Managing the mobile field force

Project Brief:
Kingston Communications

Managing a mobile field force efficiently is very complex. Scheduling decisions have to meet multiple and often conflicting priorities, based on rapidly changing information from a range of sources. IPL has equipped Kingston Communications with a world-class solution to this technically difficult business problem.



BUSINESS OBJECTIVE

In 1999 Kingston Communications, an innovative regional network operator, acquired a licence to extend its network to the whole of the UK. The company needed to ensure that its field force management, like every aspect of its operation, was at least as efficient as that of its competitors in this new market.

Kingston has a multi-skilled field force which deals with both the repair of network faults and the installation of new equipment. Efficient scheduling of the field force is a very complex problem. Some jobs can be planned in advance, while others arise urgently, without warning. Some jobs can be done during the hours of darkness, while others need daylight. Some require an appointment with the customer. Many customers have restricted site access times. Where customers have contractual Service Level Agreements (SLA), the SLA will have a bearing on the necessary fault response time. Work needs to be scheduled with consideration also of the field force's itineraries, travel time and stores visits.

Formerly, Kingston had addressed this difficult problem with a Dispatcher and a Whiteboard. Expansion of Kingston's operations, and new regulatory requirements meant that an automated solution was required.

Kingston came to IPL for that solution, because of our track record of developing business critical operations support systems.

IPL'S SOLUTION

IPL developed the Field Management System (FMS), a 3-tier software solution based on 4GL, object oriented and RDBMS technologies. The FMS is widely distributed, over multiple servers, office client machines and mobile computing systems carried by the field force.

The FMS guides customer care representatives through a fault reception process, which ensures that as much diagnostic information as possible is acquired during the first contact. To assist with this, the FMS integrates with line testing equipment and with customer records databases. The FMS helps the representative to offer an appointment for a repair visit, based on knowledge of the planned field force staff availability, and then automatically passes the fault report on to the appropriate department for action.

The FMS also extracts installation requirements from the database of Kingston's customer care system (which itself has IPL software embedded in it).

The FMS dispatch function maintains a detailed model of the field force's location (from GPS trackers), status and planned work. It presents the engineers' known locations, together with dispatched and upcoming jobs, overlaid onto Ordnance Survey maps. Where engineers' location becomes uncertain over a period of time, the FMS shows this by a gentle fading of the "engineer" icons.

Assignment of jobs to engineers can be done manually, automatically, or by a combination of the two.

The automatic scheduling function of FMS is remarkable. The number of possible schedules is immense, and far too large for an exhaustive check of every one. The FMS has to operate very advanced heuristics to ensure that all of the factors mentioned under “Business objective”, and more, are considered. The FMS first eliminates the solutions which would violate hard constraints such as safe working times. Then it searches the remaining solution space for the minimum cost solution. Kingston’s managers can assign varying “costs” to all of the factors considered, tuning the FMS’s choices to reflect Kingston’s business priorities. The FMS finds the minimum using heuristics based on the principles of “hill climbing” and “simulated annealing”.

To support Kingston’s management and its regulatory obligations, the FMS also produces detailed statistics on the operational performance of each individual and team involved.

MANAGING THE PROCESS

Kingston selected IPL by competitive tender. IPL assigned a full time team of software specialists, with dedicated project management. The team began work by evaluating a number of implementation technologies in the light of their analysis of Kingston’s requirements.

The team was able to recommend the use of software technology that was significantly cheaper than Kingston had anticipated, and which proved to be entirely appropriate to the task.

Working at IPL’s purpose-built software development facility in Bath, the team had the first version of the FMS installed at Kingston and ready for operation within six months of starting work.

THE OUTCOME

The FMS has seen continuous use for many months, and has become a critical part of Kingston’s business systems. It has been very well received not only by Kingston’s operational staff, but also by the IT department.

The IPL project, which has met all its delivery dates on time and ahead of operational need, continues to extend the FMS to address the diversification and expansion of Kingston’s very dynamic business.

The Dispatcher is still there, but doing his job better and faster, thanks to IPL.

FURTHER INFORMATION

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