Gestation Tracking System using Cloud Computing

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Abstract — *Biometric technology that involves the identification and verification of individuals by the human fingerprint characteristics, which have been widely used in various aspect of life for different purposes. In this project, Pregnancy treatment alert system in the rural areas, we initially focuses that the biometric thumb impression of the pregnancy lady with their child is taken by Admin and the doctor for identification purpose and information pertaining to blood group, vaccination details etc., are stored in the Hospital centralized database which will be used for treatment purpose without undertaking basic tests. This database activation through Biometric technology helps to save time and energy and also paves ways for safe guarding the lives of human beings by starting immediate treatment without wasting any time during emergency situations. The database is subject to updating then and there by the admin during the course of treatment, which will help the hospital to have track on record. The main aim of this project is to develop accurate, fast and very efficient automatic reports details, which will be generated using fingerprint verification technique. We propose a system in which fingerprint verification is done by using extraction of minutiae technique and the system that automates the whole process of taking appropriate update by checkup information by concern hospital doctors.*

Keywords- Cloud Computing; Biometric Technology; Natal Tracking System

I.   INTRODUCTION

It is possible that drivers who have not undergone appropriate training and testing may be deficient in some aspect of the knowledge and skills required to drive safely and efficiently. Fingerprints are imprints formed by friction ridges of the skin and thumbs. They are generally used for security based application because of their immutability and individuality. Immutability refers to the permanent and unchanging character of the pattern on each finger. Individuality refers to the uniqueness of ridge details across individuals. An automatic fingerprint identification system is widely adopted in many applications. Fingerprints are taken from fingerprint sensor and compared with the fingerprint images stored in the database. Image is compared by module itself. In this project we have implemented Fingerprint matching technique involving fingerprints, which we all human beings carry on with them by default.

The main objective of this project is without filling the manual details entry of any hospital to start immediate treatment without wasting any time during emergency situations and alert for master checkup during their pregnancy period in the rural area people. The primary purpose of this venture is to guide the fingerprint scanner for login information access of any medical center to initiate quick treatment without spending any time during urgent circumstances. In the existing system, the patient can be verified manually at static place. The unwanted doctors use fake reports when they are giving false treatment by the user. In this system there may be a lot of complex results their hospitals names get spoiled to the public [1].

Our proposed is fingerprint technological innovation that includes the recognition and confirmation of individuals by the individual finger marks features which have been commonly used in various part of life for different reasons. In this venture, the fingerprint thumbs impact of the rural area people during their pregnancy is taken by Administrator i.e. Doctor for recognition objective and details associated with blood group, vaccination details etc., are saved in the Medical center to the centralized database which will be used for therapy objective without challenge basic assessments. This data source initial through fingerprint technological innovation helps to save your efforts and effort and effort and also paves ways for safe protecting the lives of humans by starting immediate therapy without spending any moment during urgent circumstances. The data source is subject to updating then and there by the admin during the course of therapy, which will help a medical facility to have track on record.

The main aim of this paper is to create an precise, fast and very efficient automated reviews details, which will be produced using finger marks confirmation strategy. We recommend a program in which finger marks confirmation is done by using removal of details strategy and the program that performs the whole process of taking appropriate updating by check-up details by issue hospital doctors [2].

II.   RELATED WORK

In present research attempt has been taken to figure out the degree of metastasizing cancer of mind cancers using synthetic intellect. The dubious areas in mind as recommended by the radiologists have been segmented using unclear c-means clustering strategy. Fourier descriptors are used for accurate removal of border functions of the growth area. As Fourier descriptors present a huge number of feature vectors that may encourage the problem of over learning and chance of misclassifications, the recommended analysis system effectively search the significant border functions by

inherited criteria and nourish them to the flexible neuro-fuzzy centered classifier. In addition to shape centered functions, textural arrangements are also integrated to achieve advanced level of precision in analysis of cancers. The research includes 100 mind pictures and has shown 86% correct category rate [3].

In a statistical structure research, structure functions are calculated from the mathematical submission of noticed mixtures of extremes at specified roles comparative to each other in the picture. According to the variety of strength factors (pixels) in each mixture, research are categorized into first-order, second order and higher-order research. The Grayish Level Co-occurrence Matrix (GLCM) method is a way of getting second purchase mathematical structure functions. The strategy has been used in a variety of programs, Third and greater purchase designs consider the connections among three or more p. These are hypothetically possible but not generally applied due to computation time and presentation problems. A GLCM is a matrix where the number of rows and columns is equal to the number of gray levels, G, in the image. The matrix element $P(i, j \mid \Delta x, \Delta y)$ is the relative frequency with which two pixels, separated by a pixel distance $(\Delta x, \Delta y)$, occur within a given neighborhood, one with intensity 'i' and the other with intensity 'j'. The matrix element $P(i, j \mid d, \theta)$ contains the second order statistical probability values for changes between gray levels 'i' and 'j' at a particular displacement distance d and at a particular angle (θ). Using a large number of intensity levels G implies storing a lot of temporary data, i.e. a $G \times G$ matrix for each combination of $(\Delta x, \Delta y)$ or (d, θ). Due to their large dimensionality, the GLCM's are very sensitive to the size of the texture samples on which they are estimated. Thus, the number of gray levels is often reduced. GLCM matrix formulation can be explained with the example illustrated in fig 2.1 for four different gray levels. Here one pixel offset is used (a reference pixel and its immediate neighbour). If the window is large enough, using a larger offset is possible. The top left cell will be filled with the number of times the combination 0,0 occurs, i.e. how many time within the image area a pixel with grey level 0 (neighbour pixel) falls to the right of another pixel with grey level 0(reference pixel) [4].

In this system, we manipulate the ability of Back Propagation Neural Networks (BPN) and Radial Basis Function Neural network (RBFN) to categorize mind MRI pictures to either cancer or noncancerous growth instantly. It is categorized with specific to balance of mind picture, revealed in the axial and coronal pictures. The initial purpose of this study was not to discover which criteria is excellent in category projects, but to analyze the advantages and downsides of each criteria under different circumstances. Using the maximum structure functions produced from normal and growth areas of MRI by using mathematical functions, BPN and RBF classifiers are used to categorize and section the growth section in irregular pictures. Both the examining and training stage gives the amount of precision on each parameter in sensory systems, which gives the idea to choose the best one to be used in further performs. The results revealed outperformance of RBFN criteria in comparison to BPN with category precision of 85.71% which performs as appealing device for category and needs expansion in mind growth analysis [5].

A k-winner-take-all (kWTA) network is able to find out the k largest numbers from n inputs. Recently, a dual neural network (DNN) approach was proposed to implement the kWTA process. Compared to the conventional approach, the DNN approach has much less number of interconnections. A rough upper bound on the convergence time of the DNN-kWTA model, which is expressed in terms of input variables, was given. This brief derives the exact convergence time of the DNN-kWTA model. With our result, we can study the convergence time without spending excessive time to simulate the network dynamics. We also theoretically study the statistical properties of the convergence time when the inputs are uniformly distributed. Since a non-uniform distribution can be converted into a uniform one and the conversion preserves the ordering of the inputs, our theoretical result is also valid for nonuniformly distributed inputs [6].

This paper presents a new recurrent neural network with a one-layer architecture and a discontinuous hard-limiting activation function for solving quadratic programming problems. The global convergence of the neural network with reduced model complexity is proven based on the Lyapunov theory and non-smooth analysis method. The neural network is capable of solving general quadratic programming with strictly convex objective function over the set defined by equality constraints. In addition, a sequential quadratic programming approach to general nonlinear programming is developed based on the proposed quadratic programming neural network. Three simulation examples are given to illustrate the results for quadratic programming, nonlinear programming, and SVM learning [7].

III. FINGER PRINT SYSTEM

Automated fingerprint identification is the process of automatically matching one or many unknown fingerprints against a database of known and unknown prints. Automated fingerprint identification systems are primarily used by law enforcement agencies for fake identification initiatives, the most important of which include identifying a person suspected of committing a crime or linking a suspect to other unsolved fake reporting [8].

Automated fingerprint verification is a closely related technique used in applications such as treatment status and access control systems. On a technical level, verification systems verify a claimed identity (a user might claim to be John by presenting his PIN or ID card and verify his identity using his fingerprint), whereas identification systems determine identity based solely on fingerprints[9].With greater frequency in recent years, automated fingerprint identification systems have been used in large scale civil identification projects. The chief purpose of a civil fingerprint identifications system is to prevent multiple enrollments in an electoral, welfare, driver licensing, or similar system.

Another benefit of a civil fingerprint identifications system is its use in background checks for job applicants for highly sensitive posts and educational personnel who have close contact with children.

IV. FINGERPRINT MATCHING ALGORITHMS

Fingerprint matching algorithms vary greatly in terms of Type I (false positive) and Type II (false negative) error rates. They also vary in terms of features such as image rotation invariance and independence from a reference point (usually, the "core", or center of the fingerprint pattern). The accuracy of the algorithm, print matching speed, robustness to poor image quality, and the characteristics noted above are critical elements of system performance.

Fingerprint matching has an enormous computational burden. Some larger AFIS vendors deploy custom hardware while others use software to attain matching speed and throughput. In general, it is desirable to have, at the least, a two stage search. The first stage will generally make use of global fingerprint characteristics while the second stage is the minutia matcher [10].

In any case, the search systems return results with some numerical measure of the probability of a match (a "score"). In fingerprint searching, using a "search threshold" parameter to increase accuracy, there should seldom be more than a single candidate unless there are multiple records from the same candidate in the database. Many systems use a broader search in order to reduce the number of missed identifications, and these searches can return from one to ten possible matches. Latent to fingerprint searching will frequently return many (often fifty or more) candidates because of limited and poor quality input data [11]. The confirmation of system suggested candidates is usually performed by a technician in forensic systems. In recent years, though, "lights-out" or "auto-confirm" algorithms produce "identified" or "non-identified" responses without a human operator looking at the prints, provided the matching score is high enough. "Lights-out" or "auto-confirm" is often used in civil identification systems, and is increasingly used in criminal identification systems as well. The flexibility of identity verification that today's driver's license provides to its holder in many face-to-face transactions has significantly increased the need to maintain the accuracy and security of personal data [12].

V. RESULT AND DISCUSSIONS

5.1 Pre Natal Tracking

The testing of the fetus before it is born is known as prenatal diagnosis or prenatal screening. The gynecologists and the midwives have the capability to monitor the mother's health during the pregnancy. The medical history of the mother must be constantly monitored with the main factors being checking for multiple fetuses, possible risks to the mother (miscarriage, ectopic or molar pregnancy), etc. The fetal health and development is also measured so that any complication can be tackled from early stages itself. Malformation of the fetus for conditions such as club foot, cleft palate and many more. At the regular intervals of the pregnancy, the development and the growth of the various organs and body parts such as heart, lungs, skull, etc. All these tests are carried out with the help of ultrasound and various other scans. Extra scans are generally ordered when the woman or the fetus shows signs of an abnormality. The scans are also done to determine the size, placental position during the final stages of the pregnancy. The prenatal care includes of the pregnant woman visiting the hospital every month for the first six months. During seventh to eighth month the pregnant woman has to visit every two weeks after which weekly visits until delivery are expected. The data collected throughout the period of pregnancy is stored in the cloud under the person's Aadhar card account so that the data can be accessed by the doctor anywhere and anytime. This allows the collaboration of various health personnel to diagnose and treat the patients remotely [13].

The medical history of the patients forms the core the any health system. The questionnaire focus on different aspects of a women's health that are needed to decrease the infant and child mortality. The questions are set in such a way that they are very precise yet simple straightforward in nature.

The basic health details of the woman are taken from them in the form of the questionnaire which can be filled on paper or digitally. This health data acts as an extension to the Aadhar Card which gives us enormous benefits of the same. These details can be accessed by a doctor sitting in a remote location.

The medical reports of the pregnant women are kept track of until the child is born. The reports are accessible by doctors in urban areas through the system, they diagnose the condition of the pregnant woman and update the necessary medicines and treatment required back into the system. The frequency of check-up and dates are also updated into the system. Based on the diagnosis of problem the pregnant women are categorized into groups and they are assigned to systems that would manage each of the category.

The data collected throughout the period of pregnancy is stored in the cloud under the person's Aadhar card account so that the data can be accessed by the doctor anywhere and anytime. This allows the collaboration of various health personnel to diagnose and treat the patients remotely [14]. The schedule for pre natal system is shown in figure 1.
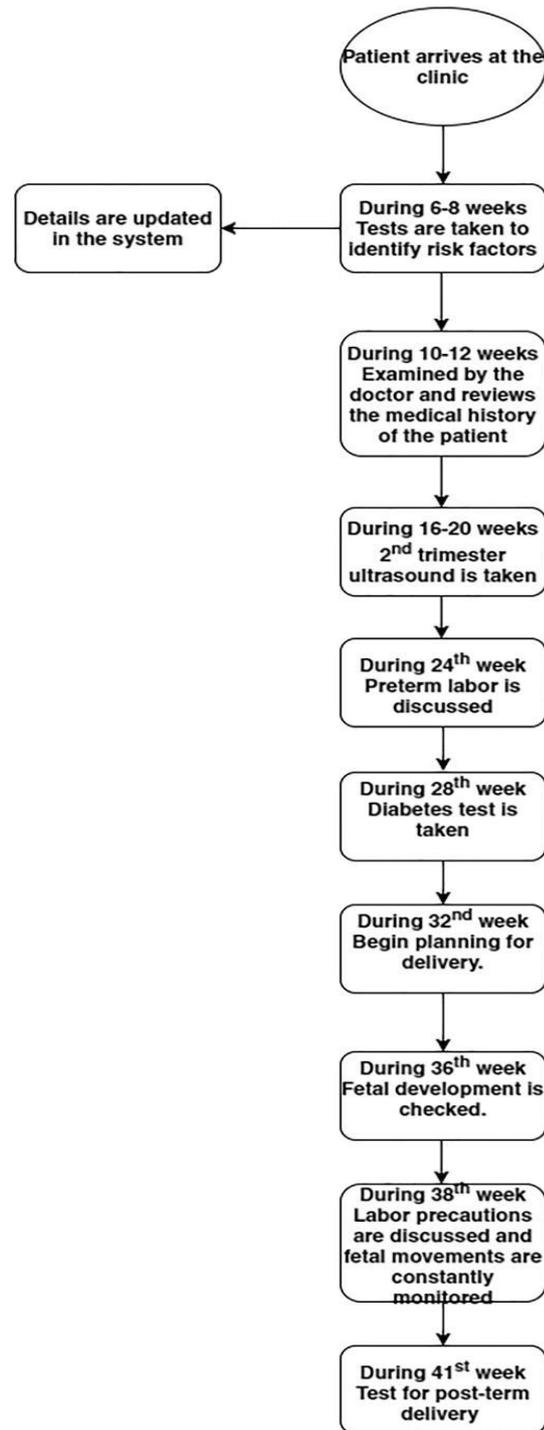
Fig. 1 Pre-Natal Schedule

5.2 Post Natal Tracking

Prenatal care is followed by postnatal care to ensure good health of the child until the age of five. Postnatal care is critical since most maternal and infant deaths occur during this time. Yet, this is the most neglected period for the provision of quality care. The first step to postnatal care is the registration of the child. If the child is born still, then it is declared dead and is added to the database for child mortality rate analysis. The registration of birth certificate and Aadhar card is a must since it provides authorized proof of birth, place of birth and other personal details that are required to avail any of the services provided by the government. The health details of the child such as birth weight, health status, medical issues if any are added to the Aadhar card details in order to keep track of the child's medical history and to address health issues if any. These details are added along with the Aadhar card details to produce the child's medical reports. These reports are loaded into the system's database for future reference [15]. Doctors are not available at the rural health care centers at a moment's notice. This system allows the doctor to access patient details from the city and guide the midwives and nurses with the procedures to be followed in times of need.

The second step to postnatal care is supervision of neonatal period of the child. The neonatal period is the first 28 days from the child's birth and is considered to be very critical. Preterm children are considered to be the most critical since they have high risk to mortality and morbidity. These premature babies are taken care of at the health care center until the end of neonatal period and further if needed. Incubation services are also provided in this system. Depending on the condition of the child, the child is suggested with corresponding medications by a doctor in the city through the system. The child is also tested based on communicable diseases in the surrounding area. This allows earlier diagnosis of the disease and can be treated at an earlier stage times of need [16].

Immunization process is also monitored by this system. Immunization helps prevent diseases from affecting the child by the usage of vaccinations that have to be given at the right time to the child. Certain diseases that cannot be treated easily once affected can actually be prevented by immunization. The immunization table suggests the right dosage of vaccination and the right time to be given to the child. Immunization process until the age of 5 is tracked by this system. The children are immunized periodically according to the immunization table. The diseases such as DTP, Polio, Hepatitis A, Hepatitis B and Typhoid are prevented by the use of vaccinations. Child nutrition is also taken care of by regular nutrient supply by the nearest health care center [17]. The schedule for post natal system is shown in figure 2.
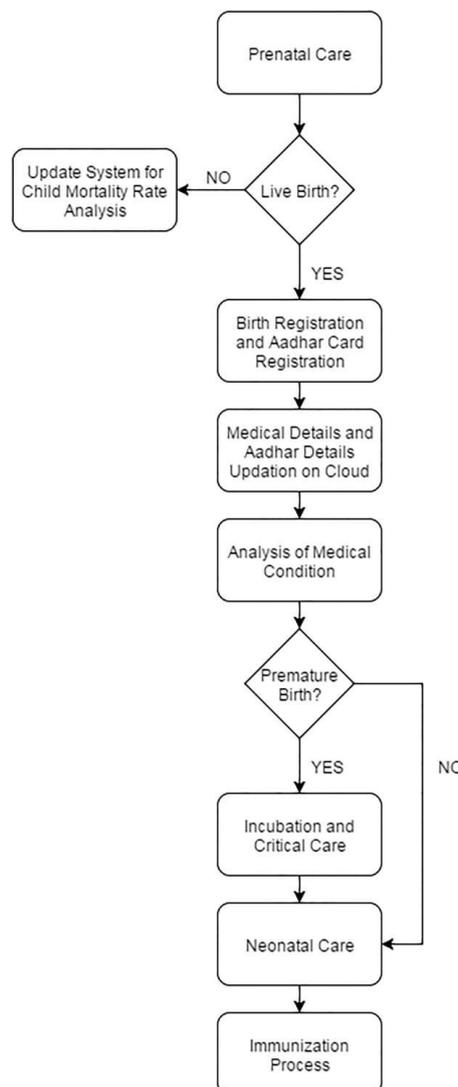

Fig. 2. Post Natal Schedule

5.3 SMS ALERT

The appointment date for the pregnant ladies is tracked in Cloud and an intimation message will be sent to the pregnant woman two days before appointment and the vaccination date for the babies are also tracked and intimation message will be sent.

This message will make the patients to be aware of the date, so that there will regular monitoring of the health condition. The architecture diagram for SMS allotment is shown in figure 3.
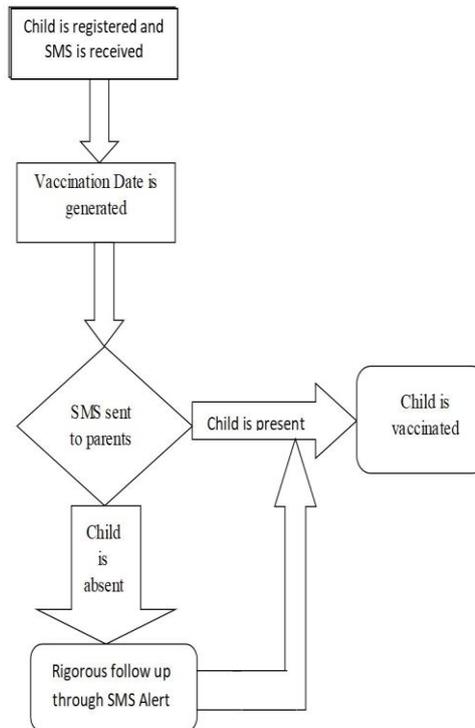
Fig. 3 Architecture for SMS allotment

5.4 FEASIBILITY ANALYSIS
5.4.1 TECHNICAL FEASIBILITY

Evaluating the technical feasibility is the trickiest part of a feasibility study. This is because, at this point in time, not too many-detailed design of the system, making it difficult to access issues like performance, costs on (on account of the kind of technology to be deployed) etc.

A number of issues have to be considered while doing a technical analysis [18].

5.4.1.1   Understand the different technologies involved in the proposed system:

Before commencing the project, we have to be very clear about what are the technologies that are to be required for the development of the new system.

5.4.1.2 Find out whether the organization currently possesses the required technologies:

Is the required technology available with the organization?

If so is the capacity sufficient?

For instance – "Will the current printer be able to handle the new reports and forms required for the new system?"

5.4.2 OPERATIONAL FEASIBILITY:

Proposed projects are beneficial only if they can be turned into information systems that will meet the organizations operating requirements. Simply stated, this test of feasibility asks if the system will work when it is developed and installed. Are there major barriers to Implementation? Here are questions that will help test the operational feasibility of a project:

5.4.2.1   Is there sufficient support for the project from management from users? If the current system is well liked and used to the extent that persons will not be able to see reasons for change, there may be resistance.

5.4.2.2   Are the current business methods acceptable to the user? If they are not, Users may welcome a change that will bring about a more operational and useful systems.

5.4.2.3   Have the user been involved in the planning and development of the project? Early involvement reduces the chances of resistance to the system and in General and increases the likelihood of successful project.

Since the proposed system was to help reduce the hardships encountered In the existing manual system, the new system was considered to be operational feasible [19].

5.5 ECONOMIC FEASIBILITY

Economic feasibility attempts 2 weigh the costs of developing and implementing a new system, against the benefits that would accrue from having the new system in place. This feasibility study gives the top management the economic justification for the new system. A simple economic analysis which gives the actual comparison of costs and benefits are much more meaningful in this case. In addition, this proves to be a useful point of reference to compare actual costs as the project progresses. There could be various types of intangible benefits on account of automation. These could include increased customer satisfaction, improvement in product quality better decision making timeliness of information, expediting activities, improved accuracy of operations, better documentation and record keeping, faster retrieval of information, better employee moral [20-22].

VI.   CONCLUSIONS AND FUTURE ENHANCEMENTS

We suggest that the fingerprint scanner technology that contains the identification and verification of individuals by the individual part represents functions which has been widely used in various part of lifestyle for different reasons. In this project, the part represents thumbs effect of the designed pregnancy pupil is taken by Control i.e. Physician for identification purpose and information associated with blood vessels team, vaccination information etc., are stored in the Medical center main databases which will be used for treatment purpose without procedure main tests. This databases preliminary via. Part represents technology helps to preserving initiatives and energy and attempt and attempt and also paves ways for safe defending the way of lifestyle of people by beginning immediate treatment without investing any time during immediate conditions. The database is topic to updation then and there by the control during the course of treatment, which will help a healthcare center to have observe on record. The future of this documents is to make an accurate, fast and very effective computerized opinions information, which will be designed using part represents verification technique. We suggest a system in which part represents verification is done by using elimination of information technique and the system that works the whole procedure of taking appropriate updation by check-up information by problem healthcare center doctors.

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