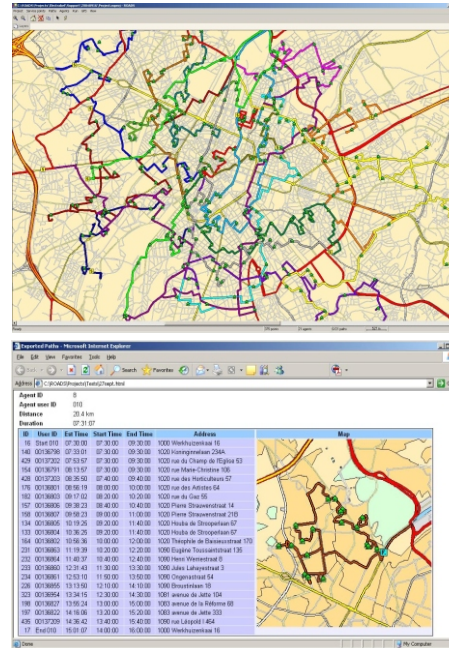


Application Example

A service organization delivers service to hundreds of clients spread around Belgium using 60 service engineers. 40 engineers start from one central point and 20 engineers from their homes. Each service engineer (depending on his skills) can perform different tasks at the client location. The service involves 8 different tasks. The operation is limited by the 8-hours legal working day and requires equal workload distribution between service engineers. The PlanVidia system automatically determines the optimal amount of resources taking into account all operation constraints simultaneously. Within a few minutes the dispatcher knows what resource (how many and which service engineers) are needed to perform that day's operation. The optimization process takes into account appointments, delivery priorities, service time at the client, skills of service engineers and other parameters specific to customer operation (business logics).

PlanVidia makes the field service operation more cost effective, it provides transparency to the operation and increases the quality of the service. The PlanVidia system can support the planning of the daily operation and can be used for the simulation of mid-term and strategic operations (e.g. monthly planning, resource assessment, market growth analysis, acquisitions, etc.).



Dynamic Planning (integration with Track & Trace)

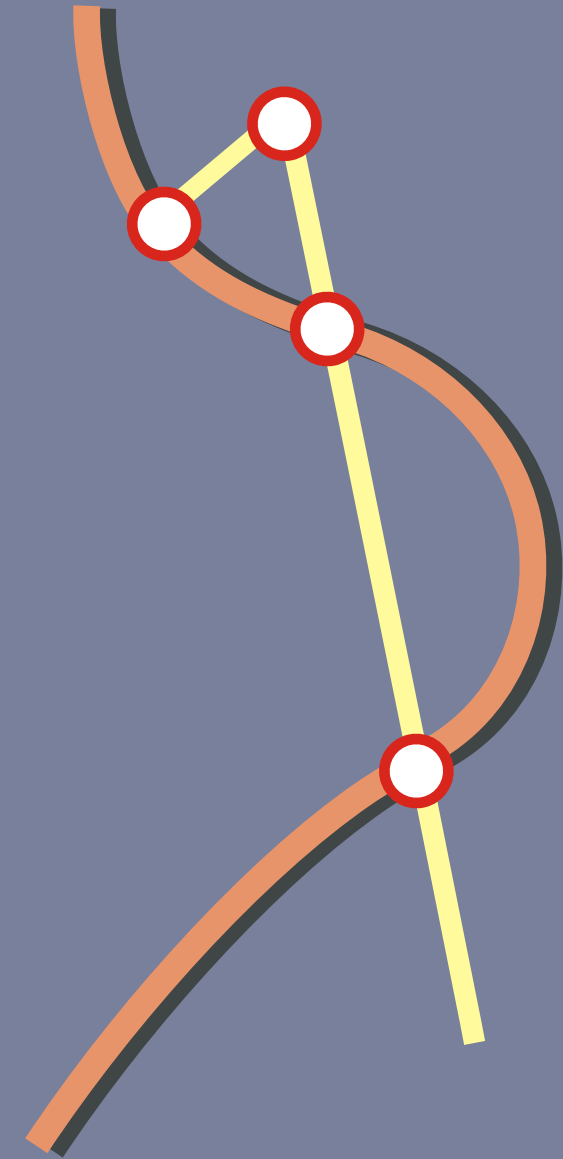
With PlanVidia dynamic planning you Plan -> Communicate -> Monitor and Plan again. Dynamic planning allows to consider last minute changes and unpredictable factors as traffic jams and delays impacting your operation. The communication and tracking of the resource support standard track & trace solutions (GPS location and bi-directional communication).

The PlanVidia system is easy to integrate with existing IT infrastructures (SAP, Oracle, Access....) through open XML interface. The system is scalable to PDA's and portable devices allowing transparent operation in a distributed environment using different devices and different operating systems.

Capvidia NV
Research Park Haasrode
Technologielaan 3
B-3001 Leuven
BELGIUM

Phone: +32 (16) 40 27 47
Fax: +32 (16) 40 32 71
E-mail: info@capvidia.be
www.capvidia.com

PLANVIDIA



MOBILE WORKFORCE PLANNING SYSTEM

PlanVidia

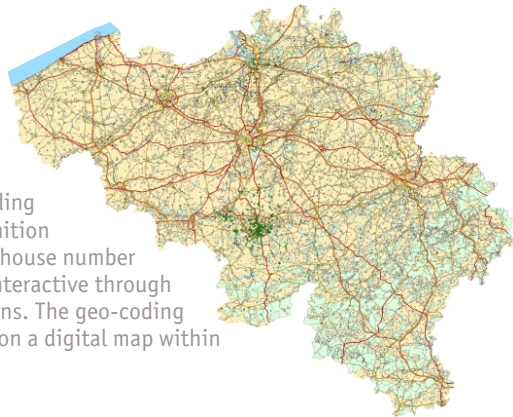
The PlanVidia system opens new perspectives in the planning and optimization of company resources. The system has been designed with focus on large and complex service organizations operating in widely spread geographic areas. Successful service operation means providing the right resources at the right place at the right time (within SLA).

PlanVidia instantaneously provides the dispatcher with an optimal solution for the most complex operation. The system automatically determines the minimum required resource for daily operation involving hundred of servicepoints taking into account geographic locations, opening hours, skills of the service team, appointments, customer preferences, legal working hours and legal compliances (e.g. SLA's). PlanVidia supports and simplifies the dispatcher decisions with an interactive graphical interface, while ensuring through it's powerful algorithms, minimal operation cost, minimum resource and controllable (predictable) quality. PlanVidia main functions (forecasting - planning - scheduling):

- Workload planning and forecasting (long/short time horizon)
- Optimal planning (workload distribution, within legal hours, limited over time, etc.)
- Optimal operation planning and scheduling (within customer business logics)
- Wireless field force management (dynamic planning, field feed back)
- Support of business decisions (investments, market expansion, variable SLA's)
- Performance indicators, analysis, monitoring (management tools)

Geo-coding

The geo-coding automatically converts an address (e.g. 1000, Rue Royale 15) into a uniquely defined point on a digital map (North 50°50'52", East 4°21'46"). The geo-coding algorithm automatically resolves address definition inconsistencies as spelling errors and missing house number information. The manual geo-coding is fully interactive through graphical interface using drag & drop operations. The geo-coding module correctly locates thousands of clients on a digital map within sheer minutes.



Scalable Vector Graphics

The PlanVidia's graphical engine is using the latest .NET technology providing flexibility and optimal performance on local and distributed system configurations. The vector based graphics ensures clear and sharp visualization independent from the map scale and amount of details. The graphical information is organized in thematic layers and visualized using scale sensitive concept for the optimal display readability. Each graphical object can include both static as dynamic attributes.

- Fast, scalable and detailed graphics
- Multilayer visualization
- Access to object properties with simple mouse click
- Dual monitor support
- Customizable user interface
- Scalable to PDA's and portable devices

Optimization Solvers

The heart of the PlanVidia system is the multi-parameter optimization engine. The optimal solution is sought globally using the real network of roads (MultiNet Tele Atlas) considering time constraints and business logics defining the operation. The optimization is performed in global sense in the three domains simultaneously:

- Time domain (respecting appointments, opening hours, working hours, breaks, etc.)
- Space domain (directly on the network of roads including all traffic regulations)
- Business domain (legal and operational constraints)

The optimization process starts from the description of the service operation. This process is called parameterization. We use attributes to describe service points (clients), technicians (agents) and constraints of the operation (business logics). E.g. the available human resource will be defined as number of technicians each having the following attributes:

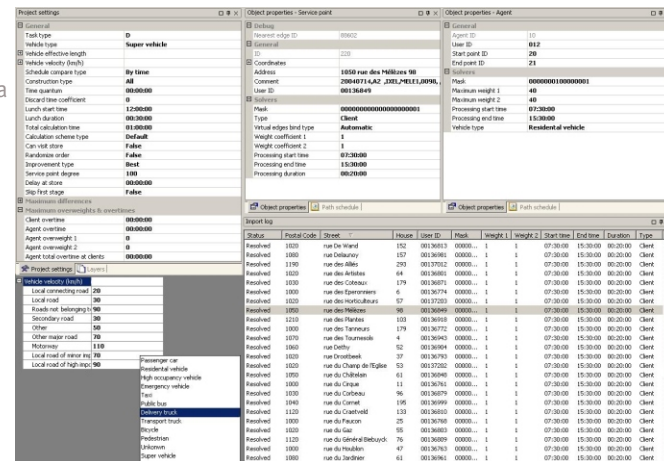
- ID / Name
- Start location (address)
- End location (address)
- Skills (all skills technician can perform)
- Working hours (start, end, lunch, etc.)

A similar parameterization is used to describe clients (service points). The information is entered into the system using standard XML templates.

Optimization Criteria

The optimization criteria are defined as hard and soft constraints controlling the solver:

- Resource minimization
- Cost minimization
- Operation within legal working hours
- Balanced work load
- Equal work load
- Limited overtime
- User specific criteria



Daily operations can be planned within just a few minutes and re-planned (dynamic planning) every 1-2 hours to adjust the operation to possible delays (traffic), to include new service calls and other unpredictable parameters not considered in the original planning.