

INTELLIGENT TRAVEL AND EXPENSE CLAIM- ITRAVEL

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ABSTRACT

A home automated like electrical or electronics manufacturing system had a large team of field support engineers. As there is too much work pressure, large amount of their time was spent on field handling such as maintenance and repair of improper things around. Sometimes they did not even return to their respective offices for few days in row or weeks. That is why there is delay in claiming the travel expense in a timely manner. Half of all businesses claim are inefficiently processed this is biggest challenge when it comes to managing travel and expenses. Keep away with paper and spreadsheets and let technology digitize the entire process for you. After a lot of brainstorming, it was decided to develop an mobile application as Intelligent Travel Expense Claim system i.e. iTravel. iTravel will leverage the geolocation capabilities to automatically create an expense claim for the engineer. It will allow engineers to check out from their current location and check in to a new location. A location is usually a customer location, office or their respective homes. At day end or during working travel hour, the engineer will now use iTravel to edit all the movement captured using this process and automatically submit a claim. Capture all travel and expense spend in one place to improve control. Once you can see what you're spending, you'll be able to make better decisions. The amounts are calculated on the basis of distance covered. These distances will also be computed from Maps API. This will save the money and time . The solution has to be developed for mobile application .That is in more demand and highly used by mass and can be made useful for the engineers and employee using IBM Worklight Studio and will be deployed on IBM WAS, MYSQL, and Worklight Server. The target device will be an Android Phone. The development will follow the IBM's Rational Unified Process

KEYWORDS: Travel expense, Online Web service, Geo-location, Maps, API Adapters, Automated Claim submit

INTRODUCTION

Today mobile phones are used in large by people all around the world .As more employees prefer to use mobile devices in the workplace, organizations allowing them to use their own mobile devices for business purposes that is in indeed travelling and expense claim . Also on-demand fast, easy service which is portable with usage of mobile application to employees. And we've never much cared for manual expense claim entry but there was use to be a manual expense report generations and processing. Employees will get claim amount back only after the appropriate documentation has been submitted, reviewed and receipts approved online through some procedures and the original receipts have been reviewed. That seems when white goods manufacturing giant had a large team of field support engineers. They do have lots of work on travel and they even don't return to office for few days, weeks or months then led to delay in claiming the travel expense in a timely manner. In many cases business travel expenses represent the second or third largest cost in the company (that depends on the industrial sector of the company). German business travelers spent around 48.2 billion euros in 2013 on 171.1 million business trips. This is an increase of about 3% compared to the year 2012 [2].

So after lot of brainstorming we came across an idea of a mobile application for travel expense claim in automotive way. Get quick access to all travel and expense data also reduce manual routines, increase employee satisfaction, realize a rapid return on investment by streamlining your travel planning and expense reimbursement processes.

In this globalized world, frequent travels between multiple locations is the norm. In these circumstances, enterprises need to stay on top of the itineraries and expenses as an improper travel planning can result in productivity loses and missed business opportunities. Additionally, cumbersome expense claim processes can result in both employee dissatisfaction and higher expense processing costs. Hence, travel & expense management has become a critical business function in enterprises today.

We provide the solution not only for employees but for managers and companies/organization too. By using Worklight Studio keep target device as Android Phones means using the solution employees save significant time by easily creating and submitting accurate, in-policy expense claims. The Managers can easily review, approve, process and audit expense claims – providing them with control and visibility into travel & expense claim (T&E) spending. This intuitive, user friendly solution will help to decrease the expenses by providing new ways to visualize these costs and full decision support, while employees will receive in a fast manner their money back.

LITERATURE SURVEY

Allyson Bartman-Gatt [1] CALTREC (California Travel Expense Claim System) was system implemented with objective of replacing a process that was being done manually, that is, producing a Travel Expense Claim document, which is a physical piece of paper to streamlines the process by formatting and printing the claim and storing personal claim information on a database . Also, claims stored electronically could be passed around electronically, reducing the paper flow among destinations. A second new idea inspired by CALTREC is to automatically generate account coding to individual expense items on claims. This data is currently being assigned by hand, then key input into accounting systems. Before that it was paper based and completely manual and even record was on document like once a Travel Expense Claim submitted to the claimant's supervisor for approval, then

forwarded on for further auditing. Complete Travel Expense Claims are subjected to two levels of which would take year to get claim amount for employees [1998] Zeki Bozkus [2] The claim process of employees will be reimbursed only after the appropriate documentation has been submitted, reviewed and approved online and the original receipts have been reviewed. Before processing, all supporting documents (original receipts, conference events schedules, etc.) must be submitted with a printed copy of the Expense Report. Then a web based application which was rated to two and half star. In this a username and password were given to each employee of a company to login. The data collected concern employees' travel and entertainment expenditures. A web interface has a menu allowing the employee to choose the expense topic i.e. food, transport, communication, etc. All the data collected from employees will be sent and stocked in a database, allowing decision, statistics, etc. Many such new web applications require that a user be able to interactively explore these databases over the Internet or an external network .As soon as some expense data will be sent, an e mail will arrive to the decision maker for the reimbursement. This task is tedious and should be automated to increase the productivity.

Even there is loss of control since data hosted by third party. Claims can be made on weekend and holiday purchases proper airfare, improper mileage, lodging and meals claims information as also it is filled by employee. Expenses Duplicate claims across web, Systems Expenses submitted with missing receipts Requester Expenses submitted by ex-employees. Also large database storage for receipts image and all related documents.

Tobais Lenz [3] In order to define the building blocks of a holistic business travel assistant use cases which typically occur before, during and after a business trip were created and analyzed .The services range from route planning to the travel expense accounting.

EXISTING SYSTEM

The hand written document or manual way like spreadsheet and database were having drawback of late submission. Time Required is more for entire process. The claim process of employees will be reimbursed only after the appropriate documentation has been submitted, reviewed and approved online and the original receipts have been reviewed. Before processing, all supporting documents (original receipts, conference events schedules, etc.) must be submitted with a printed copy of the Expense Report. Then a web based application which was rated to two and half star. In this a username and password were given to each employee of a company to login. The data collected concern employees' travel and entertainment expenditures.[3].

Receipt Loss or No receipt Examples of fictitious expenses : Charging for items used for personal reasons (gas, groceries, hotels, etc.). Billing for travel and expenses that never materialized . Collusion among employees who both bill separately for travel or mileage reimbursement when they traveled together. Outright falsifying or manipulating receipts Inflating business expenses can be found when employees: Claim meals and entertainment reimbursement that not reimbursable Add tips to reimbursement when tips were already included. Add tips to their reimbursement copies that were greater. Use inflated mileage totals when seeking reimbursement for auto travel.[3]

PROPOSED SYSTEM

Our app Itravel is providing user with their desired claim amount on time .Also on move user can access see last claim , update claim amount have track on location too at anywhere in the

world .The application is designed using JQuery ,Java Server Pages, html and MySQL database. The refined version facilitate store, capture location calculate distance and provides better automated claim amount. The functionality of this system can be extended by providing services like status reports and statistical data maintenance, map lookup.

SYSTEM ARCHITECTURE

Employee needs to have his/her account with user id and password to login in our hybrid app The HTML5 based mobile web application is loaded from Work light Server. It communicates the current location along with the operation (i.e. check-in or check-out) to the server for recording the details to eventually generate the expense claim. A SQL adapter stores user's check-in/check-out details in the database; queries database for all check-in/check-out details since the time of last claim generation for a user, etc. The database in DB2 holds the "check-in/check-out details" and "claims" tables and performs the actions requested by the adapter viz. a) inserting new check-in/check-out detail record, and b) querying check-in/check-out records, etc. HTTP adapter leverages Google Maps API to compute distances between two points using latitudes & longitudes. This information is subsequently used to compute reimbursement amount.

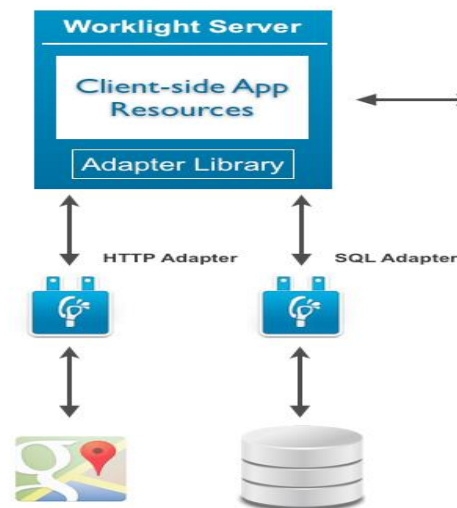


Figure 1: System architecture of intelligent travel expense claim app.

FLOW OF EXPENSE CLAIM ON TRAVEL

The expense management mobile web app should automate the process of planning travel and then submitting, routing, processing and reimbursing expense reports.

For Check In / Check Out refer figure 2:

- Smart phone obtains the latitude and the longitude of the current location using the GPS service of the smart phone.
- This information is sent to Worklight server. Server computes minimum and maximum latitudes & longitudes to ensure that these cover a 100m area around the current location. This is done using Haversine Formula as described in a later section.

- c) Using minimum/maximum latitudes and longitudes, the location is obtained from the location table. If there is more than one location is found, then the nearest location to the user location is taken.
- d) Using the location obtained at step (c), a check-in or a checkout detail record is inserted in the required table(s) in the database.
- e) The user is informed about the successful operation. In event on a failure, user is prompted to re-try the operation.

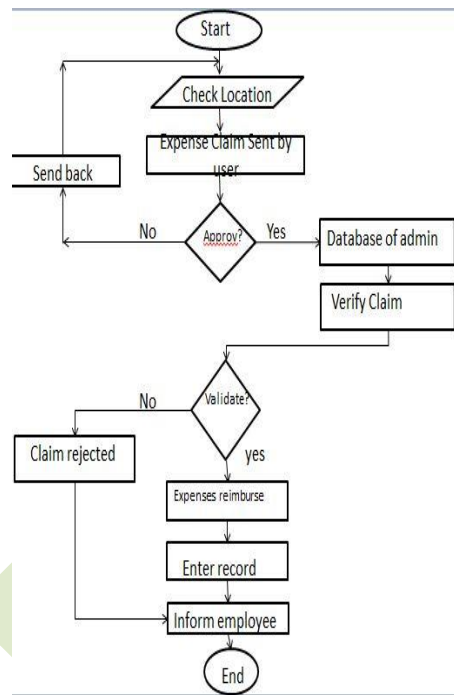


Figure 2: Flow Of Proposed System/ Modules Of the proposed System

For Expense Generating and claim refer figure 2:

- a) Smart phone pulls all the claim records generated by the Worklight server.
- b) User is allowed to edit the line items.
- c) Finally user submits the claim. Up on submission, a new claim record is created in the database.

CALCULATING DISTANCE

The Haversine formula is an equation important in navigation, giving great-circle distances between two points on a sphere from their longitudes and latitudes. These names follow from the fact that they are customarily written in terms of the haversine function, given by $\text{haversin}(\theta) = \sin^2(\theta/2)$. The haversine formula is used to calculate the distance between two points on the Earth's surface specified in longitude and latitude. d is the distance between two points with longitude and latitude (ψ, ϕ) and r is the radius of the Earth.

$$\text{haversin}\left(\frac{d}{r}\right) = \text{haversin}(\phi_2 - \phi_1) + \cos(\phi_1) \cos(\phi_2) \text{haversin}(\lambda_2 - \lambda_1)$$

- d is the distance between the two points

(along a great circle of the sphere see spherical distance),

$$\text{havrsin}(\theta) = \sin^2 \left(\frac{\theta}{2} \right) = \frac{1 - \cos(\theta)}{2}$$

• r is the radius of the sphere,

• ϕ_1 : latitude of point 1 and latitude of point 2

• λ_1 : longitude of point 1 and longitude of point 2

On the left side of the equals sign d/r is the central angle,

assuming angles are measured in radians (note that ϕ and λ can be converted from degrees to radians by multiplying by $\pi/180$ as usual).

CONCLUSION

So here we have an application for user as in employee who can gain claim amount automatically calculated with our application on time. For user of App he/she is Authenticated successfully firstly as his/her information is feed in database of office ,then user can easily check his location. Check in/out details are used to create the expense claim automatically. User save his/her time and can get deserved amount of expense claim.During working hours.This claim information include date time location in form of latitude and longitude start /end location distance between them and cost require to travel with it Location master includes the list of popular locations and their latitudes and longitudes. Thus we provide intelligent travel and automated expense claim app for the users .In the form of mobile app iTravel.

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