle site into a Moodle Community Hub, with seamless log-in between Moodles, but also with the login secure and fully controlled by site administrators.</td>
</tr>
<tr>
<td>Course Menu [3]</td>
<td>Click ‘+’ icon to access the choice list</td>
<td>Menu is automatically updated with links to new</td>
</tr>
<tr>
<td>Assignments [2, 3]</td>
<td>New 9.0 – Multiple attempts for submission (example revisions) New 9.0 – Assignment submission for groups by an individual.</td>
<td>Assignments can be completed online or offline (file uploads). Moodle allows for multiple file uploads. Also assignments are treated as ‘draft’ until the “send for submission” button pressed.</td>
</tr>
<tr>
<td>Custom grading view and grading preferences [2, 3]</td>
<td>Smart view can be used and in turn made a favourite making it available from the front page example showing on instructor’s front page students who are falling under a certain grade.</td>
<td>Enhanced Gradebook in Moodle 2.0, with functionality such as assignment of personal grade letters to percentages. Can also edit directly in spreadsheet view.</td>
</tr>
<tr>
<td>Blackboard Learn (Release 9.1)</td>
<td>Moodle 2.0</td>
<td></td>
</tr>
<tr>
<td>Group Organizing [3]</td>
<td>Group created first and then modified manually later to add users. Instructor can allow students to create their own self-enrolled groups and edit their student-created groups.</td>
<td>Groups created first then group members selected from list on same page. Automatic allocation available. Students can also self-select groups.</td>
</tr>
</tbody>
</table>

2. HISTORY

Moodle was formerly developed by Martin Dougiamas to help educators create online classes with a give attention to interaction and collaborative construction of content, and it is in continuous evolution. The first version of Moodle was released on 20th August 2002. Nowadays the Moodle is being monitored and updated by Moodle HQ, an Australian company of developers.
which is supported by a network of eighty-four Moodle Partner service companies worldwide [5]. Moodle's development has also been assisted by the work of open-source computer programmers. Moodle as a learning platform can boost existing learning environments. As an E-learning tool, Moodle has a variety of standard and ground-breaking features such as calendar and Grade book. Moodle is a leading virtual learning environment and can be used in many types of environments such as education, training, and development in business settings. Following are the versions of Moodle since the start of the production till date and their added features and final product.

Table 1: Comparative analysis between different versions of Moodle

<table>
<thead>
<tr>
<th>Version</th>
<th>Release Date</th>
<th>Added Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>20-08-2002</td>
<td>Basic</td>
</tr>
<tr>
<td>1.1</td>
<td>29-08-2003</td>
<td>Basic</td>
</tr>
<tr>
<td>1.2</td>
<td>20-03-2004</td>
<td>Added logins</td>
</tr>
<tr>
<td>1.3</td>
<td>25-05-2004</td>
<td>Messenger</td>
</tr>
<tr>
<td>1.4</td>
<td>31-08-2004</td>
<td>Bulk logins</td>
</tr>
<tr>
<td>1.5</td>
<td>05-06-2005</td>
<td>Grade books</td>
</tr>
<tr>
<td>1.6</td>
<td>20-05-2006</td>
<td>Grading standards</td>
</tr>
<tr>
<td>1.7</td>
<td>07-11-2006</td>
<td>Calendars</td>
</tr>
<tr>
<td>1.8</td>
<td>30-03-2007</td>
<td>Same</td>
</tr>
<tr>
<td>1.9</td>
<td>03-03-2008</td>
<td>New grade book, Bulk user actions, Tagging.</td>
</tr>
<tr>
<td>2.0</td>
<td>24-11-2010</td>
<td>Integration with plagiarism detection/prevention tools</td>
</tr>
<tr>
<td>2.1</td>
<td>01-06-2011</td>
<td>Advanced grading methods like Rubrics</td>
</tr>
<tr>
<td>2.2</td>
<td>05-12-2011</td>
<td>Drag and drop files</td>
</tr>
<tr>
<td>2.3</td>
<td>25-06-2012</td>
<td>Same</td>
</tr>
<tr>
<td>2.4</td>
<td>03-12-2012</td>
<td>Same</td>
</tr>
<tr>
<td>2.5</td>
<td>14-05-2013</td>
<td>Badges</td>
</tr>
<tr>
<td>2.6</td>
<td>18-11-2013</td>
<td>Annotate uploaded PDF, bulk course creation, multiple calendars</td>
</tr>
<tr>
<td>2.7</td>
<td>12-05-2014</td>
<td>ATTO HTML Editor, responsive design, log in</td>
</tr>
<tr>
<td>Features:</td>
<td>1. <strong>Built for learning globally</strong></td>
<td>2. <strong>Proven and trusted worldwide</strong></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Provides a web-based platform where user does not have to be on campus to access their accounts. They can access their courses, upload their assignments and attempt their quizzes from virtually anywhere in the world.</td>
<td>As Moodle is being used from a long period of time, Moodle is pioneers in creating a dynamic LMS, Provides SSL encryption in the latest version, has high security protocols and is being used in the big names of academics such as Monash University, Federation University etc.</td>
<td>It is designed to create new innovative ways for teachers but still keeps the charm of traditional teaching styles [6]. It supports teachers in providing students with new and better ways to learn using different content as well as different perspective of study.</td>
</tr>
</tbody>
</table>
5. **Free with no licensing fee**

Moodle is completely free open source learning management system. One doesn’t have to pay to get the license.

6. **All in one learning platform**

It provides a dynamic E-learning platform, which covers the entire academic usability; Moodle is more than enough for an institute to cover all their academic needs [7].

7. **Highly flexible and fully customizable**

As it is developed on PHP MySQL, it is highly robust and fully customizable, one can customize the theme or the way it is represented and even the way it operates [8]. So, every institute customizes it with respect to their own requirements.

8. **Robust, secure and private**

It’s completely private as every user has their own access account. Their accounts are secured with SSL encryption logins and it is highly secured and maintains the data in worst conditions possible.

9. **Use anytime, anywhere and on any device**

As Moodle is a web-based dynamic software, it can be accessed on laptops, IPad and any other kind of handheld devices from anywhere across the world with a simple single requirement i.e. internet.

10. **Comparative study between Moodle 2.7 and 3.2**

Given below is the comparative study and analysis of the two versions of Moodle and its features.
<table>
<thead>
<tr>
<th>Features</th>
<th>Version 2.7</th>
<th>Version 3.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade book</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Bulk user action</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tagging</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Plagiarism detection</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Advanced grading (Rubrics)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Drag and drop files</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Badges</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Bulk course creation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Multiple calendars</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HTML editor</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Login with email</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Text auto-save</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Likes</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Ratings</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Dashboard</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>View all grades</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Recycle Bin</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Office converter</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Notification preferences</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Font types for icons</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>

### 11. Grade book:

This feature provides a predefined book of grades for the evaluation of assignments, quizzes and exams of students. It provides ease for the teachers to evaluate as they have hardcoded marking key.
12. **Bulk user action:**

This feature allows users to communicate with huge number of other users directly and together, send them any notifications or share any files with everyone at the same time, it also allows a specific function to be performed on the number of users together at the same time [9].

13. **Tagging:**

Tagging allows any specific user to tag other users in any notification or any content they want to share with any specific individual, it can be public or private tagging.

14. **Plagiarism detection:**

This feature allows the integration of software like Turnitin, which allows both students as well as teachers to check if there is anything which is directly copied from the internet. It helps students to improve their assignments and any other documents, as well as it helps teachers to evaluate assignments and other content efficiently.

15. **Advanced grading (Rubrics):**

Parameters have become popular with teachers as a method of connecting expectations for a project, providing focused feedback on works happening and grading final products. Although teachers tend to define the word "rubric" in different ways, Heidi Andrade's commonly accepted definition is a document that articulates the expectations for a job by listing the requirements, or what counts, and describing levels of quality from excellent to poor [10].

16. **Drag and drop files:**

This feature allows a user to directly drag n drop the files they want to upload, it is not required to go through the messenger upload anymore.

17. **Bulk course creation:**

This is one of the most important features, it allows a user to create number of courses together, the need of creating each course separately is no more required as it is much more time consuming and less efficient.

18. **Multiple calendars:**

This allows creating a different calendar for every different course or class and adjusting their calendar accordingly. It makes to management easy for all the courses and necessary actions required to complete it on the basis of dates and months.
19. **HTML editor:**
This is one of the most important features, it allows the administrator to directly modify, update and write new features using the HTML editor. They can modify the look and feel of their website as well as how it operates from user’s perspective.

20. **Login with email:**
This is a simple yet very important feature, it integrates users email id with the Moodle which helps the user to login to Moodle using their email address.

21. **Auto-save:**
Any work which is being done on Moodle, either it’s an assignment made by student or quizzes made by teachers or any sort of information being typed or uploaded on Moodle is saved automatically.

22. **Likes:**
This feature allows users to like any comments, posts, announcements, content, courses and discussions; basically anything on Moodle is likable by its users.

23. **Ratings:**
This is a feature which allows students to rate teachers and vice versa. This allows students and teachers to evaluate their own performance, how students find their teaching style and behavior, because of this, teachers tend to work in the more efficient way to get their ratings improved.

24. **Dashboard:**
Dashboard is the front end display which gives access to all the necessary information to students as well as teachers on the front page of their Moodle.

25. **View all grades:**
Students can now access all their degree grades, detailed mark sheets, transcripts for each course, semester and the entire degree.

26. **Recycle Bin:**
Now deleted files are not permanently deleted from Moodle rather they stay in a recycle bin on Moodle which is now available as mentioned earlier.

27. **Office converter:**
Now users are able to convert their word files into PDF and other way around, it’s a basic converter which allows the users to change any format of Microsoft office files.

28. **Notification preferences:**
Now users can define priority to their notifications. They can priorities it according to their own requirements.
29. **Font type for icons:**

This feature allows the administrator to change the font of icons present on Moodle according to the need of their organization and users.

### 3. CONCLUSION

On the basis of above-mentioned study, it is very clear that it clearly depends upon the requirements which learning management system one wants to use, which version suits their requirements at fullest. After above conducted study helped us choose Moodle 3.2 as it has added features like text auto-save, likes, ratings, dashboard, view grades in one precise screen, new test types, online recycle bin, support for office converter, grading improvements, auto-login, sign up improvements, notification preferences. Above mentioned features clearly fulfill requirements of our institute so we choose Moodle version 3.2.
4. REFERENCES


A Non-Parametric Comparison between Advances Software Engineering Process Model

Sadia Kousar, Sundus Munir, Afrozah Nadeem, Shafia Kousar

Abstract: Software development process provides detailed guideline for development testing and maintenance of software products. It deals with the risks associated with software development and a road map to manage its complexities. In other words, software development processes are considered as optimized solution specific to any particular software product development. There are many software process models available in literature. This research performs a non-parametric comparison between formal process model, agile process model and agent based process model to aid software community in developing quality software product.

Keywords: Software engineering aspect oriented software engineering, X-Machines, Agile Methodology, formal methods,

1. INTRODUCTION
A software system is an interrelated and interacting units designed to work as single entity [1]. To model software system, software engineers uses a common framework known as System Development Life Cycle. A typical SDLC follows Planning, Requirement Analysis, Design, Code, Testing, Implementation, Maintenance phases. In 2012, the National Institute of Standards and Technology (NIST) reported that software defects cost the U.S. economy 59.9 billion Dollars annually. NIST estimated that 22 billion dollars could be saved by using efficient process modeling and testing techniques. Facts and figures of proposed NIST Report tell that software error identification and correction cost is 80% of the overall cost of software development [2]. So, there is a compelling need of efficient software development to help software developers in producing quality software products and to
save revenue that is spent on error identification and correction at later stages. In order to entertain this issue a non-parametric comparison between formal process model, agile process model and agent based process model is performed. Proposed paper is organized as follows. Section 2 expresses brief detail of formal software process model and its comparison with mentioned models. Section 3 discusses detail of agile software process model and its comparison with earlier mentioned models. Detail of agent based process model and their comparison is given in section 4. Conclusion and references are given in section 5.

2. FORMAL PROCESS MODEL
A formal process model is a model that describes the structure and methodology of a software process in mathematics based on set theory and Boolean algebra [4]. These models are considered as a foundation for describing complex or safety critical systems [5]. X-machine is formal process model that is used to write software specification as well as testing and also for verifying their implementation is behaviorally equivalent to its specification. Another application of formal process model is clean room software engineering. It is an approach that emphasizes the need to build correctness into software as it is under development [16, 17, 18]. Variety of languages and tools (Z, VDM, CSP, Petri Nets, Abstract State Machine, etc) is also available for writing specification of software [19, 20, 21, 22].

2.1. Critical distinctions between formal and other models:
- The software requirements and specification phases are refined into a detailed formal specification, which is expressed mathematically.
- The design, implementation and testing are replaced by a formal transformation phase.

3. AGILE PROCESS MODEL
These are advance methodologies based on
multiple process model e.g. iterative and incremental models with customer collaboration and involvement [5]. On each iteration (complete in two or three weeks) software engineer listen customer story and goes through each step of SDLC, analysis, design, code, test etc. on each complete iteration, software engineer wins the customer satisfaction then they starts next iteration. Most commonly used methodologies for agile process model [6] are Scrum, Extreme programming, Agile Modeling, Agile Unified Process (AUP), Agile Data Method, Responsive Development, Test Driven Development (TDD), Feature Driven Development (FDD), Behavior Driven Development (BDD), Essential Unified Process (EssUP).

4. AGENT-BASED PROCESS MODEL

Constructing high quality software for complex system is still a debate. In order to achieve this goal many software development paradigm are offered. A recent contribution in field of software engineering is agent oriented software engineering [7, 8]. An agent is software that is capable for interacting with other agents in order to meet requirement of that particular system. Widely used agent-based model are GAIA methodology and x-machine framework. According to [9, 10] an agent is an encapsulated computer system that is situated in some environment, and that is capable of flexible, autonomous action in that environment in order to meet its design objectives.

3.1. Critical distinctions between agile and other models:
- Accommodate changing requirements of customer on later stages.
- Win the customer satisfaction at each stage.

4.1. Critical distinctions between agent and other models:
- System based on agents situated in particular environment.
5. ASPECT ORIENTED PROCESS MODEL
Aspect oriented software development is an advanced technique for software development. It emphasizes on a new type of abstraction called aspect [11]. Aspect oriented Development (AOD) explicitly deals with separation of concern [12]. Primary objective of AOSD is to isolate cross-cutting concern from its primary functionality called core concern. Where, Core concerns represent primary functionality of a system and cross-cutting concerns represent non-functional requirements of software [13]. These cross-cutting concerns are modularized into separate units to increase reusability. This approach is usually used in combination with object-oriented software engineering. Aspect oriented (AO) development offers new benefits as well as new challenges to software community. Due to these new benefits and challenges it gains popularity in research community.

6. CONCLUSION
All three models are developed to manage complexities of software development. Regardless of similarities these software have many differences in term of specification, verification and testing.

In one perspective where formal development process is very efficient, reliable and offer quality product, in other perspective formal people who have good knowledge about languages and tools for formal specification, designing, testing are required. Sometime special training sessions are required to train people involved in software development process [4][5].

Secondly, agile methodologies minimize gaps between customer and software engineer; on other hand it requires very experienced developers who understand business and administration as well as
software development. And it is also difficult to estimate cost of project [6]. Thirdly, agents-based software development is a big revolution in software industry and agent-oriented decompositions are an effective way of partitioning problem of complex system, at the same time there are many pitfalls of agent models[8], one of them is understanding of the situations in which agent solutions are appropriate [9]. Beside these issues these development processes is widely accepted by software industry.
7. REFERENCES

[1] Pressman roger, prentice hall.3rd edition
Workshop on Aspect-Oriented Modeling, 2005.


