STEPHEN E ARNOLD MARCH 7, 2008

Google: Solving One Problem, Creating New Opportunities

In San Francisco in 2007, I saw a Google shuttle bus. There were five or six people on it. I watched as the driver peered at a GPS unit and turned down a side street—a very narrow sidestreet buses avoid. I haven't lived in San Francisco since 1991, and I didn't think SFMTA (San Francisco Municipal Transportation Agency) was organized enough to offer personalized service. "Regular" Buses in San Francisco ply the main streets. Sticking to routes and schedules oddly disconnected from the needs of those wanting to go "green" by riding public transport. In "the city by the Bay", transport flexibility means a bicycle, shank's ponies, or a taxi. Forget automobiles. There's no place to park unless the parking gods smile on you.

I happened across a Google patent application named "Transportation Routing." If you want to read the document yourself, its application number is US20060149461. You can download it from the U.S. Patent & Trademark Office by pointing your browser to http://patft.uspto.gov/netahtml/PTO/search-adv.htm. (Pay close attention to the USPTO search syntax, please.)

Google's engineers devised a system and method to operate a "smart" shuttle service for its employees. The invention allows a Googler to request a shuttle ride via a mobile phone using SMS (simple message service). The "transportation routing" system receives the request and matches the Googler's location to the closest shuttle. The system figures out a route and wirelessly updates the shuttle driver's GIS system and sends an SMS to the Googler with the time and coordinates for the pick up.

This invention doesn't solve the famous traveling salesman problem. Google's approach doesn't have the jaw-dropping impact of the company's work to reach beyond databases to dataspaces. And the patent application lacks the polish of the five patent applications that spell out Google's potentially revolutionary Programmable Search Engine. Take a look at one of the figures in the patent application. When I saw this diagram, I thought that the work on this invention was hammered out over lunch in the Google cafeteria with Tony Bennett crooning and a napkin serving as a convenient creative canvas. When I wrote Dave Girouard, head of Google's enterprise unit, he didn't answer my e-mail, which is standard operating procedure for Google when I ask questions. Here's the diagram. Judge for yourself:

This "napkin" invention – my description, not Google's – contains several interesting components. In my opinion, no single element of this patent application is completely new. What's unique in my opinion is the combination of elements, which as explained by Google, become a quite innovative invention. First, the inventors – Henry Rowley and Shumeet Baluja – incorporated two "smart" components into their invention. The first is a subsystem that is responsible for figuring out how to move the shuttle among the Googlers wanting rides. The second subsystem sucks in data about traffic, user information, and values from the Navigation Point Generator and produces routes. Other

components in the system notify the rider and the driver, generate log entries, and perform other housekeeping chores.

The second surprise in the invention is that matching riders to shuttles is one use of the invention. The language of the patent application leaves the door open for Google to use this invention to route other types of traffic. Think trucks, airplanes, even data. Furthermore, the diagram's "napkin" art shows the routing information moving from a base station to a satellite. The language of the patent application and the diagram make explicit Google's system and method for routing can operate on vessels, aircraft, and satellites.

How does this invention fit into Google's enterprise plans? Had Googler Dave Girouard answered my e-mail, I would have been able to include his response in this column. Alas, Google pretends I don't exist. My solution to this radio silence is to use Google to find out what Google is doing.

A bit of sleuthing revealed that Google has extended its shuttle routing operation to its offices in Korea. This is useful information, but the most intriguing extension of Google's transportation routing technology is the agreement with the State of New Jersey, a state with one of the largest public transit systems in the U.S.

Dubbed Google Transit, the new service displays departure and arrival data for individual travelers. Google Maps provides a graphic representation of the routes. NJ Transit's Kennet Pringle said on March 17, 2008: "For visitors to the region or the occasional rider who is less familiar with New Jersey's public transportation options, it gives them a starting point for learning about NJ Transit and is a key, too, for attracting new riders to our system."

Google's Maps, transportation routing, and personalization capabilities offer transportation agencies significant cost-reduction opportunities. Most bus routes are inflexible. As a result, many buses run empty or with a handful of riders or experience severe overcrowding. In Louisville, Kentucky, most transit authority buses run without passengers, wasting taxpayers' money and incurring unnecessary costs.

Adding a flexible shuttle service to the NJ TRANSIT system or to any transit authority wanting to deliver more efficient, flexible, and economical public transport may make the Google service attractive. In fact, the potential for reducing pollution ("going green") and slashing operating costs may make Google's transportation capability an appetizing service to mass transit operators.

But there's a bigger enterprise play than Google's getting in cloud-based, flexible routing. The system makes it possible for Google to offer commercial enterprises a cloud-based service to take control of broader logistics functions. These might be as basic as moving executives from Point A to Point B or as sophisticated as determining more efficient ways to handle inventory shipments, maximize capacity for data movement, and shifting from on-premises routing systems to cloud-based services.

How does two engineers solving the problem of moving Googlers around the San Francisco area morph into global logistics and data routing? The answer to this question reveals one of Google's resourcefulness. One problem is solved in a clever way even if it doesn't create a revolution comparable in impact to Einstein's Theory of Relativity. Google's approach is to use techniques, algorithms, and engineering basics in a fresh and clever way.

Google solutions solve the problem at hand. But this is what I call the Google "secret sauce": the Google solutions are picked up, recycled, and repurposed. Let me give you an example.

In the "Transportation Routing" invention, Google Maps appear as a sub system called "Mapping Data." There's also a subsystem that converts data for the particular device requesting the information. This is a "Response Formatter." Dozens of organizations have these capabilities. What sets this invention apart are the two "smart" components that figure out what transportation resources are needed and how to route the shuttle to avoid the inevitable traffic jams.

How does the invention deliver these results? It's evident from the patent application that computational intelligence is operating in Navigation Point Generator and the Navigation Route Generator. These are "off the shelf" components like Google Maps. In fact, the "napkin" art schematic makes it clear that the Google engineers assembled components like digital LEGO blocks.

The "secret sauce," however, is that this invention becomes another building block. Other Google engineers can use the "Transportation Routing" invention to enhance other services. Google's homogeneous infrastructure – remarkable consistent when it is compared to Amazon's or Yahoo!'s infrastructure – and "snap in" code modules make it easy for Google to create new enterprise applications. Select, test, snap in. Select, test, snap in. After some fiddling, Google has a logistics capability combining the best features of Google Maps, routing intelligence, real-time data sensitivity, and flexible outputs.

Contrast this with the typical innovation cycle. Market research defines what engineers need to create. Code is written, debugged, and deployed. The sales force pushes the product to customers.

Google doesn't work this way. Its solutions can be assembled, tweaked, and deployed. If customers like NJ TRANSIT like what Google offers, Google can add functions and features by "snapping in" additional components.

The "Transportation Routing" invention provides a glimpse of the engineering approach that sets Google apart. No company's engineering is without flaws. But Google's approach reduces the likelihood of missteps and makes it cheaper and easier for Google to change features and functions quickly. Google's competitive weapon is its ability to

create functional modules that allow engineers to build applications quickly. Failure occurs, but the cost of that failure is low.

Google is a threat in logistics because an enterprise solution is a happy consequence of Google's pragmatic engineering practices. While other companies experience analysis paralysis, Google constantly surprises.

Stephen Arnold
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