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Covid-19 Employee Safety and Business Continuity Tracker

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Abstract- As Coronavirus (COVID-19) spreads across the world, leading organizations need to ensure the health and safety of hundreds of thousands of employees, as well as millions of customers. This confusing, fast-changing situation demands scalable and flexible technology to ensure business continuity Tracker. In the year of 2020, pega worked with a major company – one with over 200,000 employees and care providers . This application enables the organization to track and manage the health, safety, and availability of its entire workforce. Inspired by this work and its meaningful impact for millions of clients and employees, Using pega we building the COVID-19 Employee Safety and Business Continuity Tracker helps to identify the employee risk status. Using Pega we developing COVID-19 Employee Safety and Business Continuity Tracker to be used by clients across any industry. Organizations can easily customize how the software reacts to different risk scenarios to meet the unique needs and policies of their own business. Along with that serving the IT service Request for all the employees who need electronic gadgets to ensure business deliverables on time. The Tracker is available in English, French, German, Italian and Spanish.

Keywords:- Business Continuity, easily customize etc.

I. INTRODUCTION

The COVID-19 Employee Safety and Business Continuity tracker app was built as an accelerator that we can download and configure to use as your wish, or modify based on the unique needs of your business. Organizations can use it to: Enable employees to notify their employer of their health status take action as each employee's status changes manage employee availability for on-site or remote work track how many employees have been exposed to the COVID-19 virus, tested, or self quarantined help healthy employees re-enter the workforce.

Clients can quickly configure the Pega app and integrate it with existing systems, including HR and scheduling, to perform additional functions such as: Identifying other employees who might have been planning to maintain ongoing work with unaffected staff Alerting other departments who need to take action on building access, scheduling, and communication with an intuitive visual approach, the Pega Platform development environment enables professional and citizen developers alike to configure software faster, more accurately, and at less cost.

It also leverages intelligent automation, case management, AI, and robotics to drive business processes and customer journeys from end to end. Pega unifies these back-end processes with its customer engagement applications on the front end to empower businesses to provide superior customer experiences on any channel.

Employee safety and business continuity tracker helps to find each and every employee risk ,safety

and health condition of the particular organization. Based on the employee status manager or admin can do some necessary actions. This system automatically giving mails if the employee once take the survey. After, 5 business days the system will generate another mail to take the survey because the system need update status to the employee. Based on the unique pega case ID we can track the particular employee.

Also In the system dashboard we can see all the details like who have high risk, low risk, who recently logined to the system etc ., if the employee want to do work from home the person need any gadgets then the system will manually raise one request to IT service request team.

II. LITERATURE SURVEY

The users reiterated that the app was useful in alerting them from COVID-19. These ideas were predominantly accompanied by the functions performed by the app such as disease monitoring, assessment of individuals and updates.

Reviews quoting usefulness were often accompanied by the suggestions to improve the app's features; these included: Integration with GPS systems and maps, user alerts in red zones/hot-spots, provision of regular COVID-19 updates, enabling contact tracing, and making the app workable on feature phone platforms.

Aarogya Setu stores location data and requires constant access to the phone's Bluetooth which, experts say, makes it invasive from a security and privacy viewpoint. The guidelines were issued by the National Executive Committee set up under the National Disaster Management (NDMA), the Aarogya Setu Data Access and Knowledge Sharing protocol.

Concerns and cautions Users also reported unfavourable feedback reflecting their concerns in using the app. They categorized their reservation in terms of dataspecific, system-specific, and users'-specific concerns. It was found that the application relies on self-reported data for tracking positive cases and proximity assessment.

This feature is critically reliant on authentic information provided by the users. Concerns about the inaccuracy of data provided were found to be inhibiting potential users to use this app. Several system specific shortcomings were noted as well. Specifically, bugs within software, issues with one time password registration, and poor user interface and unnecessary use of Bluetooth feature causing frequent power drain were the common system specific challenges faced by the users. In some reviews, it was also observed that users uninstalled the app due to these issues.

After the outbreak of COVID-19, some researchers employed traditional SEIR (Susceptible-Exposed-Infectious-Removed) model to simulate the spread of the epidemic and applied personnel migration data to modify the model [3].

Zhu et al. [4] investigated the city-scale dynamics of the epidemic using mobile phone city data. They also trained and validated models based on the classic SIR (Susceptible-Infectious Removed) model to predict the future trend in different scenarios.

Liu et al. [5] designed a flow SEIR model that utilizes Baidu migration data to estimate the risk of epidemic spread when people return to work after holidays.

Li et al. [6] employed a SEIR model that considers the effect of control measures to predict the spread of virus. From a statistical point of view, Fu et al. [7] applied the Boltzmann function to simulate the cumulative number of confirmed cases in each province/municipality and mainland China and predicted the developing trend of confirmed cases in subsequent weeks.

Danon et al. [8] constructed a model to estimate early transmission trends and peak times of the disease in England and Wales and analyzed the effects of seasonal variation in transmission rates. Based on the accumulated data sets of reports, deaths, isolation and suspected cases.

Tang et al. [9] consider that the epidemic trend mainly depends on isolation and suspected cases. Thus, it is very important to continue to strengthen quarantine and isolation strategies and improve the detection rate.

Wu et al. [10] collected and analyzed medical observation, discharge, infection, non severe, critical, cure, and death data and employed this state transfer matrix model to predict the peak inflection

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time and patient distribution to better allocate medical resources [11].

Anastassopoulou et al. [12] evaluated the basic regeneration number (R0) and other major epidemiological parameters and predicted the infected population three weeks after the outbreak development according to the estimated parameters [13].

Bert-Dufresne et al. [14] emphasized the urgent need for tracking close contacts during outbreaks of emerging infectious diseases and the need to use a larger number than the R0 value when predicting the size of epidemics.

Based on data-driven analysis, **Zhang et al. [15]** estimated the basic regeneration number and outbreak scale of COVID-19 during the outbreak stage on the Diamond Princess cruise ship.

The previously mentioned study mainly simulates the time series of the number of infections, immunizations, deaths, cures and time nodes of pandemic influenza based on the classical infectious disease infection model [16], [17].

In addition to the traditional SIR/SEIR infectious disease model, some analytical methods from the Geographic Information System (GIS) and Social Network Analysis (SNA) have been introduced to the derivation of infectious diseases [18]–[22]. Powerful geospatial data collection, management, processing, analysis and display capabilities of Geographic Information System are increasingly employed by scholars for early warning research on infectious disease surveillance based on a combination of the strength of prevention and control measures, support capacity, support resources and severity of outbreaks in different regions [9], [23].

III. EXISTING SYSTEM

In real time scenario's the most company's & organization's are using Google form to know the employee status. Also separately the employee need to write email and need to contact the IT service request team. Currently the government using Aarogya setu to predict the Risk Level. We developing the application that is predicting risk in particular organizational level using rule mining and clustering algorithm. We can predict the risk level using rule mining & clustering algorithm, Risk mitigation strategy, Predictive model. Risk mitigation strategy providing inaccurate risk prediction, have ambiguity problem, it required complex calculations. Rule mining algorithm taking too many parameters, time consuming. Predictive model have privacy issue, high complexity, it does not always provide accurate analysis.

IV. PROPOSED SYSTEM

Decision Strategy algorithm helps to the system to take risk level decision. Based on the user input the system identifying the decision Strategy Algorithm combinations and predicting the risk level.

We building the project in the format of Enterprise class structure. access group restricts access to functionality within your application. You can create multiple access groups for the same application to achieve different levels of access control. A privilege is an application-specific access control element associated with a class and access role.

1. Features of the Purposed System:

Enable employees to notify their employer of their health status. Take action as each employee's status changes. Manage employee availability for on-site or remote work. Track how many employees have been exposed to the COVID-19 virus, tested, or self-quarantined. Help healthy employees re-enter the workforce. To provide Support of Electronic Gadgets like Laptop, Mouse, etc to the Employees.

1.1 Single Sign on Authentication: Single Sign On, also known as SSO, allows users to have access to multiple applications by signing in using only one account to different systems and resources. This is highly convenient for users, since, by identifying themselves just once, it is possible to maintain a valid session for the rest of the applications which use SSO.

Using the Single Sign On identification system, it is possible to have multiple accesses with a single account; for example, by signing in to Gmail we will have access to its various web applications, such as Google Docs, Google Maps, Google Books, etc. There are different types of implementations for SSO.SSO authentication will validate the particular employee will present in this organization or not. If employee present in the Org system will navigate to right Portal else system will throw an error on the UI.

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There are different types of implementation for SSO, Simple cookie based-Applications hosted on the same organization domain can share the authentication credentials stored cookies.Smart card based authentication – Here the credentials are stored in your smart card.All you need to do is authenticate the password once and the smart card can provide access to all other applications.

Security Assertion Markup Language(SAML)—This is the most commonly used SSO implementation method in Pega. SSO works based upon a trust relationship set up between an application, known as the service provider, and an identity provider, like OneLogin. This trust relationship is often based upon a certificate that is exchanged between the identity provider and the service provider.

This certificate can be used to sign identity information that is being sent from the identity provider to the service provider so that the service provider knows it is coming from a trusted source. In SSO, this identity data takes the form of tokens which contain identifying bits of information about the user like a user's email address or a username.

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1.3 Email Integration Mechanism: We making connection establishment Pega to Gmail. Using email account method we are hitting Gmail server. sender side we using SMTP protocol , receiver side we using IMAP protocol sender side port number is 587, receiver side port number is 993. To automatically create a case when you receive an email in your application, associate an email account with a top-level case type. When you configure email instantiation, you enable an email listener that monitors this email account.

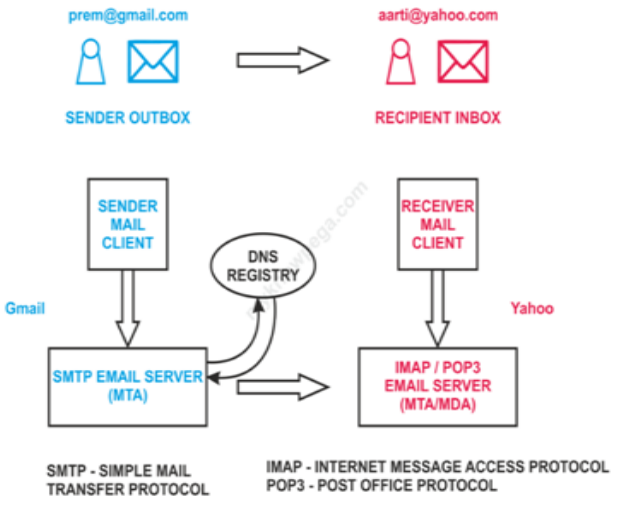

Fig 1. Connection Establishment

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This configuration automatically generates service email rules. To share information about a case with stakeholders, you can automatically send emails from a case, add case attachments to the email, and define the content of the email. To take advantage of advanced email configuration options for managing incoming email, such as using Pega Email Bot to create cases or configuring text analysis to route incoming emails, configure an email channel. This configuration automatically generates email listeners and service email rules.

1.4 Wait Mechanism Using SLA:

It is an advanced flow mechanism that makes your flow to wait for a certain amount of time.The wait time can be directly specified as an expected wait date parameter or Can depend on case status of other dependent cases.You can configure a workbasket in the wait mechanism, so that the case waits the flow reaches the wait. Wait mechanism means we specifing one particular time limit to perform the task. This mechanism is used to instruct the system to wait for a specified time period. SLA means service level agreement which means the suggested time to complete the task.

1.5 Change Stage Mechanism:

we can use the Change Stage Mechanism to move a case to a different stage in the case life cycle. By revisiting or skipping a stage, we can support out-of-sequence processing in a case. At run time, open assignments are resolved before the case leaves the current stage. All processes that originated from the stage, including supporting processes and excluding spin-off flows, are stopped.

1.6 Case Life Cycle:

Track and resolve your cases in a convenient and facilitated way by defining the case life cycle that represents a business model. You can define the life cycle as smaller modules that match the elements of your business process. Every business process have life cycle it divided into stages. Employee safety and business continuity tracker have four stages.

1.6.1 Stage 1: Initial Assessment: When user succesfully logined with SSO authenticaion, user will navigate to the portal based on the AccessGroup. Then they proceed to Start new assessment. if the user will enter email id. System will check email id already done Survey or not. if else it will go capture screen if the new Attempt it will go to another decision which will check HR or not.. If not HR it will go to employee and attach the new content and will go to capture Screen. If the employee risk is high or covid confirmed one new case ID will generate and one request will raise to IT service request team. then using email integration mechanism one mail will trigger to that particular employee and his manager.

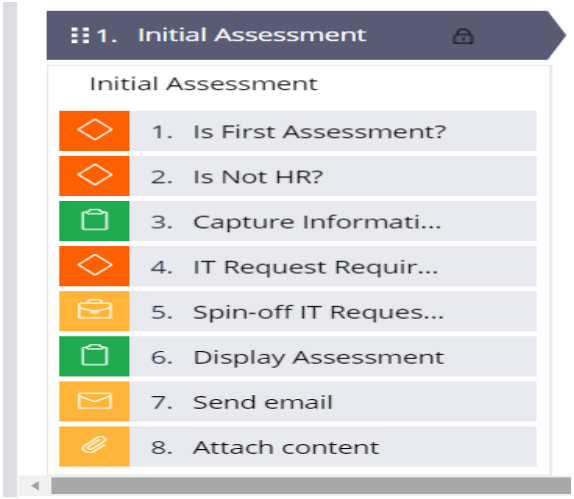

Fig 2.

1.6.2 Stage 2: Manage: Once the employee completed the survey , that person risk is high or covid confirmed. After 5 business days the system trigger one mail to take the survey again because it need update the system will wait 5 business days using wait mechanism. wait mechanism means we specifing one particular time limit to perform the task. This mechanism is used to instruct the system to wait for a specified time period. SLA means service level agreement which means the suggested time to complete the task.

Fig 3.

1.6.3 Stage 3: Monitor: After 5 business days the employee need to take the survey again, if the person risk status is changed that particular module

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will complete, the system moves to next module that 4th module otherwise the employee risk status is not changed again the wait mechanism instruct the system to wait 5 business days. change stage mechanism module no 3 we are using change stage mechanism which means moving case to different stage.

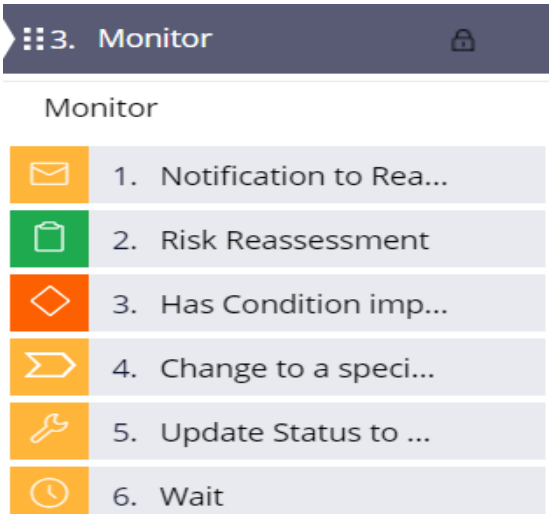

Fig 4.

1.6.4 Stage 4: Verify: If the employee once completed all the modules means they can reenter the work , this module helps the healthy employee to directly come to the office.

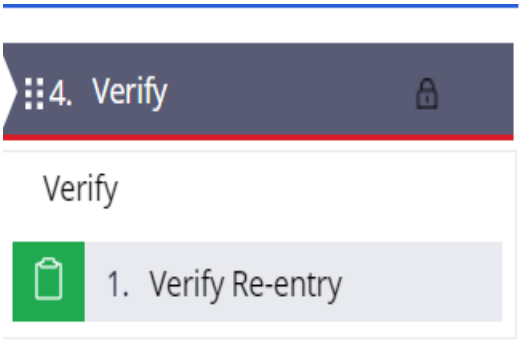

Fig 5.

1.7 Privileges:

One kind of authentication, In runtime if we execute the flow , the system will check is there any privileges or not, if yes the person can access the flow, if not the person can't access the flow. It is a one kind of security. Privileges also called as granular control part. A privilege is an application-specific access control element associated with a class and access role. A privilege rule is an instance of a Rule- Access-Privilege rule type. A privilege name is the second key part of a privilege rule.

A privilege rule only names a privilege; it does not convey the privilege to anyone. privileges means authorized users only can access the portal. our project in the system dashboard manager or admin can perform some necessary actions. They have some privilege to access the portal.

V. FEATURES OF THE APPLICATION

- Enable employees to notify their employer of their health status.
- Take action as each employee's status changes.
- Manage employee availability for on-site or remote work.
- Track how many employees have been exposed to the COVID-19 virus, tested, or self-quarantined.
- Help healthy employees reenter the workforce.
- To provide support of electronic gadgets like Laptop,mouse,etc., to the employees.

VI. ADDITIONAL FEATURES OF THE APPLICATION

Employee safety and business continuity tracker include several additional features.

1. IT Service Request:

If the team get any request means they will process the request , update and notify to the customer this is one separate process in this application. We measuring the employee safety that is risk based on the few factors high risk, low risk, confirmed ,If the employee tested positive the system is asking to upload the positive certificate. If the person risk is high or confirmed, in the work from home if the employee need anything like laptop or internet.

One request will raise to IT service request team. In this process the manager and the employee can track the product in live mode. In real time scenario, the employee need to contact the manager if the they need anything, that manager need to contact the team. The manager & employee they don't have any update regarding the request.

2. Emergency Insurance Claim:

If the employee tested covid positive, that emergency situation if the employee need any medical claim ,the employee need to contact the manager that manager need to contact the

healthcare team then the employee must upload all the supportive bills then only the employee can get the claim this whole process will take huge time, the manager or admin can't track the background process. But our application we can the entire process, if the employee need any insurance claim one request will raise to healthcare team.

3. Leave Management:
This application enables the employee to apply leave to all the self quarantined employees, re-entered employees and unhealthy employees. If the employee applied leave using this application means one email approval will sent to the manager or admin also, we can track all the leaves taken by the employees, this feature enables the leave claiming option.

4. Vaccination Claim:
The company's are recently introduced the vaccination claim to all the employees, if the employee want to take the vaccine the company give allowance to all the employees.

VII. RESULT

The Employee safety and business continuity tracker was tested on several different scenario's. it is proposed with different methods. The results were highly encouraging. The proposed system performs pre-processing on the risk scenario's in order to remove the complexity. Feature extraction is performed from the bit representation, which gives pretty decent classification.

The proposed system is advantageous as it uses fewer features to train the decision strategy, which results into faster convergence (less time for training). The advantage also lies in less computation involved in feature extraction, training and testing.

VIII. CONCLUSION

The project entitled "COVID-19 Employee safety and business continuity tracker" has been successfully completed and implemented. It also provides the necessary requirement as per the company needs.

The system provides maximum user interaction and flexibility. It clearly gives the client a competitive advantage tool that would help improve the process of service providing. A testing and validity check has also been carried out in different formats that specifically define each transaction.

Once the testing of whole system has been with a data and the various outputs obtained are according the requirements; the efficiency of the new system "COVID-19 Employee safety and business continuity tracker" was found out to better than existing manual system in all respects. The software user guidelines which are provided make the user to access through the correct path. Handling seems to be very easy and efficient.

Finally it acts as a user friendly, advantageous and is of easy to exchange the data of mobile. System computerization helps the organization to change according to the modern trend. Since the requirements may increase in future, the system can be easily modified accordingly, as the system has been modularized.

The future expansion can de done in a concise manner in order to improve the efficiency of the system. It provides quality assurance for every request of the customers. The system is designed based on the objectives prepared in the analysis phase of the existing system. The system is designed to be user interactive and user friendly. It reduces all the work with accuracy and reliability.

The system is highly flexible, suppose if we need to change anything we can do easily the system is highly secured & authenticated A new tool certain is under process which will have the drag and drop options which help the users generate reports by themselves and it is considered to be a major enhancement for the application.

This project is designed with the future in mind. Due care has been taken to assimilate the needs for future development. The software is constructed along the lines suggested by the users. This project is designed with the future in mind. Due care has been taken to assimilate the needs for future development. The software is constructed along the lines suggested by the users.

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