DSLS Dynamic Skiing Location System Mobile Information Anywhere





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Introduction:

In order to provide information, promotion and location data to different categories of mobile users (mobile phones, PDA's, etc.), especially, but not limited to users in skiing resort areas and cities, a complete software system has been implemented to achieve a unique, applicable, compact, cheap and easy to deploy solution.

This system addresses the information needs of users while they are skiing, tracking, shopping or simply making holiday in their favorite skiing resort or city. The software, in terms of end user usability, is a special navigation software, installable on almost 90 % of mobile devices available on the market and enhanced with integrated information and messaging services. The navigation software, optionally, can also be used along with a GPS receiver in order to have <u>real time</u> location data. If no GPS receiver is used, the location data is exchanged via stationary info gateways, RFID chips or derived from the GSM network cells reachable. The state of the art of this software product, compared to different solutions for such a system, is the implementation of low cost information transactions given by the usage domain, and given by the applied type of networking typology. The main idea is to enable a vast, mobile, distributed, wireless information processing with no added costs for provider, and consequently lower costs for the end user. The herein presented system is dedicated to skiing and tracking resorts, but the same components of the system can be easily configured for other environments like cities or shopping malls, or production and industrial environments.

The system consists of two distinct software components, a client side application for the end user (**DSLS Client**) to visualize, search and browse information on almost any mobile device, and a server side application for the service provider (**DSLS Server**) to control and manage the information and sponsor promotion. The DSLS server serves as an info gateway node.

DSLS clients exchange by default information via BluetoothTM radio link with DSLS server gateways or with other DSLS clients, while DSLS servers communicate among them and accept connections form DSLS clients. The software is small and portable enough to run both, client and server, on a single mobile device. In this particular implementation, DSLS server gateways are located at each lift station and in central or crowded places like cottages or urban areas like cities or streets. The DSLS client networking communication is by default carried out over BluetoothTM radio link. This feature makes the system more attractive for the end user, because no additional bandwidth connection costs arise and because no connection provider is needed. Other networking protocols like WAP, Gprs, MMS or SMS are obviously supported on the DSLS client software if the user explicitly wants to use them.



DSLS Client on Nokia 6600 J2ME 2.0 CLDC1.0

Fig.1 An example DSLS implementation in Alta Badia (Sout Tyrol - Italy) at www.dolomitisuperski.com

DSLS Client Software:

The DSLS client software is a small software, approximately 400 Kb in size, compatible with all J2ME 2.0 devices supporting CLDC 1.0 like mobile phones (Nokia, Ericsson., Motorola) and PDA's. The software includes DpdlTM (<u>www.dpdl.co.nr</u>) to manage dynamically the data transitions and DpdlVMTM to run the software on even smaller devices. Once installed on a mobile device, the software presents 4 distinct modules:

- a) **DSLS-Map** (Main DSLS Navigator Software)
- b) **DSLS-Info** (Information Gateway)
- c) **DSLS-TIS** (Tourism Information System)
- d) **DSLS-Gps** (Raw GPS Decoder)



a) DSLS-Map

This is the main navigation software. It provides a way of visualizing a resort specific map graphically, show up location points like hotels, bars, sporting facilities, etc., and trace lifts, slopes, user searchable skiing paths and Gps data of the user while skiing. If the user uses a GPS receiver, he can visualize his position, speed, altitude, km lifts, km slopes in <u>real time</u>, while if he does not have a Gps receiver, the current position is received each time the user passes a lift gateway or any other DSLS server gateway installation providing location data, RFID-chips included, or even estimated using the current GSM cell available.

Due to the fact that taking lifts is a common and repeated action while skiing, each time a user takes a lift, all information like map data, info content, current position, important alert messages, SMS, e-mails, event calendar, closed lifts etc.) is synchronized on the user's mobile device. As already mentioned, the user can request the above information any time if he accepts to open a Gprs or WAP connection to the DSLS server remotely. DSLS Map supports different kind of maps and includes a calibration procedure so that it can be used to visualize any standard scanned city or skiing resort map. In any cases, cashed map images from GoogleTM Earth can be requested from the user at any physical DSLS Server gateway or through a Gprs connection to the remote DSLS Server.



Fig. 3 Menu Options

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DSLS-Map main features:

- Search and visualize lifts, slopes, ski tours, cottages, shops, hotels, restaurants, etc.
- Visualize the lifts taken a Given day
- Visualize all lifts/slopes taken a given day with a good approximation of km lifts, km slopes and altitude profile (this feature is intrinsic by design and does <u>not</u> require a Gps receiver)
- Visualize the position of another user if he enabled his profile for you
- Visualize <u>real-time</u> position, speed, altitude, km lifts, km slopes if a <u>GPS receiver</u> is used
- Search for destinations and visualize the shortest path from current position (also traffic info)
- Search and request a new Map from Google[™] Earth with the DSLS Google Gateway option (via Bluetooth and Gprs)
- Add user defined waypoints and icons to the map
- Share DSLS maps and waypoint positions with other users
- Send/Read SMS to other users
- Send/Read e-mails on the most popular web mail servers (<u>www.hotmail.com</u>, <u>www.yahoo.it</u>, etc.)
- Post all camera pictures at a given DSLS Server gateway and have the possibility to download them at home again on the local PC
- Automatic lift and slope recognition based on recorded trail gps data with menu selection export and Google EarthTM export options
- Open Source Programming Interface with Dpdl[™] API allows easy customization





b) DSLS-Info + c) DSLS-TIS (Tourism Information System)

These two modules offer the possibility to provide to the end user a vast set of easy to handle and deploy information. Again, this information is either updated automatically each time the user passes a DSLS server gateway (Lift, crowded urban areas, etc.), or the user can request the information update via Gprs, Wap or MMS.

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c) DSLS-Gps

This module is a basic, low battery consumption and easy to use GPS decoder offering the possibility to use it whenever location information is needed. All data recorded can than be viewed in DSLS Map by loading a scanned and calibrated Map image or by requesting the map from Google EarthTM

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Alta Badia Skiing Resort panorama



Equipment used for the specific implementation of this DSLS System:

- Nokia 6600 Mobile Phone (J2ME 2.0 CLDC 1.0)
- DSLS Client Software
- USB Bluetooth dongle
- Hamlet GPS receiver
- A Map image selected, scanned and calibrated (5 editable parameters)



CONTACT:

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