Search without Search: Location Based Services.

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ABSTRACT—SWOS System is a project where the goal is to enhance the experience of Instance Instant Alert Messenger which will give alerts before particular time depending on current location of user and tasks to be performed. It will also notify user about the undone work which can be completed within available leisure time without affecting other tasks of schedule. In leisure time, user can search for shops available in local area. In order to allow consumers to retrieve more information such as location of vendors, an advertisement publishing, proposes a location-based mobile advertisement publishing. The application is able to provide vendors not only the ability to edit advertisements, but also the means to publish advertisements to consumers and also a low cost and effective way to implement digital advertisement publishing mechanisms.

The mobile client is implemented using J2ME & JavaScript and the repository and the web client is implemented using php & MySQL. The integration of Global Positioning System (GPS) receivers, WI-FI, GPRS, 3G and Artificial Intelligence (AI) for distance calculation purpose. Depending on current location of the user, GPS will search for the destination. Then it will calculate the distance and with the help of Artificial Intelligence it will calculate the time to reach destination. Also user will not waste his time since his pending tasks can be rearranged in his leisure time. For example, User wants to buy a bat but due to busy schedule user was not able to buy it. So, when user will be having leisure time then GPS will be activated automatically and it will search for Sports Center within the range of user. If it is available then user will able to go there and buy a new bat.

1. INTRODUCTION

We propose SWOS System which will give alerts depending on location of user and tasks that has to be performed. It will notify user about the undone work which can be completed within available leisure time without affecting other tasks of schedule.

One of the most valuable pieces of contextual information for an intelligent mobile application is the user's location. Because of the complexity of realizing location-aware capabilities for cellular devices, location-based intelligence is only now emerging in commercial mobile phone applications. Several factors are contributing to the renaissance of location-based services. The integration of Global Positioning System (GPS) receivers, WI-FI, GPRS, 3G and Artificial Intelligence (AI) for distance calculation purpose. Depending on current location of the user, GPS will search for the destination. Then it will calculate the distance and with the help of Artificial Intelligence it will calculate the time to reach destination. Also user will not waste his time since his pending tasks can be rearranged in his leisure time. For example, User wants to buy a bat but due to busy schedule user was not able to buy it. So, when user will be having leisure time then GPS will be activated automatically and it will search for Sports Center within the range of user. If it is available then user will able to go there and buy a new bat.
2. APPLICATION ARCHITECTURE

We will be using the internet for our main source of usage, which will be used to send the users data and the service of process from mobile to the server and then share their requested information back to the users. SWOS consists of four parts: the repository, the mobile client, web client and a map service, shown in Figure 1.

![System Architecture Diagram]

**Figure 1: System Architecture**

**A. Mobile Client**

The mobile client is used to record and request their location from positioning system periodically and send it through the communication network to the repository. The user can schedule his daily activities and access it any time from the server.

Also an alert can be received before particular time depending on current location and task destination.

**B. The Repository**

The repository includes all the information about the users, sharing maps, and the location-output (Result). Means all the users who signed in the service with their location, a control list that holds daily tasks scheduled by user which are at different places, and a mini-board on the top corner that contains locations with its coordinates.

**C. Web Client**

The web client makes it possible for users to receive the location on the mobile screen and send “Text Message” as alert whenever task is to be performed or if user going in wrong direction while navigating. And also modernize the user about the information.

**D. Map & Positioning Service(GPS)**

The map service part is an agent based which provides both the mobile and the web client with map data. Every time the mobile phone updates the user location in the web-client, it is asking the location of the user from mobile GPS and landmark on the map services. The GPS determines the longitude and the latitude, however the map service is part of SWOS, and it will be supplied by an external source. Then latterly sends to themobile phone.
3, FUNCTIONAL SPECIFICATION

A. Mobile Client Functions

1) SWOS Registration:
To use the SWOS service, the user should register by entering username and password to create registry file. And this registry file will be sent to the Web-client.

2) SWOS Login:
The user is ready to login into the SWOS service by inserting the username and password once the registry file is created and this information will be sent to the web-client in order to determine, whether the user can access the SWOS service or not.

3) View schedules:
After successful login, the user will able to see the schedules arranged by him for the day. Then he can select the task and look for the destination into the map.

4) Add/Delete schedules:
While viewing the schedule, user is able to add some new tasks or also able to delete or postponed some tasks. User can also make schedule for the next days.

5) Select destination & view map:
After selecting tasks, user will enter the destination and view the map to get the direction towards the destination.

B. Web Client(Server)

1) Registration Action:
The web-client receives the registration information and writes them into users table in the repository.

2) Login Action:
When web-client will receive the login information, it will make sure that the user has an access to the SWOS or not by matching the information with once stored in the repository or in the cloud.

3) User Management:
When the user registered to SWOS service, server gets login information and then it adds the new member to the user list.

4) Catching/Update Location:
The web-client receives the co-ordinates of a user location and stores them in repository. The web-client allows the application to update member location, time and distance between user and destination.

5) Alerting Action:
User will get alert before particular time depending upon user’s current location and destination. While navigating, if user goes in a wrong direction and he will not able to reach destination within time then he will get alert.

C. Vendor Functions:

1) SWOS Registration:
To use the SWOS service, the user should register by entering username and password to create registry file. And this registry file will be sent to the Web-client.

2) SWOS Login:
Vendor is ready to login into the SWOS service by inserting the username and password once the registry file is created and this information will be sent to the web-client in order to determine, whether the user can access the SWOS.
3) **Product Advertisement:**
After successful login, vendor can add his shop and advertise available products in the shop. He is also able to display different offers and discounts available on those products.

D. **Map and Positioning Services (GPS)**

1) **GPS Info:**
GPS is a navigational system which provides a reliable positioning and navigation to the user. GPS involves satellites for signalling purpose. It calculates the longitude and latitude of a receiver on the earth automatically.

2) **Search & Replacing Map Service:**
The longitude and latitude on the map services will be established by using this function and the position on the map is substituted by the point in the space.

3) **Scene Location:**
In scene location, the search and replace actions are combined together into an observable object.

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4) **Navigate:**
This will help user to move towards a destination with provided direction. The user view the map, select Destination then system shows number of paths available to reach that place and help him/her to navigate accordingly.

5. **THEORATICAL FOUNDATION**

A. **GPS:**
The Global Positioning System (GPS) is a U.S. space based radionavigation system that provides reliable positioning, navigation, and timing services to civilian users on a continuous worldwide basis—freely available to all. For anyone with a GPS receiver, the system will provide location and time. GPS provide accurate location and time information for an unlimited number of people in all weather, day and night, anywhere in the world. The GPS is made up of three parts: satellites orbiting the earth; control and monitoring stations on Earth; and GPS receivers owned by users. GPS satellites broadcasts signals
from space that are picked up and identified by GPS receivers. Each GPS receiver then provides three-dimensional location (latitude, longitude, and altitude) plus the time.

1) Calculating Positions:
The method of calculating position for the case of no errors has been explained. One of the most significant error sources is the GPS receiver's clock. Because of the very large value of the speed of light, $c$, the estimated distances from the GPS receiver to the satellites, the pseudoranges, are very sensitive to errors in the GPS receiver clock. This suggests that an extremely accurate and expensive clock is required for the GPS receiver to work. On the other hand, manufacturers prefer to build inexpensive GPS receivers for mass markets. The solution for this dilemma is based on the way sphere surfaces intersect in the GPS problem. It is likely that the surfaces of the three spheres intersect, since the circle of intersection of the first two spheres is normally quite large, and thus the third sphere surface is likely to intersect this large circle. It is very unlikely that the surface of the sphere corresponding to the fourth satellite will intersect either of the two points of intersection of the first three, since any clock error could cause it to miss intersecting a point. However, the distance from the valid estimate of GPS receiver position to the surface of the sphere corresponding to the fourth satellite can be used to compute a clock correction.

Let

$$r_4 = \text{distance from the valid estimate of GPS receiver position to the fourth satellite}$$

$$p_4 = \text{pseudo range of the fourth satellite}$$

$$d_a = r_4 - p_4$$

$$d_a = \text{distance from the computed GPS receiver position to the surface of the sphere corresponding to the fourth satellite.}$$

Thus the quotient,

$$b = \frac{d_a}{c},$$

Provides an estimate of (correct time) - (time indicated by the receiver’s onboard clock), and the GPS receiver clock can be advanced if is positive or delayed if is negative.

2) Coordinates format:

The coordinates that are retrieved from the GPS can be represented as one of the following formats:

$$DD°MM’S’S.SS,$$

$$DD°MM.MM,$$

$$DD.DD°,$$

Where D is for Degrees, M is for Minutes and S for Seconds.

3) Calculating distances using coordinates:

In order to calculate the distance between two points where the coordinates of each point is given; an equation that calculates the distance between two points on a circle surface should be used [3]. If the distance between point A (LongA, LatA)
and the point B (LongB, LatB) wanted to be calculated, then the distance in meters is:

\[ D = \text{acos}[\cos(\text{LatA}) * \cos(\text{LatB}) * \cos(\text{LanB} - \text{LanA}) + \sin(\text{LatA}) * \sin(\text{LatB})] * R \]

Where D: the distance in meters, latA: Latitude of point A, longA: Longitude of point A, latB: Latitude of point B, longB: Longitude of point B, R: the radius of the earth in meters.

6. IMPLEMENTATION OF TRANSPOSE-MINIFY

For doing the above mentioned steps the pivotal - appraisal pair is generated for Transpose and Minify functions

- For Transpose (P1, A1) → list (P2, A2)

For reducing (P2, list (A2)) → list (A3)

The Transpose Minify library in the user program first splits the input files into M pieces of typically 16 to 64 megabytes (MB) per piece. It then starts many copies of the program on a cluster. One is the “sculptor” and the rest are “Serf.” The sculptor is responsible for scheduling (assigns the Transpose and Minify tasks to the worker) and monitoring (monitors the task progress and the Serf health).

When Transpose tasks arise, the sculptor assigns the task to an idle Serf, taking into account the data locality. A Serf reads the content of the corresponding input split and emits a pivotal /appraisal pairs to the user-defined Transpose function. The intermediate key/value pairs produced by the Transpose function are first buffered in memory and then periodically written to a local disk, partitioned into R sets by the partitioning function. The sculptor passes the location of these stored pairs to the Serf which reads the buffered data from the Transpose using remote procedure calls (RPC). It then sorts the intermediate keys so that all occurrences of the same key are grouped together. For each key, the worker passes the corresponding intermediate value for its entire occurrence to the Minify function. Finally, the output is available in R output files (one per Minify task).

Figure 5: Sculptor - Serf architecture

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7. IMPLEMENTATION

The main components of SWOS system are client, web server, database and vendors. Clients are the users of system with GPS-Enabled mobile phones and access web server with help of internet where they can view their schedule, select task from list. The task could be location dependent, so when user select destination, system will calculate position, distance between current and destination location and time to reach that place. As user select destination, the system shows paths and help user to navigate. In case, if user is moving in opposite/wrong direction then it will immediately notify user about the same.

The web server provides alarms according to the schedule set by the user and the location. If a user is having an important meeting or any other important task, at location2 now he is at location1 then the reminder will buzz before the meeting time i.e. the time which is required to reach location2 from location1 and he will be able to attend that meeting. So, location-based alerts are provided.

The vendors use text to describe characteristic introductions and images to express appealing looks. In order to allow consumers to retrieve more information such as location of vendors, an advertisement publishing system should be improved to meet the consumers’ requirements. This work proposes a location-based mobile advertisement publishing system, a framework for vendor editing, and location-based service. The system is able to provide vendors not only the ability to edit advertisements, but also the means to publish advertisements to consumers. For vendors, the proposed system provides a low cost and effective

![Figure 6: Block Diagram of System](image-url)
way to implement digital advertisement publishing mechanisms.

the form of list. E.g. Adding location is shown in figure 7.

![Figure 7: Add location.](image)

8. CONCLUSION AND FUTUREWORK
In this project, we proposed a SWOS which successfully solves the privacy issues in existing LBS applications and provides various location based queries. The system uses our novel distance computation and comparison protocol to implement semi-functional encryption, which supports multi-leveled access control. Also, during the whole protocol, unless intended by the location publisher, the location information is kept secret to anyone else. We also conducted experiment evaluation to show that the performance of our protocol is applicable in a real mobile network.

9. RESULTS
In implemented system, we login as ‘admin’ (Administrator) to the system, so as to add location, category (e.g. mall, electronic etc.) and vendor. We can see this information in

Similarly vendor and category can be added. Vendor can add different product information and offer to customer through vendor login as shown in figure 8. The customer can add reminder based on location based on longitude and altitude as shown in figure 9.
Figure 8: Vendor Advertisement.

Figure 9: Location Based Reminder.
References