

SURVEY ON DIFFERENT CLASSIFICATION TECHNIQUES FOR DETECTION OF FAKE PROFILES IN SOCIAL NETWORKS

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ABSTRACT

In the present generation, the social life of everyone has become associated with the online social networking sites. But with their rapid growth, many problems like fake profiles, online impersonation have also grown. There are no feasible solution exist to control these problems. In this paper, survey on different classification techniques for detection of fake profiles in social networks is proposed. This paper presents the classification techniques like Support Vector Machine, Naive Bayes and Decision trees to classify the profiles into fake or genuine classes. This classification techniques can be used as a framework for automatic detection of fake profiles, it can be applied easily by online social networks which has millions of profile whose profiles cannot be examined manually.

Keywords : SVM, SNS, Decision Tree, Naive Bayes Classification, Support Vector Machine

I. INTRODUCTION

Social Networking Sites (SNS) are web-based services that facilitates individuals to construct a profile, which is either public or semi-public. SNS contains list of users with whom we can share a connection, view their activities in network and also converse. SNS users communicate by messages, blogs, chatting, video and music files. SNS also have many disadvantages such as information is public, security problem, cyber bullying and misuse and abuse of SNS platform. The security issues in SNS is divided in the following four groups: privacy breaches, viral marketing, network structural attacks, and malware attacks. The large number of users and the characteristics of the online social networks make them particularly vulnerable to malicious content propagation. Often performed in the form of URLs contained in messages, malicious attacks can lead to a very large number of people being infected in a very short time. From simple use of a profile for performing attacks, malicious actors have now moved on to a more collective and synchronized way of undertaking actions. This allows them to increase the impact of their attack by increasing the total number of targeted profiles. As a result, the detection of malicious profiles is insufficient to eradicate malicious campaigns and a characterization of them is required. At the scale of a platform, this task is complex and often hardly applicable in real time. If people select SNS to spread hate messages in a group which harms the society or organizations, then behavior of such users in SNS deviate from the normal. If there is a system which is able to identify these changes in user's behavior and give clue, then immediate action can be taken so that there is more chance to avoid the wrong things, that may happen in future, or if wrong things has happened, then this can be a clue for tracking criminals which could be used by investigation agency like CBI and NIA etc.

II. PROPOSED SYSTEM

Each profile in a social networking site contains a lots of information. Some of these information are private and some are public. Since private information is not accessible so, in this paper information that are public are used to determine the fake profiles in social network. However, if the proposed scheme is used by the social networking companies itself, then they can use the private information of the profiles for detection without violating any privacy issues. The steps for detection of fake profiles are as follows.

1. First all the features are selected on which the classification algorithm is applied. Proper care should be taken while choosing the features such as features should not be dependent on other features and those features should be chosen which can increase the efficiency of the classification.
2. After proper selection of attributes, the dataset of previously identified fake and real profiles are needed for the training purpose of the classification algorithm.
3. The attributes selected in step 1 are needed to be extracted from the profiles (fake and real). For the social networking companies which want to implement this scheme do not need to follow the scrapping process, they can easily extract the features from their database. In this paper scrapping of the profiles is done since no social network dataset is available publicly for the research purpose to detect the fake profiles.
4. After this the dataset of fake and real profiles are prepared.
5. After preparation of the training and the testing dataset, the training dataset is feed to the classification algorithm. It learns from the training algorithm and is expected to give correct class levels for the testing dataset.
6. The levels from the testing dataset are removed and are left for determination by the trained classifier. The efficiency of the classifier is calculated by calculating the no. of correct prediction divided by total no. of predictions.

The proposed framework in the figure 1 shows the sequence of processes that need to be followed for continues detection of fake profiles with active leaning from the feedback of the result given by the classification algorithm. This framework can easily be implemented by the social networking companies.

1. The detection process starts with the selection of the profile that needs to be tested.
2. After selection of the profile, the suitable attributes (i.e. features) are selected on which the classification algorithm is implemented.
3. The attributes extracted is passed to the trained classifier. The classifier gets trained regularly as new training data is feed into the classifier.
4. The classifier determines the whether the profile is fake or real.
5. The classifier may not be 100% accurate in classifying the profile so; the feedback of the result is given back to the classifier. For example, if the profile is identified as fake, social networking site can send notification to the profile to submit identification. If the valid identification is given, feedback is sent to the classifier that the profile was not fake.
6. This process repeats and as the time proceeds, the no. of training data increases and the classifier becomes more and more accurate in predicting the fake profiles.

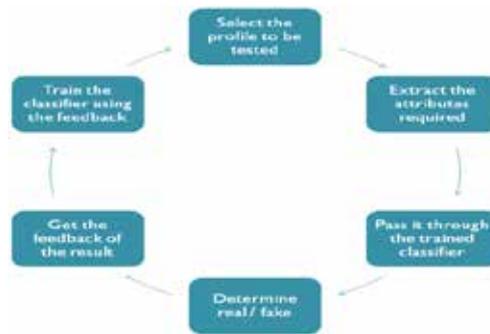


Fig 1. Proposed System

2.1 Classification Techniques

Classification is the process of learning a target function f that maps each records, x consisting of set of attributes to one of the predefined class labels, y . A classification technique is an approach of building classification models from an input data set. This technique uses a learning algorithm to identify a model that best tests the relationship between the attribute set and class label of the training set. The model generated by the learning algorithm should both fit the input data correctly and correctly predict the class labels of the test set with as high accuracy as possible. The key objective of the learning algorithm is to build the model with good generality capability. The Figure 2 shows the general approach for building a classification model.

The classifiers used for classifying the profiles are:

- 1) Naive Bayes Classification
- 2) Decision Tree Classification
- 3) Support Vector Machine

All these algorithms are the standard algorithm and is widely used in problems such as detecting spam email messages, categorizing cells as malignant or benign based upon the results of MRI scans, classifying galaxies based upon their shapes etc.

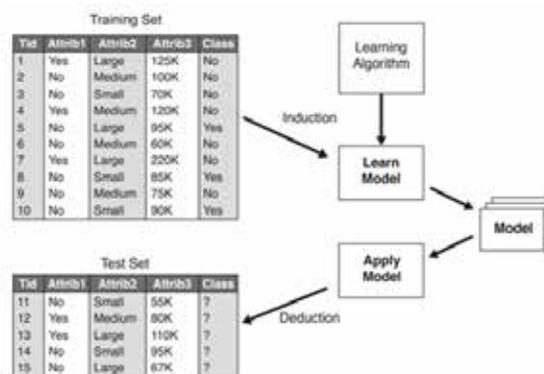


Fig 2. General Approach for Building a Classification Model

2.1.1 Naive Bayes Classification

In Bayesian classification there is a hypothesis that the given data belongs to a particular class. Then calculate the probability for the hypothesis of being true. This is among the most practical approaches for certain types of problems. The approach requires only one scan of the whole data.

The Bayes theorem is,

$$P(A/B) = \frac{P(B/A).P(A)}{P(B)}$$

P(B)

Where P(A) refers to the probability that event A will occurs .

P(A/B) stands for the probability that event A will happen, given that event B has already happened. The Naive Bayes classifier exploits the Bayes's rule and assumes independence of attributes.

It assigns an instance S_k with attribute values $(A_1=v_1, A_2=v_2, \dots, A_m=v_m)$ with maximum Prob $(C_i / (v_1, v_2, \dots, v_m))$ for all i.

For example the probability of assigning to class C_i and C_j is calculated for an instance S_k belonging to C_i

Likelihood of S_k belonging to C_i

$$\text{Prob}(C_i / (v_1, v_2, \dots, v_m)) = \frac{P((v_1, v_2, \dots, v_m / C_i)) \cdot P(C_i)}{P(v_1, v_2, \dots, v_m)}$$

Likelihood of S_k belonging to C_j

$$\text{Prob}(C_j / (v_1, v_2, \dots, v_m)) = \frac{P((v_1, v_2, \dots, v_m / C_j)) \cdot P(C_j)}{P(v_1, v_2, \dots, v_m)}$$

Therefore, when comparing $\text{Prob}(C_i / (v_1, v_2, \dots, v_m))$ and $\text{Prob}(C_j / (v_1, v_2, \dots, v_m))$ we

only need to compute $P((v_1, v_2, \dots, v_m / C_i)) \cdot P(C_i)$ and $P((v_1, v_2, \dots, v_m / C_j)) \cdot P(C_j)$

Under the assumption of independent attributes,

Furthermore,

$$P(C_i) = \frac{\text{no:training sample belonging to } C_i}{\text{total no:of training samples}}$$

All the probabilities are calculated using the data of training dataset.

2.1.2 Decision Tree

A decision tree is a popular classification method that generates tree structure where each node denotes a test on an attribute value and each branch represents an outcome of the test. The tree leaves represent the classes. This technique is fast unless the training data is very large. It does not make any assumptions about the probability distribution of the attributes value. The process of building the tree is called induction.

2.1.2.1 Building a Decision Tree

The decision tree algorithm is a top-down greedy algorithm which aims to build a tree that has leaves as homogenous as possible. The major step in the algorithm is to continue dividing leaves that are not homogeneous into leaves that are as homogeneous as possible until no further division is possible. The algorithm is described below

1. If some of the attributes are continuous-valued, they should be discretized into categories.
2. If all instances in training dataset are in the same class, then stop.
3. Split the next node by selecting an attribute from the independent attributes that best divides the objects in the node into subsets and create decision tree node.
4. Split the node according to the value of attribute selected in step 3.
5. Stop if any of the following conditions meets, otherwise continue step 3:
 - (a) If this partition divides the data into subsets that belong to a single class and no more node needs splitting
 - (b) If there are no remaining attributes for further division.

The major step in the decision tree building algorithm is Step 3, where an attribute that best splits the data needs to be selected.

The discriminatory power of each attribute is evaluated using following rules:

- 1) Rules based on Information Gain
- 2) Measure Rules based on Gini Index

2.1.2.2 Information Gain Measure

Information also known as entropy measures the lack of order in a system. The information of a data set S with m classes is defined as,

$$I = \sum_{k=1}^m P_k \log_2 P_k$$

where P_k is the relative frequency of class k.

The attribute with the highest information gain is selected.

2.1.2.3 Gini's Index Measure

Gini's index is a ratio measure with values in the interval [0,1] used to measure the discriminatory power of rating systems. For a data set S with m distinct classes, the simple Gini index is,

$$\text{Gini}(S) = 1 - \sum_{k=1}^m P_k^2$$

where P_k is the probability that an item belongs to class k (P_k is the relative frequency of class k). When the number of classes is large, some of the P_k can be small. The maximum of $\text{Gini}(S)$ occurs when each of the probabilities are equal with maximum value $1 - (1/m)$. The minimum occurs when all instances belong to the same class, with minimum value 0.

If the set S has a large number of classes, it can be computed recursively as follows. If S is partitioned into two disjoint subsets $S = S_1 \cup S_2$, the Gini index can be found as

$$\text{Gini}(S) = (n_1/n)\text{Gini}(S_1) + (n_2/n)\text{Gini}(S_2)$$

The attribute that provide the minimum Gini index is chosen for splits. Gini index is used to identify the attribute that best splits the data.

2.1.3 Support Vector Machine

An SVM classifies data by finding the best hyperplane that separates all data points of one class from those of the other class. The best hyperplane for an SVM means the one with the largest margin between the two classes. An SVM classifies data by finding the best hyperplane that separates all data points of one class from those of the other class. The support vectors are the data points that are closest to the separating hyperplane. The Figure 3 illustrates linear classification, with + indicating data points of type 1, and indicating data points of type 0. The datasets that are used cannot be classified using linear classifier. So, non-linear classifier with Gaussian kernel is used. The implementation of SVM is done on Matlab.

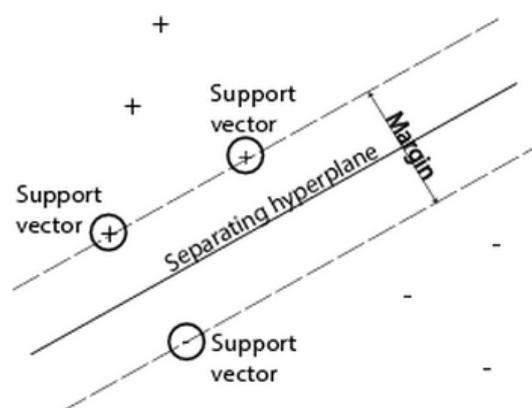


Fig 3. Support Vector Machine classification for 2 dimensional data

III. CONCLUSIONS

In this paper, various techniques for classifying profiles are proposed and this can be used as a framework with which automatic detection of fake profiles is possible with a very high efficiency as high as around 95%. This paper discuss classification techniques like Support Vector Machine, Naive Bayes and Decision trees to classify the profiles into fake or genuine classes. It can be applied easily by online social networks which has millions of profile whose profiles cannot be examined manually.

IV. ACKNOWLEDGMENT

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TILTING TRAIN TECHNOLOGY

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ABSTRACT

As a train goes into a curve, it produces substantial centrifugal force towards the outside of the curve. By tilting the train, this centrifugal force is balanced by a force into the inner curve and passenger discomfort is reduced. Modern tilting trains allow operators to achieve higher speeds on existing curved routes without costly track improvements or the need to consider completely new high speed lines. Signals from an accelerometer that measures train speed and curvature are analyzed by a computer, which tilts the individual cars as the first car goes onto the curve.

Keywords: *Accelerometer, Centrifugal Force, Curve, Higher speeds, Passenger discomfort, Tilting*

I. INTRODUCTION

A train and its passengers are subjected to lateral forces when the train passes horizontal curves. Car body roll inwards, however, reduces the lateral acceleration felt by the passengers, allowing the train to negotiate curves at higher speed with maintained ride comfort [1]. Trains capable of tilting the car bodies inwards in curves are called *tilting trains*. Tilting trains can be divided in two groups: the *naturally tilted trains* and the *actively tilted trains*. *Natural tilt* relies on physical laws with a tilt center located well above the Center of gravity of the car body. In a curve, under the influence of lateral acceleration, the lower part of the car body then swings outwards. *Active tilt* may have car body center of gravity and rotation center at about the same height. This form of tilt does not normally have an impact on the safety of the train, since the center of gravity does not essentially change its (lateral) position. Active tilt relies upon control technology involving sensors and electronics and is executed by an actuator, usually hydraulic or electric, without actuation there is no significant tilt action.



Fig. 1 tilting train

The first tilting train in regular public service was the 381 series electric multiple unit train operated by Japanese National Railways (JNR), which entered revenue service from 10 July 1973 on the Shinano limited express between Nagoya and Nagano on the Chūō Main Line. This technology was not fully implemented worldwide, as

the marginally increased curve speeds did not justify the extra expense and technology in many cases. The British Advanced Passenger Train (being operational from 1984 to 1985) was the first to successfully implement active tilt, enabling significantly increased speeds on tight rail curves. Active tilting is the mechanism most widely used today.

II. HISTORY

The first considerations and experiments to reduce the lateral force felt by the passengers and thereby allow higher speeds in curves date back to the late 1930s, Deischl and Van Dorn & Beemer. In 1938, Pullman built an experimental pendulum coach for the Atchison, Topeka and Santa Fe Railway which became the first tilting coach in service. The novel designs were based on natural tilt [2]. The first series of tilting trains were the Japanese class 381, which entered service between Nagoya and Nagano in 1973. Active technology was introduced in 1965 when Deutsche Bahn (DB) converted a diesel multiple unit series 624 for tilt, the first actively tilted train in commercial service. One important development chain for actively tilting trains was the development of the Pendolino trains, which began in 1969 with a prototype tilting railcar, the Y0160. The break-through for actively tilted trains came around 1990 with the introduction of large series commercial trains, like the ETR450 in Italy and the X2 in Sweden. In 2007 the Shinkansen Series N700 became the first tilting train with a maximum speed above 250 km/h in service.



Fig.2 An ICE TD in regular service in 2002

Deutsche Bahn started tests with tilting trains in Germany with its class 634 in 1967 when some class 624 DMUs were equipped with passive tilting systems. As the passengers experienced motion sickness, the tilting technology was disabled and later removed. The tests continued with the prototypes of the following class 614 units, but due to the again unsatisfying results the serial types were delivered without tilting system.

Another early train with tilting technology was Deutsche Bahn's class 403 (today this number is used by ICE 3) high speed EMU. Following its InterCity services until 1979, it was also used for airport transfers between Düsseldorf and Frankfurt (see also: AiRail Service). Class 403 was able to tilt 4° , but the fixed pantographs limited this to 2° . Shortly after the train had gone into service the tilting technology was disabled as many passengers experienced motion sickness because the pivotal point was too low.

The next attempt was made with DMUs and the well proven Italian hydraulic active tilting system. Between 1988 and 1990 DB commissioned 20 class 610 units for fast regional traffic. This time the results were quite satisfying and allowed a significant reduction of running times. Class 610 was followed by class 611 which basically was built for the same purpose (fast regional traffic with up to 160 km/h (99 mph) on twisting non-electrified lines). Class 611's tilting system was electric, with a maximum 8° tilt, based on military technology from the Leopard tank. However, after coming into service in 1996 this 50-unit class experienced problems both with the newly developed tilting system as well as chassis and axles, so it was judged not successful. The tilting

system was out of service until 2006, when hardened axles and system updates finally solved the problems. In consideration of these problems DB ordered a full re-engineering, resulting in the development of class 612. Starting in 1998, a total of 192 units were commissioned by DB.

The tilting system was reliable, but when in 2004 cracks were detected in a number of wheel sets, again wheels and axles had to be replaced. Today class 612 is back to tilting operation and forms the backbone of DB's fast regional service on non-electrified lines. Additional units were sold to Croatia, where they are used for intercity services.

III. PRINCIPLE

“The basic principle of tilting trains is to roll the car body inwards during curve negotiation in order to reduce the lateral acceleration perceived by the passengers”.

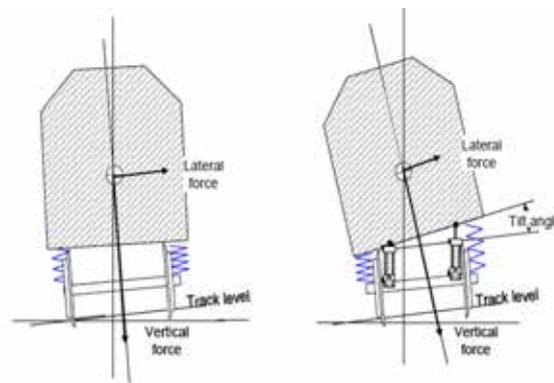


Fig.3 Working Principle of Tilting train

A train and its passengers are subject to centrifugal forces when the train passes horizontal curves. Roll inwards reduces the centrifugal force felt by the passengers allowing the train to pass curves at enhanced speed with maintained ride comfort. Trains capable to tilt the bodies inwards is often called tilting trains. The tilting trains can be divided in two groups; the natural tilted trains, and the actively tilted trains.

The natural tilt relies on natural laws with a tilt center located well above the center of gravity of the car body. On a curve, under the influence of centrifugal force, the lower part of the car body swings outwards [4]. It should be noted that natural tilt has a negative impact on safety due to the lateral shift of center of gravity of the car body.

The active tilt relies on active technology, controlled by a controller and executed by an actuator. The basic concept of tilting trains is the roll of the vehicle bodies inwards the curve in order to reduce the lateral force perceived by the passenger.

IV. WORKING

Fig.4. shows how this solution is applied to control natural tilt. An on board computer stores data and the location of the curves. The control system is able to start the tilting motion before entering the curves by means of preview control using the on board database [5]. This reduces the tilting delay significantly and thereby also the low-frequency lateral acceleration that may otherwise cause motion sickness in sensitive passengers.

Modern tilting trains are profiting from state-of-the-art signal processing which senses the line ahead and is able to predict optimal control signals for the individual carriages. Complaints about nausea have by and large become a thing of the past.

Some tilting trains run on narrow gauge railways. In Japan there are many narrow gauge lines in mountainous regions, and tilting trains have been designed to run on these. In Australia the service between Brisbane and Cairns by the QR Tilt Train claims to be the fastest narrow-gauge train in the world, running at 160 km/h (99 mph).

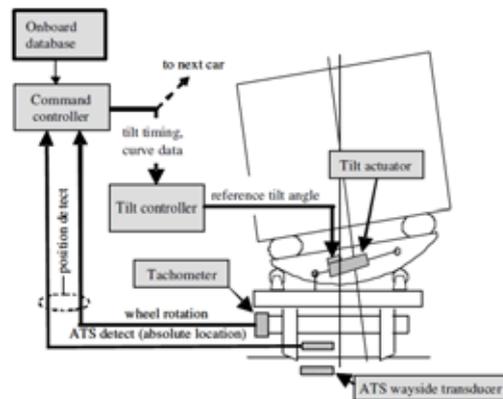


Fig.4 Structure of controlled natural tilting

IV. TILTING TRAIN AROUND THE WORLD

1. Acela Express (United States), a Bombardier-built high-speed tilting train operating between Boston and Washington, D.C.
2. Advanced Passenger Train (United Kingdom), a British Rail project for high-speed inter-city tilting trains that saw limited service in the 1980s, from London Euston to Glasgow.
3. British Rail Class 390 "Pendolino" (United Kingdom), a high-speed train runs by Virgin Trains from London Euston to Liverpool/ Manchester / Glasgow / Birmingham and Wolver Hampton.
4. Alfa Pendular (Portugal)
5. ElettroTreno (Italy)
6. ICE-T, also called ICT (Germany), a tilting version of the ICE
7. ICN (Switzerland), a new generation of tilting trains operated by Swiss Rail, a Bombardier-built high-speed tilting train operating between Zurich and Geneva.
8. Jet Train (North America), Bombardier's experimental non-electric high-speed train
9. NSB Class 73 (Norway)
10. SŽ series 310 (Inter City Slovenija), a high-speed tilting train operating between Ljubljana, Maribor and Koper

V. FUTURE SCOPE

The attempt to find the sources, and their relative contributions, of motion sickness in the present work was not so successful and it is unlikely that any simple answer exists. It is probably more worthwhile to work on tilt control, which is evolving strongly. The improved tilt control as such will be further developed by the train

suppliers; this will be beneficial for both ride comfort and reduction of the risk of motion sickness. It is likely that independent research organisations, such as universities, can contribute to further optimization of the tilt algorithms. Naturally tilting trains in Japan. This development was forced by requirements concerning ride comfort and low risk of motion sickness. Knowing the train position is the key to perfect tilt control. In the on-track test that concluded the present work the design took advantage of global positioning systems to obtain the absolute position and dead reckoning to find the relative position with reference to the last absolute position given. Train position and track data information constitutes a good basis for an advanced tilt control, which is a good match to some of the means to reduce the risk for motion sickness suggested below.

Improving the performance of the tilting trains will in the present network increase the speed relative to other trains on the network. On double-track lines this will be negative for the line capacity and building a new line becomes an alternative when the present line is close to its maximum capacity. For services with short distances between stops, improved tractive performance may be a better choice than tilt.

The influence on average ride comfort from increased speed and cant deficiency compared to today's trains can be compensated by improved vehicle suspension. The influence on curve related quantities, such as lateral acceleration and lateral jerk, can be compensated by tilt but possibly at the expense of increased vertical and roll motions.

VI. CONCLUSION

Car body tilting has today become a mature technology accepted by most operators. There are different reasons behind this fact; the non-tilting trains have increased their speed in curves (however at a reduced level of ride comfort), reducing the potential for travelling time reduction by tilting trains to approximately 10 to 15%. Reduction of motion sickness may be important for the competitiveness of tilting trains and comfort too. This thesis has dealt with subjects important for improving the competitiveness of tilting trains compared to non-tilting ones this work has contributed to the body of knowledge of tilting trains and this chapter presents the overall conclusions.

Tilting trains can be divided into two groups, depending on whether active force is needed to create tilt or not, called actively tilted trains and naturally tilting trains. However, many of today's naturally tilting trains do have an active system to improve control of the tilt motion. As early as the late 1980s control systems utilizing wayside information was introduced in

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A REVIEW ON HYPERSONIC AIRCRAFT

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ABSTRACT

The ultimate objective of making the world smaller place and being able to fly to any point in just couple of hours which can be possible with "hypersonic aircraft". This is aircraft moves with 7 times more than the speed of the sound i.e. (7 Mach). This aircraft uses air breathing type supersonic ramjet (scramjet) engine. having speed near about 7700 km/hr. nasa's x-43 (hyper-x) is one of the hypersonic aircraft, which is construct with tile based thermal protection system, carbon-carbon composites and high temperature resistance metal with gaseous hydrogen fuel in engine. This aircraft is carried out by booster rocket up to its test altitude of 100000 ft. where it separates from the booster and files under pre-programmed control system.

Keywords: Booster rocket, Hydrogen fuel, Supersonic ramjet, Thermal protection.

I. INTRODUCTION

Emerging hypersonic air breathing propulsion systems offer the potential to enable new classes of flight vehicles that allow rapid response at long range, more Manoeuvrable flight, better survivability, and routine and assured access to space. Historically, rocket boosters have been used to propel hypersonic vehicles (i.e., those flying faster than 5 times the local speed of sound) for applications such as space launch, long-range ballistic flight, and air-defence interceptor missiles. Air breathing propulsion systems currently under development will provide a means for sustained and accelerating flight within the atmosphere at hypersonic speeds. Potential mission areas include long-range cruise missiles for attack of time-sensitive targets, flexible high-altitude atmospheric interceptors, responsive hypersonic aircraft for global payload delivery, and reusable launch vehicles for efficient space access. Although hypersonic air breathing propulsion systems have been investigated for the past 40 years without development of an operational system, significant technology advancements have been realized recently, and the development of operational hypersonic systems appears to be within our grasp. In particular, the technology to support a baseline hypersonic propulsion system exists that will allow operation at speeds up to Mach 6 with conventional liquid hydrocarbon fuels.[1]

II. HISTORY

During World War II, a tremendous amount of time and effort were put into researching high-speed jet- and rocket-powered aircraft, predominantly by the Germans. After the war, the US and UK took in several German scientists and military technologies through Operation Paperclip to begin putting more emphasis on their own weapons development, including jet engines. The Bell X-1 attained supersonic flight in 1947 and, by the early 1960s, rapid progress towards faster aircraft suggested that operational aircraft would be flying at

"hypersonic" speeds within a few years. Except for specialized rocket research vehicles like the North American X-15 and other rocket-powered spacecraft, aircraft top speeds have remained level, generally in the range of Mach 1 to Mach 3.

In the 1950s and 1960s a variety of experimental scramjet engines were built and ground tested in the US and the UK. In 1964, Dr. Frederick S. Billig and Dr. Gordon L. Dugger submitted a patent application for a supersonic combustion ramjet based on Billig's Ph.D. thesis. This patent was issued in 1981 following the removal of an order of secrecy. In 1981 tests were made in Australia under the guidance of Professor Ray Stalker in the T3 ground test facility at ANU.

The first successful flight test of a Scramjet was performed by Russia in 1991. It was an axisymmetric hydrogen-fuelled dual-mode scramjet developed by Central Institute of Aviation Motors (CIAM), Moscow in the late 1970s. The scramjet flight was flown captive-carry atop the SA-5 surface-to-air missile that included an experiment flight support unit known as the "Hypersonic Flying Laboratory" (HFL), "Kholod".[2] Then from 1992 to 1998 an additional 6 flight tests of the axisymmetric high-speed scramjet-demonstrator were conducted by CIAM together with France and then with NASA, USA.[3] Maximum flight velocity greater than Mach 6.4 was achieved and Scramjet operation during 77 seconds was demonstrated. These flight test series also provided insight into autonomous hypersonic flight controls.



Fig.1 NASA X-43with scramjet attached to the underside

In the 2000s, significant progress was made in the development of hypersonic technology, particularly in the field of scramjet engines. The HyShot project demonstrated scramjet combustion on July 30, 2002. The scramjet engine worked effectively and demonstrated supersonic combustion in action. However, the engine was not designed to provide thrust to propel a craft. It was designed more or less as a technology demonstrator.

A joint British and Australian team from UK defence company QinetiQ and the University of Queensland were the first group to demonstrate a scramjet working in an atmospheric test. US efforts are probably the best funded, and the Hyper-X team claimed the first flight of a thrust-producing scramjet-powered vehicle with full aerodynamic manoeuvring surfaces in 2004 with the X-43A. On Friday, June 15, 2007, the US Defence Advanced Research Project Agency (DARPA), in cooperation with the Australian Defence Science and Technology Organisation (DSTO), announced a successful scramjet flight at Mach 10 using rocket engines to boost the test vehicle to hypersonic speeds. A series of scramjet ground tests was completed at NASA Langley Arc-Heated Scramjet Test Facility (AHSTF) at simulated Mach 8 flight conditions. These experiments were used to support HI Fire flight 2.

On May 22, 2009, Woomera hosted the first successful test flight of a hypersonic aircraft in HIFiRE. The launch was one of 10 planned test flights. The series of up to 10 planned hypersonic flight experiments is part of a joint research program between the Defence Science and Technology Organisation and the US Air Force, designated

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as the Hypersonic International Flight Research Experimentation (HIFiRE).[4] HIFiRE is investigating hypersonics technology (the study of flight exceeding five times the speed of sound) and its application to advanced scramjet-powered space launch vehicles — the objective is to support the new Boeing X-51 scramjet demonstrator while also building a strong base of flight test data for quick-reaction space launch development and hypersonic "quick-strike" weapons.

On May 27, 2010, NASA and the United States Air Force successfully flew the X-51A Waverider for approximately 200 seconds at Mach 5, setting a new world record hypersonic airspeed. The Waverider flew autonomously before losing acceleration for an unknown reason and destroying itself as planned. The test was declared a success. The X-51A was carried aboard a B-52, accelerated to Mach 4.5 via a solid rocket booster, and then ignited the Pratt & Whitney Rocketdyne scramjet engine to reach Mach 5 at 70,000 feet. However, a second flight June 13, 2011 was ended prematurely when the engine lit briefly on ethylene but failed to transition to its primary JP7 fuel, failing to reach full power.

On 16 November 2010, Australian scientists successfully demonstrated that the high-speed flow in a naturally non-burning scramjet engine can be ignited using a pulsed laser source. A further X-51A Waverider test failed on August 15, 2012. The attempt to fly the Scramjet, carried by a B-52 for a prolonged period at Mach 6 was cut short when, only 15 seconds into the unmanned flight, the X-51A craft lost control and broke apart, falling into the Pacific Ocean north-west of Los Angeles. The cause of the failure was blamed on a faulty control fin. In May 2013 an unmanned X-51A WaveRider reached 4828 km/h (Mach 5.1) during a three-minute flight under scramjet power. The WaveRider was dropped at 50,000 feet from a B-52 bomber, and then accelerated to Mach 4.8 by a solid rocket booster which then separated before the WaveRider's scramjet engine came into effect.

III. WORKING

The booster rocket carries X-43A up its altitude of 1,00,000ft where the X-43A vehicle separates from the booster and flies under the power and control of its own built-in engineer and pre-programmed control system.

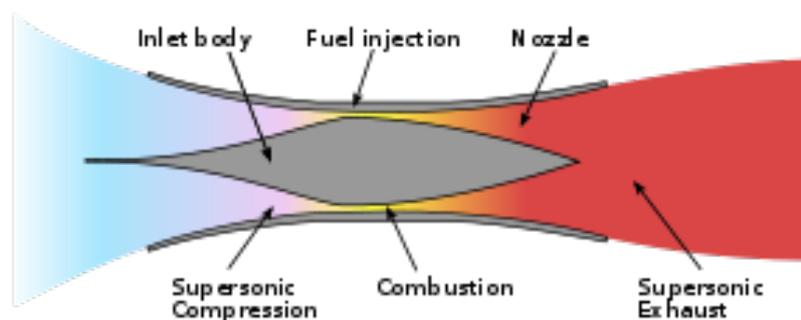


Fig.2 Scramjet engine

The X-43A vehicle separates from the booster rocket by the activation of two small pistons. Immediately after separation, the X-43A engine operates for just over ten seconds demonstrating forward thrust in flight. When the engine test is completed the vehicle is programmed to go into a high-speed glide which provides six minutes of aerodynamic data at hypersonic speed. The X-43A continues to a pre-programmed mission completion point in the Weapon's Division Sea Range managed by the Naval Air Warfare center and situated in the Pacific off the southern coast of California. NASA Dryden Flight Research Centre at Edwards, California is responsible for the manufacture and flight of three unpiloted X-43A research vehicles and also for the manufacture of the

expendable booster rockets for the launch of the X-43A vehicles. The flight data is used to evaluate the performance of the X-43A vehicles at speed of Mach 7 and Mach 10, and demonstrate the use of the air breathing engines. The flight from NASA Dryden continues over the Pacific Missile Test Range and returns to Dryden.[5]

- **Rundown of how the X-43A test flights work**

1. The X-43A is attached to Pegasus booster rocket.
2. The X-43A and booster rockets are carried up to about 20,000ft (6,096m) by a customized B-52 aircraft.
3. The B-52 releases the launch vehicle.
4. The booster rocket accelerates to a speed of somewhere between Mach 5 or faster and flies to an altitude of about 1,00,000 feet (30,480 m).
5. The X-43A separates from the booster rocket and flies under its own power and pre-programmed control.
6. The X-43A flies over the ocean for a few minutes before splashing down.

IV. MATERIALS FOR HYPERSONIC AIRCRAFT

- **Ceramics (High Temp 2000-3000 degree F)**

Ceramic offers a high temperature range. However, ceramics are not very strong. To compensate for their lack of strength ceramics are usually combined with some other material to form a ceramic composite. You can find these ceramic composites used in combustor and nozzle components.

- **Composites (All temperature)**

Composite materials offer great advantages over metals and ceramics. Not only are composites able to withstand very high temperature, they can also be lightweight. There are three main types of composite materials: polymer-matrix, metal-matrix, ceramic-matrix.

1. **Polymer Matrix Composites (PMC)**

Polymer materials tend to degrade when exposed to elevated temperatures. Most PMCs operate at temperatures below 570 degree F.

2. **Metallic Matrix Composites (MMC)**

Offer not only very high temperature limits, but also increased toughness and strength against ductility. These MMCs are often used on the skin of a hypersonic aircraft.

3. **Ceramic Matrix Composites (CMC)**

Allow for higher temperature inside the jet engine thus creating greater combustion efficiency (i.e. the higher the temperature, the more completely the fuel burns which leads to increased fuel efficiency and lower emissions.) CMCs major downfall is their brittleness.[6]

V. CONCLUSION

As SCRAMJET is required high compression for this it is powered by some external supply, for that it is attached with other airplane up to some height and releases. Scramjet can't start at rest. Considering this concept in future scramjet will use Mach 10-15. Due to this property it is used in Military operations.

In Hypersonic Aircraft dual mode engine that is Ramjet both are used. Hence it is very advantageous to use in Military applications. Also it is very good achievement for our scientist, for NASA people this research is a measure of success for their knowledge. Hence in today's competitive world the challenge comes in front of man is

“Need for speed-most wanted” so aircraft using this type of jet engine could dramatically reduce the time it takes to travel from one place to another, potentially putting any place on Earth within a 90 minute flight.

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FACILITATING DOCUMENT ANNOTATION USING METADATA

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ABSTRACT

A large number of organizations today generate and share textual descriptions of their products, services, and actions. Collections of textual data contain significant amount of structured information, which remains buried in the unstructured text. While information extraction algorithms facilitate the extraction of structured relations, they are often expensive and inaccurate, especially when operating on top of text that does not contain any instances of the targeted structured information. I present a novel alternative approach that facilitates the generation of the structured metadata by identifying documents that are likely to contain information of interest and this information is going to be subsequently useful for querying the database. Identify the metadata when such information actually exists in the document, instead of naively prompting users to. As a major contribution of I present a algorithm that identify structured attributes that are likely to appear within the document, by jointly utilizing the content of the text and the query workload. That our approach generates superior results compared to approaches that rely only on the textual content or only on the query workload, to identify attributes of interest.

Keyword: *CAD Platform, Coordinate Matching, Information Extraction, Keyword Search, Metadata.*

I. INTRODUCTION

Clustering algorithms are typically used for exploratory data analysis, where there is little or no prior knowledge about the data. This is precisely the case in several applications of *Computer Forensics*, including the one addressed in our work. From a more technical viewpoint, our datasets consist of unlabeled objects the classes or categories of documents that can be found are *a priori* unknown. Moreover, even assuming that labeled datasets could be available from previous analyses, there is almost no hope that the same classes would be still valid for the upcoming data, obtained from other computers and associated to different investigation processes. More precisely, it is likely that the new data sample would come from a different population. In this context, the use of clustering algorithms, which are capable of finding latent patterns from text documents found in seized computers, can enhance the analysis performed by the expert examiner.

The rationale behind clustering algorithms is that objects within a valid cluster are more similar to each other than they are to objects belonging to a different cluster. Thus, once a data partition has been induced from data, the expert examiner might initially focus on reviewing Representative documents from the obtained set of clusters. Then, after

this preliminary analysis, it may eventually decide to scrutinize other documents from each cluster. By doing so, one can avoid the hard task of examining all the documents but, even if so desired, it still could be done.

In a more practical and realistic scenario, domain experts are scarce and have limited time available for performing examinations. Thus, it is reasonable to assume that, after finding a relevant document, the examiner could prioritize the analysis of other documents belonging to the cluster of interest, because it is likely that these are also relevant to the investigation.

Clustering algorithms have been studied for decades, and the literature on the subject is huge. Therefore decided to choose a set of representative algorithms in order to show the potential of the proposed approach, namely: the partition K-means and K-melodies. Thus, as a contribution of our work, we compare their relative performances on the studied application domain using five real-world investigation cases conducted by the Brazilian Federal Police Department. In order to make the comparative analysis of the algorithms more realistic, two relative validity indexes have been used to estimate the number of clusters automatically from data.

II. LITERATURE SURVEY

2.1. Facilitating Document Annotation Using And Querying Value:

- ✓ In this paper propose CADS (Collaborative Adaptive Data Sharing platform).
- ✓ Which is an “annotate-as-you-create” infrastructure that facilitates fielded data annotation?
- ✓ A key contribution of our system is the direct use of the query workload to direct the annotation process, in addition to examining the content of the document.
- ✓ In other words are trying to prioritize the annotation of documents towards generating attribute values for attributes that are often used by querying users.

2.1.1 Disadvantage

- ✓ Unavailability of proper information to different levels of query.” Coordinate matching” by inner product similarity.
- ✓ It does not provide more accurate data only get the files from only exact name required.
- ✓ Unavailability of proper information rarely differentiates the search results.

2.2. Towards a Business Continuity Information Network for Rapid Disaster Recovery

Most of the recent work has been conducted for crisis management under terrorist attacks and emergency management services under natural disasters with private business continuity and disaster recovery a secondary concern. In this paper, we propose a model for pre-disaster preparation and post-disaster business continuity/rapid recovery. The model is utilized to design and develop a web based prototype of our Business Continuity Information Network (BCIN) system facilitating collaboration among local, state, federal agencies and the business Community for rapid disaster recovery. We present our model and prototype with Hurricane Wilma as the case study.

2.2.1 Disadvantages

We then utilize our model for the implementation of a web based Business Continuity Information Network (BCIN) that creates a disaster management dataspacebased on the communication among the stakeholders and enables businesses, emergency management community and NGOs to effectively communicate, identify and assist in the execution of preparation and recovery plans; identify user relevant and location specific disaster preparation and recovery resources along with the business/employee loan and assistance programs facilitating intelligent decision support; and dynamically disseminate location and user specific information regarding key inhibitors to preparation and recovery process such as open/closure status of schools, businesses, transportation, roadways and emergency services etc.

III. SYSTEM ARCHITECTURE

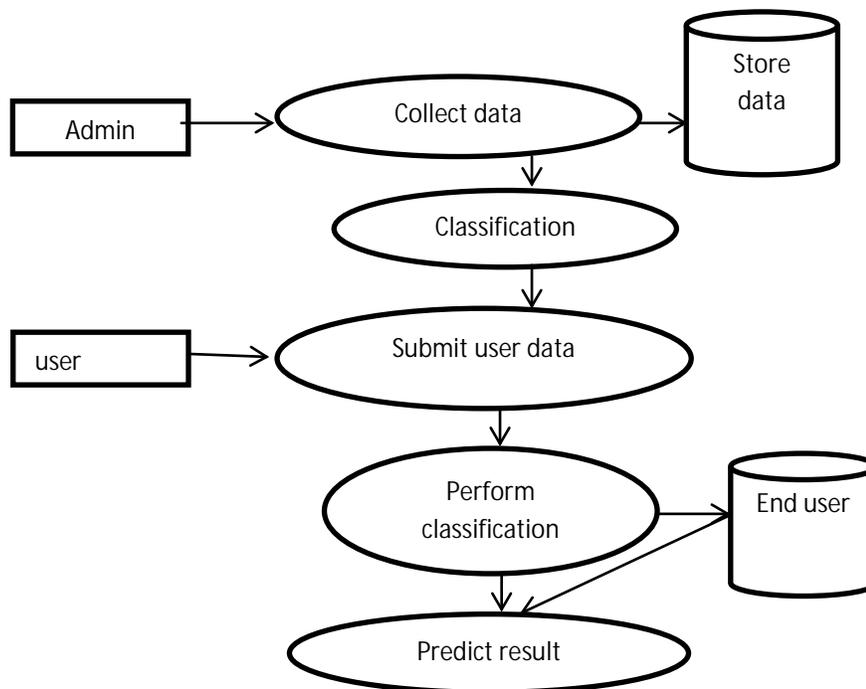


Figure: 3.1 System Architecture Diagram

IV.METHODOLOGY

4.1. Registration

In the registration phase the new user can register the details and get the service, if there is any new user they can create the new login id, in registration the new use must give full details about the name and other details. Finally they will get the user name and password.

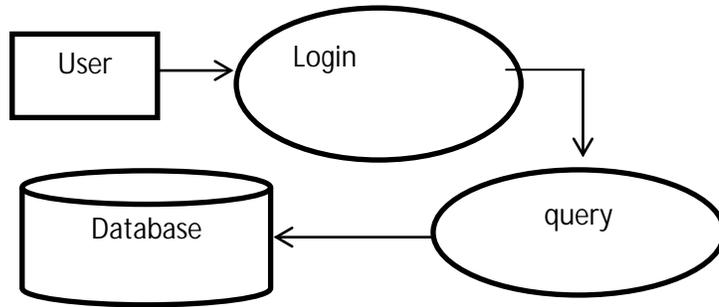


Figure: 4.1.1 Registration Diagram

4.2. Login

In this module, any of the above mentioned person have to login, they should login by giving their email id and password. This Module is a portal module that allows users to enter a User Name and Password to log. This Module displays a *username* and password Login form to perform authentication with user ID and password. If the user enters a valid username/password combination they will be granted access to additional resources on your website.

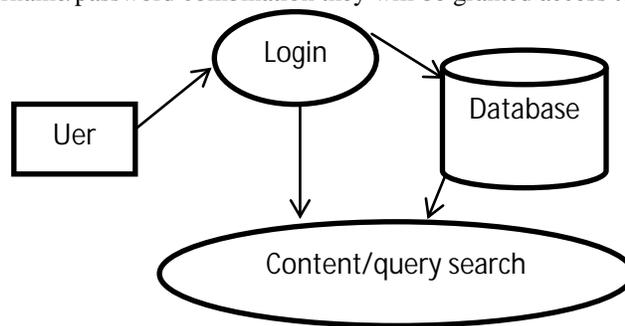


Figure: 4.2.1 Login Diagram

4.3. Document Upload

In this module Owner uploads an unstructured document as file (along with Meta data) into database, with the help of this metadata and its contents, the end user has to download the file. It has to enter content/query for download the file.

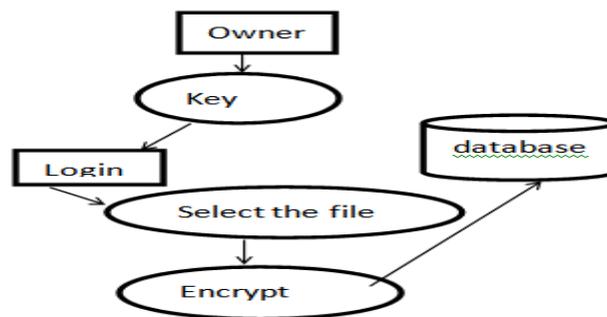


Figure: 4.3.1.Document upload

4.4. Search Techniques

Here we are using two techniques for searching the document

- 1) Content Search,
- 2) Query Search.

4.4.1 Content Search

It means that the document will be downloaded by giving the content which is present in the corresponding document. If its present the corresponding document will be downloaded, otherwise it won't.

4.4.2. Query Search

It means that the document will be downloaded by using query which has given in the project. If its input matches the document will get download otherwise it won't.

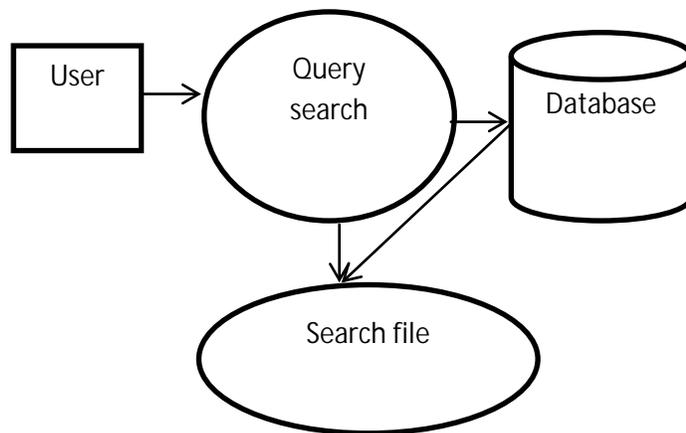


Figure: 4.4.1.Search Technique

4.5. Download Document

User has to download the document using query/content values which have given in the base paper. It enters the correct data in the text boxes, if it's correct it will download the file. Otherwise it won't.

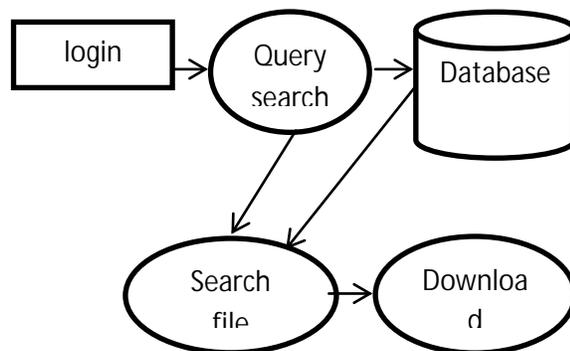


Figure: 4.5.1 Download Document

IV. CONCLUSION AND FUTURE WORK

The adaptive techniques to suggest relevant attributes to annotate a document, while trying to satisfy the user querying needs. Our solution is based on a probabilistic framework that considers the evidence in the document content and the query workload. We present two ways to combine these two pieces of evidence, content value and querying value: a model that considers both components conditionally independent and a linear weighted model. Experiments show that using our techniques, we can suggest attributes that improve the visibility of the documents with respect to the query workload by up to 50%. That is, we show that using the query workload can greatly improve the annotation process and increase the utility of shared data. In Future, The form contains the best attribute names given the document text and the information need (query workload), and the most probable attribute values given the document text. The author (creator) can inspect the form, modify the generated metadata as necessary, and submit the annotated document for storage. Our efforts focus not only on identifying the potential annotations fields that exist in complete and optimal annotations for document, but also to rank them and display on top the most important ones. Since the goal of annotations is to facilitate future querying, we want the annotation effort to focus on generating annotations useful for the queries in the query workload.

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BIOGRPHY

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TALENTED WAYS TO FABRICATE YOUR DIGITAL REPUTATION VIA SOCIAL MEDIA

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ABSTRACT

The talented fresh society is manipulating major control above the insights of trade names and businesses, mainly determined with the quick development of social media pathways throughout which influencers correspond. The “insignificant persons” of the history is currently the fresh “significant persons” challenging the concentration of communication experts who look for constant commitment with targeted customers all the way through the variety of stream of the social network. The principle of this manuscript is towards presenting a way of recognizing these bright “significant people”. This paper focuses the requirement for digital identity as well as the use of this manuscript is to enlarge and enhance the accepting coverage of social networking. It also wants to train business judgment planners, IT, knowledge employees regarding the different benefits, function, possibility and applications connected by means of social networking.

The paper covers certain part which are social media, gain knowledge, build up content, build relations, pay attention, organize & supervise, respect the strength of the web and share the prosperity and also talk about the exclusive participation that innovative exercises similar to practice of social media in human resources (HR) cooperate to form this upcoming schedule. To illustrate the finest among the fresh, the report things to see several illustration that have implemented along with effectively expand from these new practice.

Keywords : Build Relations, Gain Knowledge, Pay Attention, Social Media, Supervise and Organize.

I. INTRODUCTION

Social media has given us vast ways for protecting and building our digital reputations. Nowadays we have the ease of searching conversations, and also the ability to set alerts to help us for monitoring our names which give us the constant availability of learning opportunities and more ways to communicate and interact with others. All these tools, were not available just a few years ago, but with the arrival of these tools, make it possible for us to be proactive in maintaining, building and protecting our good name and brand value.

Social networking Web sites are these days measured the most well-liked Web sites on top of the Internet. They offer wide ways of communication plus individual networking considering job seekers by improved opportunities to network. Furthermore, they emerge to live a progressively more valuable tool designed for human resource management experts to promote job openings in addition to search for information concerning job seekers in a well-organized and commercial mode. The extensive utilize of the Internet in job hunt along with employee staffing should not arrive as a shock. Generally job seekers as well as human resource proficient's utilize social sites now-a-days widely (Stopfer & Gosling, 2013)[1], since established with a amount

of current editorial in the press (e.g., Manjoo, 2010)[2], and analysis contacted via specialized organizations (Chartered Institute of Personnel & Development, 2010)[3] and (Society for Human Resource Management, 2011)[4]. On the other hand, educational investigation has been uncertain to chase up and discover subject connected towards the exercise of social networking sites through a little exemptions, which will be consider consequently. Hence, the endeavour of the present manuscript is double: to discover the practice of social media via job seekers throughout their job hunt actions and with human resource experts throughout the hiring procedure.

According to a review quoted by(Brotherton, 2012)[5], almost two-thirds of manager surveyed in the U.S. had profitably created goodwill of the company via social networks along with 64 percent reported that they recruited employees with the help of social media in 2011 which is compared with 58 percent in 2010.most of the organization utilizing social media for reputation management.

II. DIGITAL REPUTATION

Reputation is a particularly flowing, contingent, and precarious personal attribute generated entirely by the perception, attention and approval of others. As detractor John Rodden disagrees, constructing a reputation engages a partial procedure of ‘image-building’ along with awareness organization, as such, is never specified once and for all (Rodden, 2006: 75)[6]. Obtaining a reputation ask for the problem, ‘reputation for what?’ The respond in favour of which is predicated on an entire crowd of extremely variable contextual with institutional aspects. Though traditionally reputation have been supposed to be a direct indication of the intrinsic feature of a person’s effort or attainment, these days the attainment of reputation tolerates extremely little relation to any definite talent or achievement, however come out to be imitative solely from the act of effective attention-getting itself, by any means necessary (Rodden, 2006: 80)[6], including expressing feelings and opinions online. Of course, any notion of the ‘inherent quality’ of a person’s achievement is an historical and cultural construction, as, indeed, is reputation itself. A ‘reputation’ is habituated and, debatably, represented by cultural plus financial organizations that have the power to authorize and straight concentration, with transform so as to notice flipside into worth. In other style, reputation is an inspiring conception, moreover, as such is trained with its method of fabrication. This method of fabrication is usually noticeable through the perennially exploitative relations between labour and capital as well as by other relations of power based on forms of personality such as contest, sexuality and masculinity. At the end, what is created in the shape of a reputation certainly exceeds the control of those individuals who generate it or the individual who must ‘carry’ it; typically, we are ‘subjected to’ a reputation. since women well recognize, including born the trouble of what Linda Williams has called a ‘surplus A aestheticism for centuries (1999: 41), visibility and the reputation that follows from it is, most often, a trap (Foucault, 1977)[7]. Numerous include disputes that this supremacy of approval as well as authorizing concentration, these days principally performed via the social media businesses, which can direct to the expansion of a advantageous reputation, support the requirement in all persons, exceptional, concurrently, to identify our exceptionality and moderate our anomie. since Leo Braudy have prominently on paper, reputation and celebrity are, at least indirectly, noticeable by contradiction - between distinctiveness along with acceptance, diversity and cohesions, and mainly of all, the need for intelligibility among what one truly is ‘inside’ and what others see and rejoice (Braudy,1997)[8]. Consequently as we cooperatively create as well as shatter reputations through the method of appealing in, or maintaining, recognition by way of others, the increase of the

concentration or 'reputation' economy online can be read as a social symptom - evidence of a significant shift in modalities of the 'self' in the West.

III. TALENTED WAYS TO FABRICATE DIGITAL REPUTATION IN A STRUCTURED MANNER

There are various tools and resources now, which can help us to become better communicators and better guardians of our status. I know it is a huge responsibility, but the issue to ask yourself is: If you are not spending in yourself, then why should anybody else?

3.1 Establish Objectives

As I am sure you must have made this previously, but just in case if you don't, then first do a search on Google for your name in quotation marks. What is important to see what comes up on the first page? This first page of a Google search result is precious and it is the one which actually matters. After then set up a simple spreadsheet so that you can track and analyse your digital footprint. In addition do a little research and spend some time in collecting data's and numbers. How many follows you on Facebook and Twitter? What kind of traffic do you get on your site? Once you have the numbers, it becomes easy for you to decide your goals. Another question that arises, Are you interested in growing the numbers of links/connections/followers or do you want more one-on-one meeting? Or are you extra paying attention in attaining tweets on Twitter. When you place your objectives, follow the grades in the spreadsheet and make adjustment as needed.

3.2 Gain Knowledge

To accomplish any of these goals successfully, you need to learn. New world of communication is developing quickly, and it naturally lends to various advantages. Firstly, there is a lot of room for experimentation, where you can use your talents and skills to communicate in your own unique way. Secondly, this experimentation has led to collaboration of different ideas, and smart and intelligent people are sharing information all the time. Every day you should make sure that you will give time for "learning." Look over the sites and information to match up with the developments in social media.

3.3 Build Up Content

In order to converse 24/7, which is nowadays the hope plus the standard, you required to build up diverse kind of contented. Blogging is a grand mode to split your information and interrelate with others. However, blogging can be a huge responsibility. Blogging professional [Denise Wakeman](#) advise that you blog 3 times a week. If that is extreme job for you, to make an effort as a guest blogging on an recognized site or blog in your business. A new way that some of my patrons have established content in the course of books, audio recordings, e-books, videos and slide presentations.

3.4 Build Relations

Constructing and maintaining relations has never been easier. Those of us who are in sales and marketing have always known the value of connection constructing, but nowadays everybody wants to create it precedence. Make certain you have profiles on Facebook, LinkedIn and Twitter, which in general are a incredible foundation of information, as well as an brilliant place to gain knowledge. People on Twitter are willing and glad to share

every one. To acquire advice from efficient communication lying on these sites, Social media is absolutely a superb way to build relations, but don't overlook the worth of face to face conventions, emails, hand written notes, and phone calls. It's excellent to focus on significant customers and influencers, but there should be some room for the "accidental" connections. Social media networking can be amazing; you never know which person may lead you to a new connection or client.

3.5 Be Genuine

Authenticity is the secret ingredient behind any good and valuable social medium advertising procedure. If e-mail you know your audience, establish them online, take note, esteem, add worth, reaction, avoid doing from spamming and very soon be yourself, to have far better and more long-lasting positive results than trying to be someone or something you're not.

3.6 Pay Attention

In the '90s, the Golden Rule of connecting to a Use net News group or other online community was to listen first prior to speaking. Paying attention thoughtfully provides you a improved sense of not only what people are saying but also how they are feeling. inside implicit spaces where around are no optical indication, good listening skills become a general important aspect. Listening also helps you graph out your current social media footprint and measure your marketing campaigns over time. The only key to successful social media marketing is listening.

3.7 Act In Response

From the early days of setting up the first web presences for clients, my company outlined the importance of timely responses to any feedback or queries produced from those sites. The trouble of reaction can be grand, although it can be outdone by using the right tools and crowd sourcing answers. A quick response is of great importance, and thanks to search tools, alert apps and other services, it is possible to achieve. Don't be a hurdle, but a pathway.

3.8 Organize & Supervise

Social media alerts Google or social refer to are a great way to monitor your name as well as business. If somewhat major occurs in your business you'll recognize about it and can comment. If someone says something hopeful, a thank you goes a long way. If there are negative talks starting up around your given name or business, alerts stay you on peak of it along with you can take concern of belongings speedily.

3.9 Work Together

Before you go through social media for promotion and business, capture a gaze at who is exposed around moreover who is undertaking it in a healthy manner. How can you effort with them, as a replacement for of trying to strength your way into the space with all the money you have? Those will often be dollars wasted because people can feel that push and recoil from the hard sell, blog about your miss-step, sign petitions to boycott your business. However you put your cremation in places where it can do well, you'll be much more likely to get a positive result.

3.10 Perform Superior Gear

Back in the '90s, a mentor and dear friend Jerry Colonna talked about doing healthy with operation higher and constructing the declaration for me to create a successful business with an underlying assignment to assist others. Performing excellent gear can truly help you to achieve an achievement in societal media, as well. Now perform a Google hunt in favour of Social Media for Social Good towards noticing the power of this movement. It means fundamentally changing your business model from a single basics — profit — to a triple basics — people, planet, profit — and then perpetuating this social responsibility to all you execute in trade, together with online advertising and buying. Messages and conversations around social good are getting much more traction than the regular financial messages.

3.11 Respect The Strength Of The Web

The Internet was not meant for marketing and selling but for communication and connection to people and information. Understanding this, even today, can completely change your marketing and buying approach, however you'll include far-off extra achievement regarding the spirit of the WEB.

3.12 Furnish Regard

Social media works when you are liberal plus open-minded. Readily accessible is not anything mistaken through promotion, although things help when you give others praise for a moment. The rise of real re-tweeting, not spam re-tweeting — shows how far giving credit to others can go in social spaces.

3.13 Add Worth And Importance

Enter any online conversation with the aim of adding worth or importance. Before relocating a message as a fresh applicant, ask yourself: How is this providing value to the conversation, to the communities? In some situations, talking about your product or service can be considered expensive; it is adverse as well as snooping.

3.13 Share The Prosperity

When I used to talk about the Internet around the world, one key feature is to allocate it, but you have acquire it to contribute to it, extend it roughly, I had converse, other than I wasn't simply chatting about currency. I was chatting about moment, information with awareness. In social media, sharing is the oxygen in internet life.

IV. THE CLIMB OF DIGITAL REPUTATION

Numerous who rejoice the climb of social media notice it as helping a extensive alteration in social dealings, and, definitely, in the personality of free enterprise for instance (Benkler, 2006) [9] and (Bauwens, 2005) [10], authenticating the centrality of social assets, socialized fabrication and irrelevant effort. Add to this the increase of a society of community relationship, where the community demonstration and mediation of private sentiment and influence is obviously related to economic worth and we see the appearance of somewhat Adam Arvidsson and Nicolai Peitersen have given the expression 'the universal Sentiment' (Arvidsson and Peitersen, 2009)[11].

Immediately as Marx disagree that the common understanding, the collective information of every individual employees, would become a straight constituent of commercial fabrication, Arvidsson and Peitersen challenge

that at the side of this, 'various type of public influence, resembling reputation' is promising as a fresh 'benchmark of value'. Value approaches increasingly to depend on 'the capability of an entity to perform as a mechanism for streams of public influence' (Arvidsson and Peitersen, 2009)[11]. Though former to the digital era it was not possible to completely identify the degree of our social associations and relations or the collision of the social network we had rush, currently, social media like LinkedIn, Twitter, Google+, and Facebook offers a innovative 'protocol' for social dealings; they permit individuals' special associations to develop into more strong, represent-able, increasingly flexible, and, mainly, they provide public their emotional merits (Arvidsson and Peitersen, 2009: 17)[11]. Not merely preserve we observe the facts of dealings a person have, however we can measure their superiority and behaviour as well; 'this means to facilitate what used to be confidential or "friendly" information is currently flattering a community constraint that can organized in estimating the overall social value of an individual or association (Arvidsson and Peitersen, 2009)[11].

V. MEASURING BRAND VALUE

Similar to other brands, the achievement of the self-brand is evidenced by status, which must first be measured and signified. For improved understand this process we need only look to the ways in which other branded goods and corporations are routinely subject to abstract systems of measurement through which their value is constituted.

Agencies such as Inter-brand are dedicated to measuring a brand's equity by the extent to which consumers distinguish, utilize, and live through the brand name. This method depends entirely on measuring what are patently immeasurable values: the 'share of mind' in each customer, customer faithfulness, emotional relations, and sentimental attachment, in other words, reputation. Companies those who measure brand equity attempt to capture numerically, and by various tortured methods, the indescribable and intangible relationships and meanings humans are producing and reproducing out in the world. Certainly, brand valuation systems arose in the 1980s as a way for corporations to avoid expensive 'write-downs' during acquisitions or mergers; they could simply point to the value of the brand acquired as an excuse for paying more than the tangible assets were valuable. In this way corporations came to add brands 'as a type of intangible asset on their balance sheets' (Lury and Moor, 2010) [12]. Systems of Brand equity measurement were developed in order to manage a perception problem experienced by corporations and like this, may be read as an early form of promotional reputation management. Obviously the process of commensuration involved in brand valuation schemes, which transforms qualitative distinctions into quantitative ones, keenly works to depersonalize and de-particularize the very activities being calculated. Quite simply, these measurement strategies work to render liquid and generic individual meanings and sentimental investments in the brand in order to make them exchangeable on the marketplace; these systems mark the point at which human feelings are commoditized. It is in this sense that Adam Arvidsson claims brands constitute the most general form of value under post-Faddist informational capital (Arvidsson, 2006)[13] and (Lury and Moor, 2010)[12]. By focusing on which types of relationships and which kinds of meanings are most advantageous to a brand's ability to inspire consumer loyalty and thereby produce return, these measurement systems arguably produce brand value rather than measure it. Epistemology of branding then involves determining what kinds of human experiences and behaviours 'count' as most valuable to capital accumulation now and in the future. In this fashion, brand value measurement systems are

bio-political and penalizing. Brand equity measurement systems have much in common with systems of reputation measurement in the digital world.

VI. CONCLUSION

Nowadays it becomes extra significant than ever in the direction of obtaining charge of constructing, maintaining and sustaining digital reputation of yours as well as yours company. Your digital reputation is a collection of the entire mention plus cases of you lying on the Internet. It is essential to be positive in constructing a well-built digital reputation for the reason that this is frequently the initial impression to facilitate others has of you. At the end of this paper you will get the initial and basics information, guidelines, suggestion, and control for constructing a well-built and organized digital reputation.

These studies undoubtedly show to facilitate, if social media are put into practice properly, they can add importance in the ground of HR. however, a fulsome well-structured decision making along with carrying out process is compulsory to make sure achievement. The results moreover fetch to radiance which uncertain and stumbling block an HR team may well meet while annoying to effectively implement social media, furthermore what they must pay particular consideration too. Social media tools are only those tools. The real energy, spirit and power of social media are people. We are social media people.

Begin with doing a pride investigation. Afterwards, study how you can utilize social media in the direction of your improvement. After that, fabricate a digital portfolio as well as generate your private brand name. At last, utilize social media tools on the way to set up your proficiency. Formerly you should have a tough professional outline (e.g., LinkedIn, Facebook) or else digital assortment (e.g., www.torreytrust.com), afterwards share the link via adding up to your correspondence signatures, email, cover mail, CV/resume, and business cards. This will direct prospect employers towards your specialized site, which is greatly superior to waiting for them towards searching your name on Google.

"A superior digital reputation is greater than celebrity."

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IMPLEMENTATION OF UNMANNED AERIAL VEHICLE FOR SECURITY APPLICATIONS

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ABSTRACT

The main objective of the project is to design a Unmanned aerial vehicle for the surveillance purpose using high resolution video camera. This project is mainly focused on the UAV applications. The analysis of the existing Unmanned Aerial Vehicles is done for the purpose of implementing for the augmented reality purpose. The video camera is implemented in the Unmanned Aerial Vehicles to capture the video at which area need to focus on. The video captured by the camera is then transmitted to the PC with the use of the RF Transceiver system. The control of the UAV is done by interfacing the UAV with the Micro controller. Here the gyro sensor used for the interfacing purpose of the UAV with the remote control unit. The control signal for the controller is transmitted by the use of a RF Transceivers. So the required components are selected for the design of UAV with minimum weight and also camera in small size. By the thorough analysis this can be design, as the UAV with low cost and it is very useful while using at the reality top view.

Keywords– Unmanned Aerial Vehicle (UAV), RF transceiver, MEMS (microelectromechanical system).

I INTRODUCTION

The military use of unmanned aerial vehicles (UAVs) has grown because of their ability to operate in dangerous locations while keeping their human operators at a safe distance. The larger UAVs also provide a reliable long duration, cost effective, platform for reconnaissance as well as weapons.

The design of Unmanned Aerial Vehicles (UAVs) is currently hindered by the lack of a thorough understanding of the flow physics of very small aircraft flying at low speed. In many cases, the most effective design tool is trial and error which leads to lengthy and costly process. The development of functional Unmanned Aerial Vehicles (UAVs) within the last several years has been hindered by a limited understanding of the aerodynamics of small aircraft flying at low speeds. Unmanned aerial vehicles operate at significantly lower speeds and are small in size.

The use of Unmanned Aerial Vehicles (UAVs) to support such personnel has become commonplace in the military and with recent regulatory rulings will likely be increasing in the next few years in civilian sectors. Unmanned Aerial Vehicles (UAVs) that weigh only a few pounds have also been introduced in these settings.

Personnel in these situations have a primary mission other than operating the vehicle soldiers. Requiring such operators to have a specialized skill set for operating a UAV or MAV, requiring additional dedicated personnel to just operate the vehicles places additional demands on resources and could unnecessarily put more people at risk.

Moreover, in order for such systems to become viable in the commercial marketplace, the control devices will need to be easy to use with minimal training and low operational costs. One solution to these problems is to make the control of such systems sufficiently intuitive so that almost any computer-literate person can operate them with little to no training. Such a system could reduce hardware requirements, man power training time & cost can be significantly reduce by this system if such a control system leveraged off-the-shelf components. The UAV has a variety of potential uses in military operations, including fire control, and detection of intruders. For border patrol hostage rescue, and traffic surveillance Law enforcement organizations could use UAVs. For most of these applications, a swarm of UAVs could provide wide-area coverage.



Fig.1 Unmanned Aerial Vehicle

The above Figure 1 shows one of the type of Unmanned Aerial Vehicle. We can use this device for the purpose of checking the underground pipeline leakage and also used in various companies for the security purpose. In the nuclear power plant if there is any gas leakage or any damage which causes the radiation can be find by this small device instead of risking the human.

This is used to obtain various images of certain affected area during natural disasters for recovery missions. If we use UAV instead of helicopters at the time of flood, we can reduce the cost and also to obtain a quick process. This Unmanned aerial vehicle can go through any place where the mankind can't because of the miniature size. With the remote control we can operate the Unmanned Aerial vehicle for a particular range which is based on the technology used. The camera image or video is transmitting lively to the PC or such a device which we can take to that particular area. The device is used as a spy that it fetches the details that are needed by us.

II OVERVIEW OF PROPOSED SYSTEM

In this project we are going to design a UAV for the purpose of military based applications. A small UAV is designed with the high resolution camera. The camera is used to capture the video or an image in the area where the human cannot enter safely.

By our idea we can reduce the harm of war and we can avoid the soldier's death. The awareness of the area and the persons help to prevent any bad situations that going to happened by the terrorists.

This Unmanned aerial vehicle can go through any place where the mankind can't because of the miniature size. With the remote control we can operate the Unmanned Aerial vehicle for a particular range which is based on the technology used. The camera image or video is transmitting lively to the PC or such a device which we can take to that particular area. The device is used as a spy that it fetches the details that are needed by us.

Already we have several types of Unmanned Aerial Vehicles with various size and specifications. So in this paper we focus on two main things which are necessary for any kind of works. The important two factors are the size and the cost. Here we implement the Unmanned Aerial Vehicle with low cost, improvement of efficiency and life time.

III BLOCK DIAGRAM AND DESCRIPTION

Fig. 3.1 shows the block diagram of UAV. The transmitter part of UAV consists of PC (personal computer), signal processing unit, and the transceiver. The purpose of the transceiver is both to transmit and receive the signal. In the transmitter side the command from the PC is transmitted to the receiver with the help of transceiver. The reception of video from the camera can also be received by the transceiver.

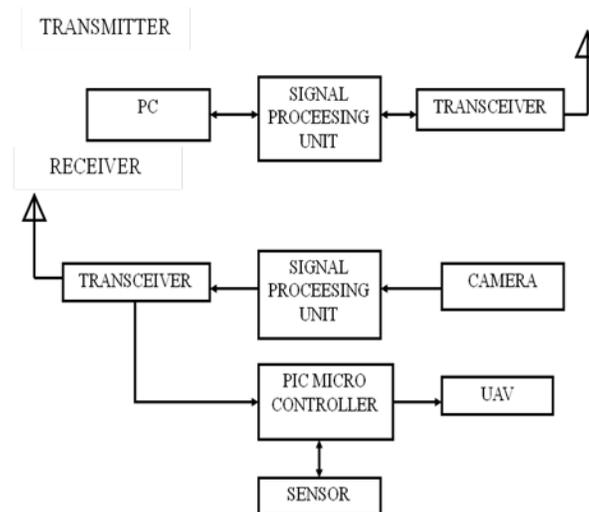


Fig.3.1 Block Diagram of UAV

The receiver block consist of UAV (Unmanned Aerial Vehicle), Micro controller, camera, signal processing unit and the transceiver. Camera is used to capture the video in the area of interest which is in analog form. The signal processing unit processes the analog signal from the camera and process the signal into the required form for the transmission.

Micro controller is used to control the unmanned aerial vehicle by the command which is transmitted from the PC. Turning the direction of UAV is done by microcontroller. The propellers on the UAV help the vehicle to take off, with the use of DC brushless motor.

IV PERFORMANCE ANALYSIS

The Quadcopter is considered an effective alternative to the high cost and complexity of standard rotorcraft. Employing four rotors to create differential thrust, the craft is able to hover and move without the complex system of linkages and blade elements present on standard single rotor vehicles. The Quadcopter is classified as an under actuated system. This is due to the fact that only four actuators (rotors) are used to control all six degrees of freedom

(DOF). The four actuators directly impact z-axis translation (altitude) and rotation about each of the three principal axes. The other two DOF are translation along the x- and y-axis. These two remaining DOF are coupled, meaning they depend directly on the overall orientation of the vehicle (the other four DOF). Additional Quadcopter benefits are swift maneuverability and increased payload. Drawbacks include an overall larger craft size and a higher energy consumption, which generally means lower flight time. From the fig 4.1 shows the without propeller of unmanned aerial vehicle and 4.2 shows the with propellers in unmanned aerial vehicle.



Fig.4.1 Note the propellers are removed.



Fig.4.2 Note the propellers are used.

4.1 Gyroscope

A gyroscope is a device for measuring or maintaining orientation, based on the principle of preserving angular momentum. Essentially, a gyroscope is a top, a self-balancing spinning toy, put to instrumental use. Tops were invented in many different civilizations. Mechanical gyroscopes typically comprise a spinning wheel or disc in which the axle is free to assume any orientation. Although the orientation of the spin axis changes in response to an external torque, the amount of change and the direction of the change is less and in a different direction than it would be if the disk were not spinning. When mounted in a gimbal (which minimizes external torque), the orientation of the spin axis remains nearly fixed, regardless of the mounting platform's motion. Gyroscopes based on other operating principles also exist, such as the electronic, microchip-packaged MEMS gyroscope devices found in consumer electronic devices, solid-state ring lasers, fibre optic gyroscopes, and the extremely sensitive quantum gyroscope.

4.2 Variations

- Ø MEMS
- Ø FOG
- Ø HRG

4.2.1 Properties

A free gyroscope maintains its axis. Gyroscopes can be used to construct gyrocompasses, which complement or replace magnetic compasses (in ships, aircraft and spacecraft, vehicles in general), to assist in stability (Hubble Space Telescope, bicycles, motorcycles, and ships) or be used as part of an inertial guidance system. Gyroscopic effects are used in tops, boomerangs, yo-yos, and gyroscopic exercise tools. Many other rotating devices, such as flywheels, behave in the manner of a gyroscope, although the gyroscopic effect is not being used

4.2.2 MEMS

A MEMS gyroscope takes the idea of the Foucault pendulum and uses a vibrating element, known as a MEMS (microelectromechanical system). The MEMS-based gyro was initially made practical and producible by Systron Donner Inertial (SDI). Today, SDI is a large manufacturer of MEMS gyroscopes.

4.2.3 FOG

A fiber optic gyroscope (FOG) is a gyroscope that uses the interference of light to detect mechanical rotation. The sensor is a coil of as much as 5 km of optical fiber. The development of low-loss single-mode optical fiber in the early 1970s for the telecommunications industry enabled the development of Sagnac effect fiber optic gyros.

4.2.4 HRG

The hemispherical resonator gyroscope (HRG), also called wine-glass gyroscope or mushroom gyro, makes using a thin solid-state hemispherical shell, anchored by a thick stem. This shell is driven to a flexural resonance by electrostatic forces generated by electrodes which are deposited directly onto separate fused-quartz structures that surround the shell. Gyroscopic effect is obtained from the inertial property of the flexural standing waves.

4.3 Accelerometer

An Accelerometer is a device that measures proper acceleration ("g-force"). Proper acceleration is not the same as coordinate acceleration (rate of change of velocity). For example, an accelerometer at rest on the surface of the Earth will measure an acceleration $g = 9.81 \text{ m/s}^2$ straight upwards. By contrast, accelerometers in free fall orbiting and accelerating due to the gravity of Earth will measure zero. Accelerometers have multiple applications in industry and science. Highly sensitive accelerometers are components of inertial navigation systems for aircraft and missiles. Accelerometers are used to detect and monitor vibration in rotating machinery. Accelerometers are used in tablet computers and digital cameras so that images on screens are always displayed upright. Accelerometers are used in drones for flight stabilisation. Pairs of accelerometers extended over a region of space can be used to detect differences (gradients) in the proper accelerations of frames of references associated with those points. These devices are called gravity gradiometers, as they measure gradients in the gravitational field. Such pairs of accelerometers in theory may also be able to detect gravitational waves.

V USES

- Ø Remote Sensing
- Ø Commercial Aerial Surveillance
- Ø Disaster Relief and Medical Assistance
- Ø Forest Fire Detection

5.1 Remote Sensing

UAV remote sensing functions include electromagnetic spectrum sensors, gamma ray sensors, biological sensors, and chemical sensors. A UAV's electromagnetic sensors typically include visual spectrum, infrared, or near infrared cameras as well as radar systems. Other electromagnetic wave detectors such as microwave and ultraviolet spectrum sensors may also be used but are uncommon.

5.2 Commercial Aerial Surveillance

Aerial surveillance of large areas is made possible with low cost UAV systems. Surveillance applications include livestock monitoring, wildfire mapping, pipeline security, home security, road patrol, and anti-piracy. The trend for the use of UAV technology in commercial aerial surveillance is expanding rapidly with increased development of automated object detection approaches.

5.3 Disaster Relief and Medical Assistance

Drones can help in disaster relief by gathering information from across an affected area to build a picture of the situation and give recommendations to direct resources. UAVs "Ambulance drones" rapidly deliver defibrillators in the crucial few minutes after cardiac arrests, and include live stream communication capability allowing paramedics to remotely observe and instruct on-scene individuals in how to use the defibrillators

5.4 Forest Fire Detection

Another application of UAVs is the prevention and early detection of forest fires. The possibility of constant flight, both day and night, makes the methods used until now (helicopters, watchtowers, etc.) become obsolete. Cameras and sensors that provide real-time emergency services, including information about the location of the outbreak of fire as well as many factors (wind speed, temperature, humidity, etc.) that are helpful for fire crews to conduct fire suppression.

VI DISCUSSION

The results of our study confirmed supported UAV navigation improves the position estimate and consequently the navigation of UAVs. The position estimate is more accurate. Compare to previous design with reduced cost and also camera small in size.

VII CONCLUSION

Several existing Unmanned Aerial Vehicle have been analyzed. The components have been selected in such a way to reduce the hardware complexity. Reduction of size and cost of the vehicle is mainly considered. The proposed UAV with camera can be used for the military applications. The exact location of the damage in the underground pipelining can be observed due to its smaller size. In the nuclear power plant if there is any gas leakage or any damage which causes the radiation can be found by this small device instead of risking the human. It is used to obtain various images of certain affected area during natural disasters for recovery missions. If we use UAV instead of helicopters at the time of flood, we can reduce the cost and also to obtain a quick process.

VIII FUTURE ENHANCEMENT

The future enhancement of the project can be carried out by designing the hardware module in compact size with various applications and used for industrial and Surveillance of Forest to monitoring the functions.

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INNOVATION AND APPLICATION OF PIEZOELECTRIC MATERIALS: A THEORETICAL APPROACH

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ABSTRACT

The coming era of world has moved to an exceptional leading contest of innovations and inspiration. In this paper, an attempt has been made to propose the existence and need of piezoelectric materials in the day to day technology, in order to secure the outstanding wasted energy, which can be easily stored and can be utilized in some useful work. There is a lot of mechanical energy which is produced in millions of works ranging from snores of sleep to the vibrations of a jet or rocket. These vibrational energies can be easily transformed to another form and can be utilized further with the help of these piezoelectric materials. This paper contains some of the modes and methods of working field of piezoelectric materials.

Keywords :*Piezoelectric, Ferroelectrics, Sonar, Pyroelectricity, Etymology*

1. INTRODUCTION

Materials always have had a large influence on society. This was obvious in the Stone Age, Bronze Age, and Iron Age. We have named these eras by the most advanced material in that period, since these materials determine and limit the state of technology at the time. Also in modern society, the influence of materials is still present. However, nowadays the materials as such are not as visible anymore as they used to be. They are more and more embedded in complex devices and high-tech systems that make whole economies exist and function in an efficient way. Piezoelectric materials are among these 'invisible' materials that are widespread around us, although they are unknown to the public at large. Mobile phones, automotive electronics, medical technology, and industrial systems are only a few areas where piezoelectric components are indispensable. Echoes to capture the image of an unborn baby in a womb make use of piezoelectricity. Even in a parking sensor at the back of our car, piezoelectric material is present.

1.1 What Is Piezoelectric Material?

The word 'piezoelectricity' is derived from the Greek word piezien, which means to squeeze or press. Piezoelectric materials are those materials (notably crystals and certain ceramics) which have the ability to generate an electrical potential in response to applied mechanical stress. In other words using piezoelectric

materials mechanical energy can be converted into kinetic energy and vice-versa, and the phenomenon used in it is called piezoelectricity or piezoelectric effect.

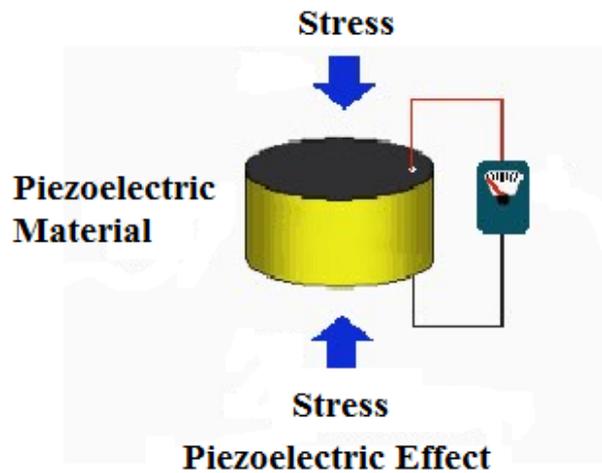


Fig. 1 Piezoelectric Effect

1.2 How Piezoelectric Materials Work

A piezoelectric material is made up of both positively and negatively charged particles arranged in such a way that all the positively and negatively charged particles are grouped about the same central point. If two opposite faces of a crystal are placed under pressure, the crystals can be slightly flattened and distorted and the charged particles moving up the crystals are pushed together and spread out sideways. The change is such that the average position of negative charge particles shifts slightly with respect to the same of positive charge particles. This means there is separation of positive and negative charges, which caused a potential difference between two faces crystal. The output voltage and power is directly proportional to the pressure applied. The output voltage is in mill volts and the output power is in microwatts. So for achieving bigger voltages crystals can be achieved in cascading manner.

By planting piezoelectric materials in place where vibrations are frequently placed, like, shoes, sidewalls, floors, mobile or laptop key boards, lathe and other machine tools, the power can be harvested and can be used in charging mobile phones, laptops etc.

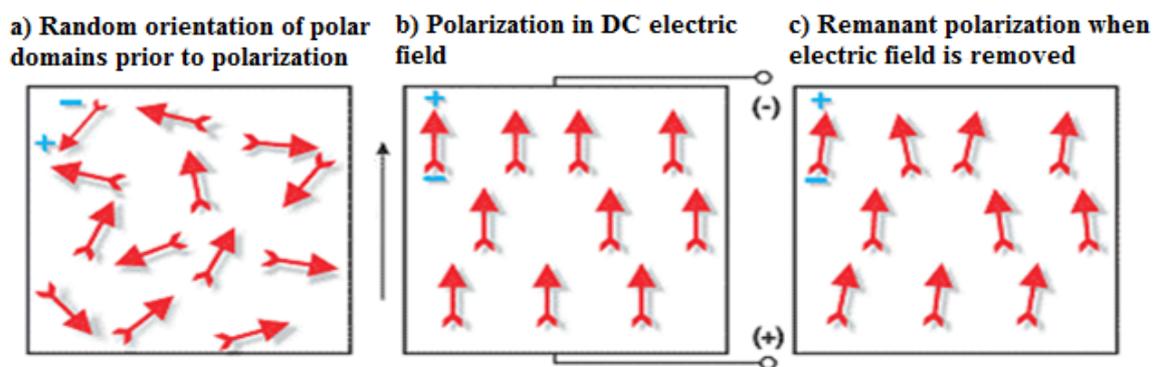


Fig. 2 Phenomenon of Piezoelectricity

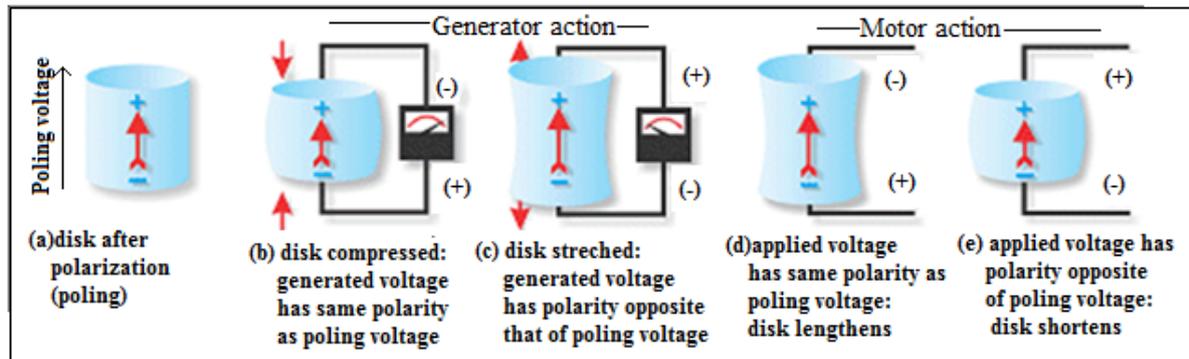


Fig. 3 Effect of Polarization

The material has the ability to convert mechanical energy into electric energy and vice versa.

The direct piezoelectric effect is when these materials are subjected to mechanical stress; generate an electric charge proportional to that stress.

The inverse piezoelectric effect is that these materials become strained when an electric field is applied, the strain again being proportional to the applied field. Clever use of piezoelectric materials enables the realization of a wide variety of technical functions.

1.3 Where Piezoelectric Materials Do Exist

Piezoelectric materials fall under the category of active materials which also includes magnetostrictive materials, shape memory alloys, magnetostrictive and electrostrictive fluids and ionic polymers.

The major advantages of these materials are their compactness, lightweight, low power consumption, ease of integration into critical structural areas, ease of activation through electrical signals, higher operating frequency and low cost. They are lightweight, robust, inexpensive and come in a variety of forms ranging from thin rectangular patches to complex shapes used in MEMS fabrication.

1.4 Practical Application And Scope

The phenomenon of materials that can convert mechanical energy into electric energy – and vice versa – carried out for several practical applications by means of discovering new piezoelectric materials and to develop new devices. In the present era piezoelectric materials have found its use in a vast range of applications as like mentioned:

(i) Conventional Machining.

Piezoelectric materials are very suitable materials because of their:

- High frequency band width (up to 3 kHz range).
- High dynamic stiffness ($>100 \text{ N}/\mu\text{m}$).
- Compact size and ability to produce high forces ($>10 \text{ N}$).

Used in micro machining operations like diamond turning, ring type stack actuators 25mm Outer diameter, 20mm long and 2 high long width capacitance sensors were responsible for measuring the motion of total relative to arm and a base surface.

Machining sinusoidal grid surface used a piezoelectric tube actuator with a band width of several nanometres.

(ii) Ultrasonic Assisted Machining

In ultrasonic assisted machining- used as ultrasonic vibration generator to provide efficient vibration to the total assembly because they can easily convert high frequency electrical energy into mechanical vibrations.

(iii) Active and Passive Vibration Control

Among the several source of vibrations the supuration chatter has been extensively investigated by many researchers. Chatters are self excited vibrations caused by modulation of cutting forces to change in uncut chip thickness. These vibrations are smaller in magnitude and higher in frequency than those typically found in other mechanical systems.

(iv) Wave Energy Converter through Piezoelectric Polymers

The capability of harvesting electrical energy from mechanical vibrations in a dynamic environment through piezoelectric transducers has been the topic of discussions for many years. Unused power exists in various forms such as vibrations, flowing water, wind, human motion and shock waves. Recent developments over global warming have renewed interest in the ocean energy conversion. The exploitation is heavily supported by the EU. Effective systems for high energy production are based, for example, on overtopping and oscillating water column systems. This note is part of a study that investigates alternative methods, and in particular a device that is based on the piezoelectric effect. Such effect has been mainly used in relation with low consumption systems like portable electronic devices such as mp3 players, mobile phones, GPS receivers or sensors of remote sensing systems or transmitters which are conventionally powered by batteries.

The advantage of a piezoelectric power supply is that it is ecological, embedded, and it does not need any maintenance. In this study we used piezoelectric polymers (PVDF) to convert ocean wave energy into electrical power. Due to viscous and fluid pressure exerted by the wave movement, the system is bending. The resulting undulating motion of the system resembles like the movement of a sea plant in the ocean ground. The capacity to sustain a high strain (3%) and to generate mill watts to many watts depending on the mechanical system makes piezoelectric polymer an interesting material in ocean energy and harvesting devices

II RECENT INNOVATIONS IN PIEZOELECTRIC MATERIALS

1. In piezoelectric inertia actuator acting as attuned vibrational observer to suppress chatter in tuning.
2. Force and torque sensors generally employ sensing that converts the applied force as torsional load into deformation of an element piezoelectric crystal has wider scope in this field.
3. Used in force transducers consist of the structure which deforms under the force, offer considerably high frequency response and long term stability.
4. In combined tool dynamometer to study the dynamic and static loading of tool. Strain gauge measures the static force and piezoelectric strips measure the dynamic force.
5. These days' magnetostructive devices are being more popular for measurement purpose. But it is for torque and force measurement in rotating shaft because there is no direct contact required to structure surface.
6. Piezoelectric sensors technology is particularly suitable for measuring acoustic emission, in machining process. For this a piezoelectric thin film sensor is deposited on a shim and located between cutting tool inserts and tool holder.

7. Used in vibration sensors of machining operations. The piezoelectric sensor are placed as close as possible to the cutting, e.g. on the shank, the tool post, the head stock or spindle.
8. In two piezoelectric force sensors rings in a direct driven motor spindle for online monitoring of machining.

III CONCLUSION

On the basis of available literature and research, piezoelectric materials can be suggested as a better replacement to traditional materials. Piezoelectric materials are that type of material which can create electricity when subjected to a mechanical stress. They will also work in reverse i.e., generating a strain by the application of an electric field.

The inherent advantage of these materials are their versatility in various fields such as in electrical, mechanical, marine, automobile engineering development and research organizations Apart from these the concept of piezoelectric material is also applicable in advancement of shape memory alloys, MEMS and NEMS devices etc.

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SOFTWARE RISK MANAGEMENT TECHNIQUES: A GENERAL SURVEY

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ABSTRACT

The development of the projects in the software related field, due to its complexity resulting in projects falling behind on deadlines, exceeding budgets and result in sub-standard products. Although, all these problems cannot be totally eliminated but they can be controlled by applying Risk Management methods and techniques. This can help to deal with problems before they occur. Organizations who implement risk management procedures and techniques will have greater control over the management of the project. There are different types of techniques for find out the risks in the software or control the risk before they occurs. In this paper, we will make a review of various software risk management techniques which are used recently and are helpful in handling the various type risks which occur during the software project development.

Keywords: Risk Management, Risk Control

I. INTRODUCTION

Software risk management is the process of indentify the software risks and planning to avoid those risks or to minimize their effects if they can't be avoided. By using risk management techniques we can decrease the harm or loss in software project. We already know that all risk can't be avoided, but by performing risk management, we can find risk at necessary time and can be handled at that time. The main objective of the software risk management is to identify, address and eliminate the software risks before they become threats to the success. In general good project managers are also very good managers of risk.

II. PURPOSE OF RISK MANAGEMENT

Basically the risk can be recognized as Uncertainty & Loss. Uncertainty is an event may or may not happen and Loss is an event has unwanted consequences or losses. Risk management involves studying a system or process thoroughly to identify concerns or potential risks, analysing them, and developing strategies for mitigation and control of the risks. Risk mitigation does not mean altogether eliminating the activities that create the risk. It may instead result in the reduction of the risk to an acceptable level.

When identifying risks to a software system, it is important to know all the possible risks, the level of severity of each risk and all the potential consequences of each. The action steps to mitigate or control each risk are

determined based on a thorough knowledge of all risks. This “preventative” approach to risk management allows software developers to finish projects within their expected timelines and budgets. Projects with effectively managed risks also tend to produce better quality outputs, in addition to reduced costs and time. Software risk management approaches assess risks during all the phases of software development, by integrating risk management practices along with the software development process.

III. RISK MANAGEMENT TRAINING PROGRAM

Basic fundamentals for risk management are:

1. Identify risks (business, process and integrity),
2. Calculate risk probabilities for quantitative assessments and to set realistic bands for qualitative assessments.
3. Calculate quantitative and determine qualitative risk impacts,
4. Determine when applying qualitative versus quantitative assessment is appropriate,
5. Perform safety and hazard analysis of a software product
6. Prepare and carry out risk mitigation, monitoring and management strategies.

IV. LITERATURE REVIEW

4.1 Project Risk Management: Lessons Learned From Software Development Environment [1]

The challenges in applying effective software risk management process are difficult, in particular integrating the risk management process into software development organization. The current perception trends of various software development projects are identified. In this paper the address lessons learned from implementing project risk management practices in software development environment.

4.2 State of Software Risk Management Practice [2]

In this paper, the researcher explores the idea of risk management practice within 37 software organization and then finds out that how companies studied have integrated their risk management with software development .There are some discrepancies between industrial practice and standard model. The industrial organization has not implemented important activities that are prescribed by the standard model. So in this paper the both the standard and industrial issues are suggested. In this paper, synthesized Risk management process model is also described.

4.3 The Importance of ‘Risk Radar’ in Software Risk Management: A Case of a Malaysian Company [3]

In this paper, ‘Risk radar’ is applied to a company in Malaysia. The main aim of study has been an analysis of risk management and risk exposure of software projects practices in the company. This study also shows the successes of the several software that goes into the Malaysian market, depending on how risk management and its plan in software development as in the case of the company. In this paper risks are identify with Pareto rules or techniques. It find the risks using 80/20 rules or Pareto Principle, 80% of the risks item listed by Boehm in Ten (10) Top Risks are due to 20% of sources . By using these rules most prominent risks find out in the Malaysian company such as rework, budget overruns cost overrun, content deficiencies and etc.; and ability to

own the technology rather than uses the technology with reasonable cost in development and always meet or exceed customer requirements in the market or in a company.

4.4 A Review of Risk Management in Different Software Development Methodologies (2012) [7]

There exists different software development methodology. It depends on the developer that which methodology he choose for developing the software and depends on several factors. One factor is that how risky the software is and the factor is that which methodology is used to support the risk management. The aim of the study is to comparing software development process models which support the risk management. In this paper, the researcher finds out the state of risks and risk management in software development process models. This study helps the project manager o developer to choose the methodology that is best for the project. The benefit is that it will make a way for further that aim at improving the software development process

4.5 Trivial model for mitigation of risks in software development life cycle [5]

Software development is an art of developing the software in the appropriate manner by using the software development model, but it depends on the developer that which model he use to develop the software. The development of software of software is a dynamic activity and it requires lot of rational thinking during the analysis, design, coding, testing and maintenance phases of software development. We know that when the development of the software is start there are the possibilities of occurring of r isks but the attention o risk management has been observed to be helpless to improve with the same pace to tackle the dynamically increasing software. In this way the need of software risk management felt by the academic and industrial community to minimize the losses and increase the profits and handle the software risks. In this paper firstly 18 prominent risk factors are indentify and using RIMAN model or technique of the software risk management that provide the step wise execution of risk handling methodology .The model presents the easy to understanding , flowchart to express the working of each mitigation against any risk factors.

4.6 Review of risk management methods [8]

The development of the project, especially in the software related field, due to its complex nature, could often encounter many unanticipated errors, resulting in projects falling behind on deadlines, exceeding budgets and result in sub-standard products. Although these problems cannot be totally eliminated, but they can be controlled by applying Risk Management methods. This can help to deal with problems before they occur. Organizations who implement risk management procedures and techniques will have greater control over the So in this paper the different type of techniques is summarized with their advantages and disadvantages and comparison is also describe. The purpose of this paper is summarized the five methods BOHUM, RISHIT, SEI-SRE, SERUM, SERIM. These methods can be used as a very effective software tool to minimize the risk.

V. CONCLUSIONS

With ever-increasing the complexity and increasing demand for bigger, better and faster the software industry is a high- risk business. When team does not manage risk they leave the projects vulnerable to factors that cause major rework or project failure. But adopting the software risk management program is the step every software manger can take to more effectively manage software development initiatives. Based on a positive, proactive

approach risk management can greatly reduce or eliminates the risks with in software projects. For eliminates the risks lot of work has been done in every field. To eliminate the software risks and make the software more reliable still the work is continue. In this paper, we make a review of some of these different techniques used in recently research papers that will be helpful to minimize the risk in project or software development.

Sr. no	Paper Name	Technique Used	Conclusion
1.	A state of risk management practice	SYNTHESIZED risk management process	Standard models not sufficiently reflected the practice, need of organization studied.
2.	The important of "Risk Radar" in software development life cycle	80/20 pareto principles	Importance aspects of human management ensuring success of s/w development.
3.	Trivial for mitigation of risk in software development life cycle	RIMAN modal	Identified strategies to avoid risk mitigation strategies.
4.	Review of risk management method.	BOHAM, RISKIT, SEI-SRE,SERUM,SERIM	Methods for select and implement and eliminate the risk in project substantially reduced.

VI. ACKNOWLEDGEMENT

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A STUDY OF CORE AND ITS TYPES FOR CASTING PROCESS

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ABSTRACT

Casting is one of most important and prime process in manufacturing industry. Basically cast irons are used for casting purpose, as it is having highest fluidity characteristic, which will allow molten cast iron to flow properly into the cavities. Cores form internal cavities inside the structure which will then leads to the final casting shape. Sand inside the cores and pattern gives strength and rigidity to the casting structure. Properly conditioned sand will gives better results. This paper focus on casting and core in detail.

Keywords: Cast iron, Casting, core, fluidity, manufacturing industry, strength and rigidity

I. INTRODUCTION

Casting is the process of producing metal/ alloy component parts of desired shapes by pouring the molten metal / alloy into a prepared mold (of that shape) and then allowing the metal/alloy to cool and solidify. The solidified piece of metal/alloy is known as casting. Casting is the basic process in industry, so we never skip it from industry [1]. To enhance the casting process, we must need to improve the quality of sand and sand muller improves this quality. A core is essentially a body of materials which forms components of the mold. It possesses sufficient strength to be handled as an independent unit. Core is an obstruction which when positioned in the mold, naturally does not permit the molten metal to fill up the space occupied by the core. In this way a core produces hollow casting. Cores are required to create the recesses, undercuts and interior cavities that are often apart of castings. Cores are employed as inserts in mould to form design features that are otherwise extremely difficult to produce by simple moulding [2]. The dry silica sand is used as a basic refractory material for pre-preparing core. This sand withstands for high temperature of metal poured in the mould.

II. LITERATURE REVIEW

SR NO.	TITLE AND AUTHOR	CONCLUSION
1.	Accessing the performance of binders on core strength in metal	In this work, the highest valuable results for binder performance on core strength were achieved with Arabic gum, starch and molasses of 2, 3, 4, 6 and 8%, respectively

	casting Popoola A. P.1 and Fayomi O. S. [1]	at 200°C in 1.5 h. Composition of core properties shows that the core hardness/strength is affected by the nature of core treatment before, during and after baking.
2.	Green sand dilution by new and core sand additions paper 11 119 AFS proceedings Biersner and J.Thiel [3]	The new research attempted to emulate foundry operations by limiting the amount of time the sand was muller. The testing recently conducted attempted to stress the sand by adding both dilutions sand and the corresponding amount of bentonite but maintaining a minimum amount of mulling time.

In 1924, the Ford automobile company set a record by producing 1 million cars, in the process consuming one-third of the total casting production in the U.S. As the automobile industry grew the need for increased casting efficiency grew. The increasing demand for castings in the growing car and machine building industry during and after World War I and World War II, stimulated new inventions in mechanization and later automation of the sand casting process technology. There was not one bottleneck to faster casting production but rather several. Improvements were made in molding speed, molding sand preparation, sand mixing, core manufacturing processes, and the slow metal melting rate in cupola furnaces. In 1912, the sand slinger was invented by the American company Beardsley & Piper. In 1912, the first sand mixer with individually mounted revolving plows was marketed by the Simpson Company.[3] In 1915, the first experiments started with bentonite clay instead of simple fire clay as the bonding additive to the molding sand. This increased tremendously the green and dry strength of the molds. In 1918, the first fully automated foundry for fabricating hand grenades for the U.S. Army went into production. In the 1930s the first high-frequency coreless electric furnace was installed in the U.S. In 1943, ductile iron was invented by adding magnesium to the widely used grey iron. In 1940, thermal sand reclamation was applied for molding and core sands. In 1952, the "D-process" was developed for making shell molds with fine, pre-coated sand. In 1953, the hotbox core sand process in which the cores are thermally cured was invented. In 1954, a new core binder—water glass (sodium silicate) hardened with CO₂ from the ambient air, came into use.

III. CORE

3.1 Types of core

3.1.1 According to the state or condition of core

A . Green sand core

Green sand cores are formed by pattern itself.

- A green sand core is a part of the mold
- A green sand core is made out of the same sand from which the rest of mold has been made i.e molding steel.

B. Dry Sand cores

- Dry sand cores, unlike green sand cores are not produced as a part of the sand.
- Dry sand cores are made separately and independent of that mold
- A dry sand core is made up of core sand which differs very much from the sand out of which the mold is constructed.

- A dry sand core is made in a core box and it is baked after ramming.
- A dry sand core is positioned in the mold on core seats formed by core print on the pattern.
- A dry sand core is inserted in the mold before closing the same.

3.2 According to the nature of core materials employed:

A Oil bonded cores

- Conventional sand cores are produced by mixing silica sand with a small percentage of linseed sand.

B. Resin – bonded cores

- Phenol resin bonded sand is rammed in a core box
- The core is removed from the core box and baked in a core oven at 375 to 450 f to harden the core

C . Shell cores

- Shell cores can be made manually or on machines.
- The procedure of making shell cores is as follows:
 - The core box is heated to temperature of the order of 400 to 600 F.
- i. Sand mixed with about 2 to 5 % thermosetting resin of phenolic type is either dumped or blown into the preheated metal core box.
- ii. Where sand blowing is employed, it is preferred to use resin precoated sand to avoid resin segregation.
- iii. The resin is allowed to melt to the specified thickness.
- iv. The resin gets cured.
- v. The excess sand is dumped and removed.
- vi. The hardened core is extracted from the core box.
- vii. Cores thus produced needs no further baking.
- viii. Shell core posses very smooth surface (3125 micro mm root mean square) and close tolerance. (+_ 0.003 mm/mm).
- ix. Shell core making process can be mechanized and several core making machines are commercially available.
- x. High permeability is achieved in shell core making.
- xi. Shell cores can easily stored for future use.
- xii. Shell cores are costly as compared to cores produced by other methods.

D. Sodium silicate – CO₂ cores

- These cores use a core material consisting of clean, dry sand mixed with a solution of sodium silicate.
- The sand mixture is rammed into the core box.
- The rammed sand while it is in the core box is gassed for several seconds with CO₂ gas. As results a silica gel forms which binds sand grains into a strong solid form. $\text{Na}_2\text{SiO}_3 + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3 + \text{SiO}_2$ (silica sand)
- Cores thus produced usually need no baking.
- Cores thus formed possess more strength than the oil /resin bonded cores.
- Unhardened cores are not handled so that there is no chance of braking or sagging of cores.
- Core dryer is not required.

- Core formed by CO₂ process are used in the production of cast iron, steel, aluminum and copper base alloy castings.
- The used sand mixture however cannot be recovered and reused.

3.3 According to the type of core hardening process employed

A . Hot box process

- It uses heated core boxes for the production of cores.
- The core box is made up of cast iron, steel or aluminum and possesses vents and ejectors for removing core gases and stripping cores from the core box respectively.
- Core box is heated from 350 to 500 F.
- Heated core box is employed for making shell cores from dry resin bonded mixtures.
- Hot core boxes can also be used with core sand mixture employing liquid resin binders and a catalyst.

B. The cold set process

- While mixing the core sand, an accelerator to the binders.
- The sand mixture is very flowable and is easily rammed.
- Curing begins immediately with the addition of accelerators and continues until the core is strong to be removed from the core box.
- A little heating of the cores hardens it completely.
- Cold set process is preferred for jobbing production.

C . Castable sand process

- A setting or hardening agent such as dicalcium silicate is added to sodium silicate at the time of core sand mixing.
- The sand mixture possesses high flowability and after being poured in the core box, it chemically hardens after a short interval of time.
- As compared to CO₂ process, where it may not be possible to gas the full core uniformly and to obtain uniformly hardened cores, castable sand process produces much better and uniform results.

D Nishiyama process

- Nishiyama process uses sodium silicate bonded sand, which is mixed with 2% finely powdered ferrosilicon.
- Hardening occurs because of exothermic reaction of silicon with Noah produced by hydrolysis in the solution of sodium silicate
- Cores thus made possess short bench life.

E Oil no-bake process

- The process employs a synthetic oil binder which when mixed with basic sands activated chemically produces cores that can be cured at room temperature.
- The sand may consist of:
 - Washed and dried sand
 - Oil no-bake binders and catalyst
 - Oil no-bake cross linking agent

- In oil no-bake process, the polymerization reaction results in a complete and uniform setting of the complete core sand mass.
- This process assures better depth of set, fast baking, easier core withdrawal and lower production cost as compared to furan or oil bonding process.

3.4 According to the Shape and Position of the Core

A Horizontal Core

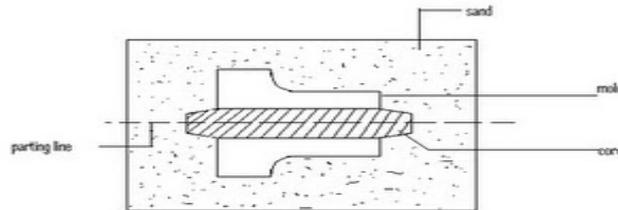


Fig1 Horizontal Core

B Vertical Core

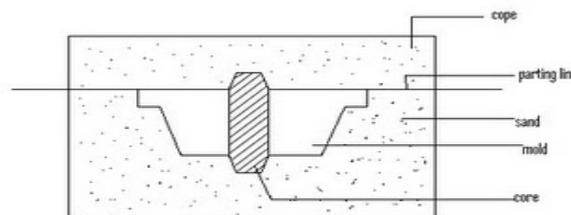


Fig 2 Vertical Core

C Hanging or Cover Core

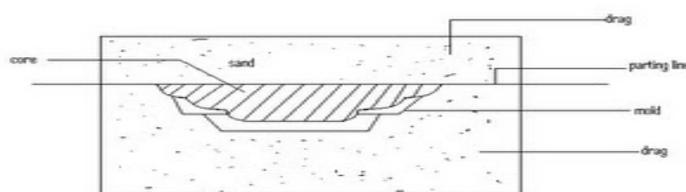


Fig. 3 Hanging or Cover Core

D Drop or Stop off Core

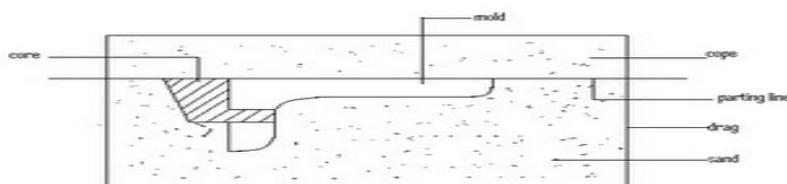


Fig. 4 Drop or Stopoff Core

E. Balanced Core

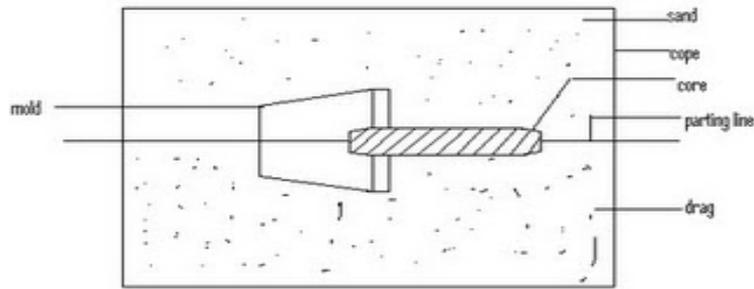


Fig. 5 Balanced Core

F Ram Up Core

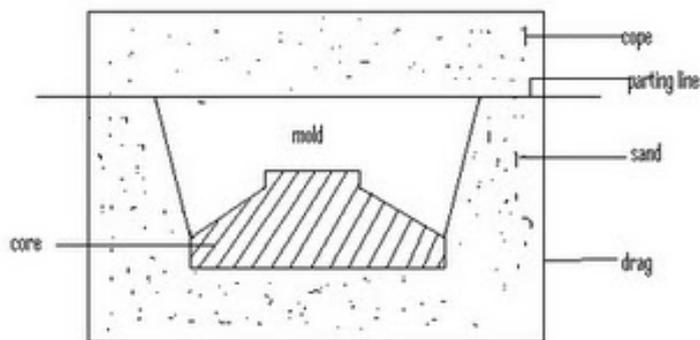


Fig.6 Ram up Core

G Kiss Core

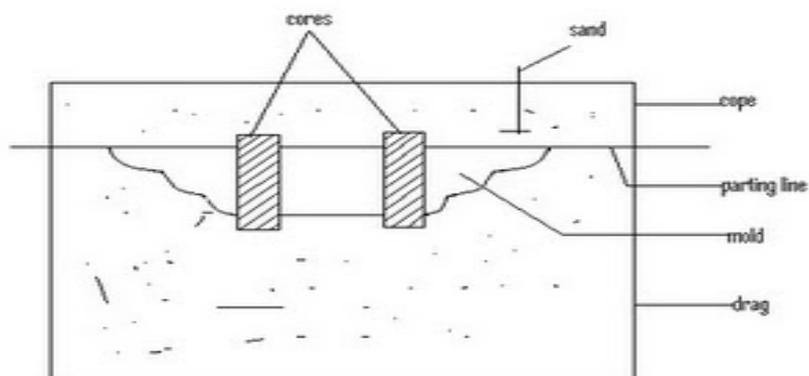


Fig. 7 Kiss Core

IV. CORE APPLICATIONS

1. Core and core forms greatly increase the versatility of molding and casting operations.

2. Before being used for forming recesses and holes in the castings, cores are also employed:

- As a strainer, gates and pouring cups.
- As riser core.
- For making molds.
- As core mold in centrifugal casting process.
- As slab core for increasing casting output from one mold.

V CORE BOX

5.1 Core box

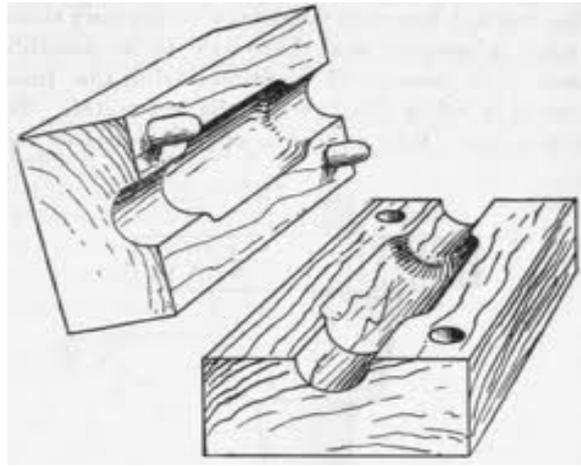


Fig 8 Conventional Core Box

1. A core box is basically a pattern for making cores
2. Core boxes are employed for ramming cores in them
3. Core boxes impart the desired shape to the core sand.
4. Core boxes range from simple wooden structures to precision metal assemblies which possess long life under extracting condition.

5.2 Types of core boxes

1. Half core box.
2. Slab or dump core box.
3. Split core box.
4. Left and right hand core box.
5. Strickle core box

5.3 Finishing of cores

1 Baked cores are finished before they can be set in the mold.

2 finishing consists of:

- i. Cleaning
- ii. Trimming

- iii. Brushing
- iv. Coating
- v. Mudding Sizing
- vi. Core assembly

5.4 Setting of Cores

- Core setting means placing cores in the mold
- In order to obtain correct cavities in the castings the cores should be accurately positioned in the molds.
- Cores in the moulds should be firmly secured so that they can withstand the buoyancy effect of the being poured molten metal.
- Small cores are set in the moulds by hand whereas big cores may required a crane for the purpose.

VI SAND CORE

The forming of holes, internal cavities and other internal surface of casting depends on cores. Therefore core can be defined as that portion of mould which form the hallow interior of casting or hole through the casting.[2] Casting is produced in the foundry by pouring in molten metal into a mould made to shape of the component required.

Castings play a vital part in all branches of engineering. The flexibility of casting production techniques enable practically, all shapes to be produced. Though naturally, production cost is important. In domestic application casting are used for stoves, gates, cookers, radiators, bath, piping for main water supply and drainage. However the product of casting on a large scale is a sophisticated and capital-intensive business. Cores are also used in shaping external surface of cast product when a pattern is so shaped that it forms a core as an integral part of the mould such a core is known as green sand core.

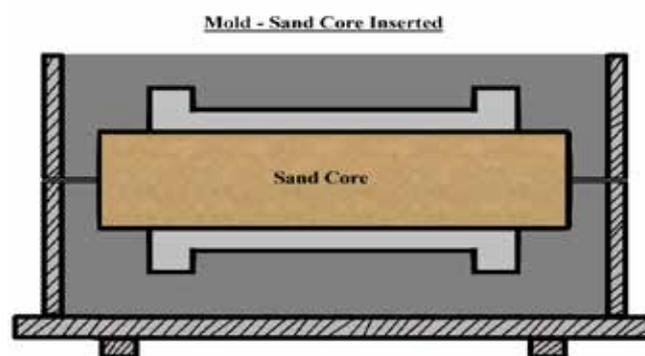


Fig 9 Sand Core

Though this is acknowledge as an economical method of forming cavities in casting. It is limited to hallow of short length. But binder suitable for foundry core must not only hold sand grain together but must also be sufficiently resistant to high temperature, in order for it to collapse and allow sand to be easily removed from the casting leaving it surface smooth [4]. The ability of the binder to collapse on

cooling is known as breakdown and this property is very important to cores hole, which are in accessible to felting.

6.1 Requirements of Core

6.1.1 There are seven requirements for core:

- a. In the green condition there must be adequate strength for handling.
- b. Permeability must be very high to allow for the escape of gases.
- c. As the casting or molding cools the core must be weak enough to break down as the material shrinks. Moreover, they must be easy to remove during shakeout.
- d. Good refractoriness is required as the core is usually surrounded by hot metal during casting or molding.
- e. A smooth surface finish.
- f. A minimum generation of gases during metal pouring

6.2 Binders

Special binders are introduced into core sands to add strength. The oldest binder was vegetable oil, however now synthetic oil is used, in conjunction with cereal or clay.[1]The core is then baked in a convection oven between 200 and 250 °C (392 and 482 °F). The heat causes the binder to cross-link or polymerize. While this process is simple, the dimensional accuracy is low.

Another type of binder process is called the hot-box process, which uses a thermoset and catalyst for a binder. The sand with the binder is packed into a core box that is heated to approximately 230 °C (446 °F) (which is where the name originated from). The binder that touches the hot surface of the core box begins to cure within 10 to 30 seconds. Depending on the type of binder it may require further baking to fully cure

In a similar vein, the cold-box process uses a binder that is hardened through the use of special gases. The binder coated sand is packed into a core box and then sealed so that a curing gas can be introduced. These gases are often toxic (i.e. amine gas) or odorous (i.e. SO₂), so special handling systems must be used. However, because high temperatures are not required the core box can be made from metal, wood, or plastic. An added benefit is that hollow core can be formed if the gas is introduced via holes in the core surface which cause only the surface of the core to harden; the remaining sand is then just dumped out to be used again. For example, a cold-box sand casting core binder is sodium silicate which hardens on exposure to carbon dioxide.

Special binders are used in air-set sands to produce core at room temperature. These sands do not require a gas catalyst because organic binders and a curing catalyst are mixed together in the sand which initiates the curing process. The only disadvantage with this is that after the catalyst is mixed in there is a short time to use the sand. A third way to produce room temperature cores is by shell molding.

VII. CONCLUSION

Casting has shown wide range of applications. Core plays the important role without which casting process will not get complete. We have studied types of core used for casting processes. This paper in simple, presents a review on core and its types for casting processes in detail. To increase the strength of cores internal wires and rods can be added. To enhance collapsibility straw can be added to the middle of the core or a hollow core can be used. This attribute is especially important for steel casting because a large amount of shrinkage is present.

Except for very small cores, all cores require vent holes to release gases. These are usually formed by using small wires to create holes from the surface of the mold to the core.

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SECURING WIRELESS SENSOR NETWORKS WITH PUBLIC KEY TECHNIQUES

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ABSTRACT

A secure protocol for spontaneous wireless ad hoc networks which uses an hybrid symmetric/ asymmetric scheme and the trust between users in order to exchange the initial data and to exchange the secret keys that will be used to encrypt the data. Trust is based on the first visual contact between users. Our proposal is a complete self-configured secure protocol that is able to create the network and share secure services without any infrastructure. The network allows sharing resources and offering new services among users in a secure environment. The protocol includes all functions needed to operate without any external support. We have designed and developed it in devices with limited resources. Network creation stages are detailed and the communication, protocol messages, and network management are explained. Our proposal has been implemented in order to test the protocol procedure and performance. Finally, we compare the protocol with other spontaneous ad hoc network protocols in order to highlight its features and we provide a security analysis of the system

Keyword: Spontaneous, Network, Protocol, Infrastructure.

I. INTRODUCTION

Spontaneous ad hoc networks are formed by a set of mobile terminals placed in a closed location that communicate with each other, sharing resources, services or computing time during a limited period of time and in a limited space, following human interaction pattern. People are attached to a group of people for a while, and then leave. Network management should be transparent to the user. A spontaneous network is a special case of ad hoc networks. The related literature shows several security methods such as pre distribution key algorithms, symmetric and asymmetric algorithms, intermediate node-based methods, and hybrid methods. But these methods are not enough for spontaneous networks because they need an initial configuration or external authorities.

II.EXISTING SYSTEM

Spontaneous ad hoc networks are formed by a set of mobile terminals placed in close location that communicate with each other, sharing resources, during a limited period of time and in a limited space. Spontaneous networks imitate human relations and service should not damage the functionality. Configuration services in spontaneous networks depend significantly on network size, the nature of the participating nodes and running applications. None of the existing papers propose a secure spontaneous network protocol based on user trust that provides node authenticity, integrity checking, and privacy.

2.1 Disadvantages

- Ø Efficient and User-friendly security mechanisms are not provided.
- Ø Cooperation among the nodes are not satisfied in the network.
- Ø Authentication mechanisms and secure routing protocols are not provided.

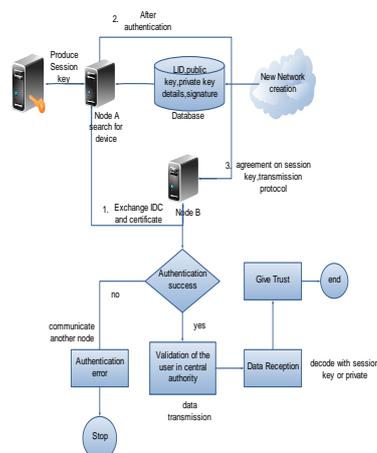
III. PROPOSED SYSTEM

In proposed system we analyze secure self-configured environment for data distribution and resources and services sharing among users. The network allows sharing resources and offering new services among users in a secure environment. It allows the creation and management of distributed and decentralized spontaneous networks with many authentication and validation process. We have provided some procedures for self-configuration: unique IP address is assigned to each device, the DNS can be managed efficiently and the services can be discovered automatically. We have also created a user-friendly application that has minimal interaction with the user.

3.1 Advantages

- Ø The security schemes included in the protocol allow secure communication between end users.
- Ø There are no anonymous users, because confidentiality and validity are based on user identification.
- Ø Allow trusted users only after several security process.
- Ø Our proposed security protocol is adaptable because new security cryptographic algorithms can be easily added.
- Ø Provide High level of security throughout the transmission process.

IV. SYSTEM ARCHITECTURE

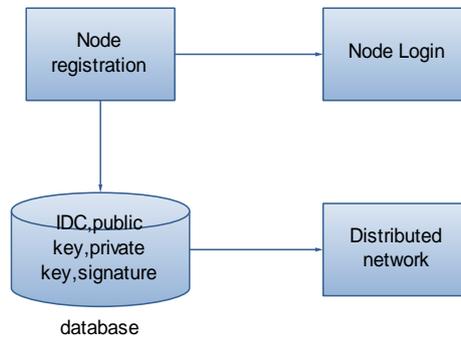


V. MODULES

1. Nodes Registration and activation.
2. Spontaneous network creation.
3. Authentication process and trust level.
4. Secure Data transmission in spontaneous network.

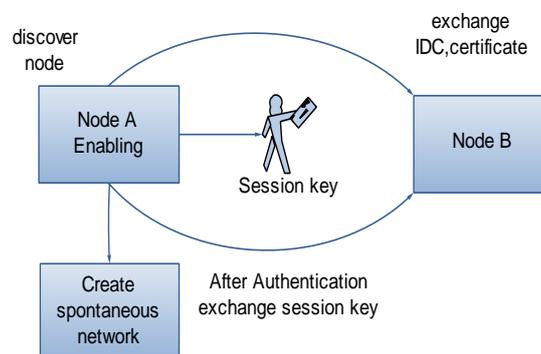
5.1 Nodes Registration and Activation.

Before the network creation we have to register the nodes and its details such as name, ip address, port number, password etc. Node details are stored and maintained in our database. Nodes need to enter the ip and port number to activate themselves. After that a first node create the network by our secure protocol after authorization and authentication. Every node contains Identity card, certificate, public (LID), signature and private components in the network.



5.2 Spontaneous Network Creation

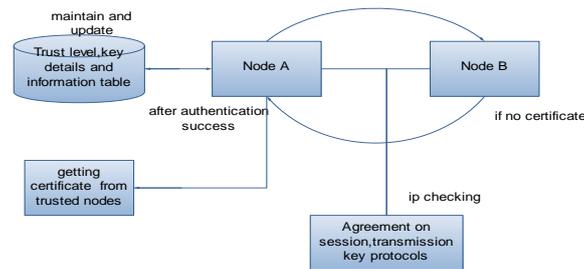
In this section the very first node creates the spontaneous network and random session key. Then the first node searches the another node within its communication range for data transfer. If exist, the first node send its public key. Then the second node will send its IDC signed by first node's public key. Next, first node validates the received data and verifies the hash of the message in order to check that the data has not been modified. In this step, first node establishes the trust level of second node by its location is looking physically close or not. Finally, first node will send its IDC data to second node. This data will be signed by second node's public key. Second node will validate first node's IDC and will establish the trust and validity in first node only by integrity verification and authentication.



5.3 Authentication Process and Trust Level

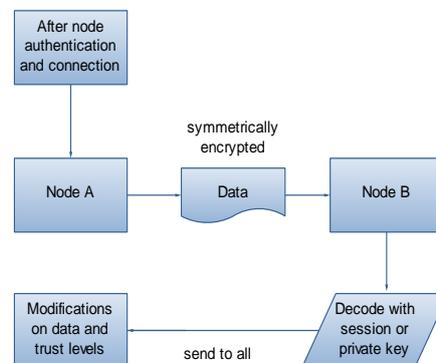
After the spontaneous network creation the nodes discover the other nodes for communication. Every node must validate the node identity, data, certificate verification, ip address, before pairing. After the authentication process, each node learns the identity card of other known nodes, a public key and a LID. This information will be updated and completed throughout the network nodes. After the mutual authentication, first node will encrypt the session key with second node's public key and will send it to second node. Then, they will agree the transmission protocols and the wireless connection speed. For example If node A did not establish trust level

with node B directly, it can be established through trusted chains, e.g., if A trusts C and C trusts B, then A may trust B.



5.4 Secure Data Transmission in Spontaneous Network

After all the authentication and identification process in the spontaneous network nodes transfer data with nearest trustable nodes. A user can ask other devices in order to know the available services. It has an agreement to allow access to its services and to access the services offered by other nodes. Services provided by a node are available only if there is a path to that node, and disappear when the node leaves the network. After that node can send data to another node by symmetrically encrypted and the receiver checks whether it is encrypted or not and decode with session key or private key. So the receiver check the data and update the regarding information such as trust level, integrity etc.



VI. CONCLUSION

In this paper, we show the design of a protocol that allows the creation and management of a spontaneous wireless ad hoc network. It is based on a social network imitating the behavior of human relationships. Thus, each user will work

to maintain the network, improve the services offered, and provide information to other network users. We have provided some procedures for self-configuration: a unique IP address is assigned to each device, the DNS can be managed efficiently and the services can be discovered automatically. We have also created a user-friendly application that has minimal interaction with the user. A user without advanced technical knowledge can set up and participate in a spontaneous network. The security schemes included in the protocol allow secure communication between end users (bearing in mind the resource, processing, and energy limitations of ad hoc devices). We have performed several tests to validate the protocol operation. They showed us the benefits of using this self-configuring ad hoc spontaneous network. The response times obtained are suitable for use in real environments, even when devices have limited resources. Storage and volatile memory needs are quite low a protocol can be used in regular resource-constrained devices (cell phones, PDAs...).

VII. FUTURE ENHANCEMENT

We intend to add some new features to the user application (such as sharing other types of resources, etc.) and to the protocol, such as an intrusion detection mechanism and a distributed Domain Name Service by using the LID and IP of the nodes. Now, we are working on adding other types of nodes that are able to share their services in the spontaneous network.

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