



ZOOM OUT BREW 2008 CONFERENCE

Navigation Around the World – An Overview

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Agenda

- **TCS and Market Overview**
- Challenges and Opportunities
- Questions and Answers



TCS Fast Facts

- 20 year old company; publically traded (TSYS)
- Over \$130M in Revenue and 600+ employees
- Two main Business Lines
 - Commercial Software
 - Government Solutions
- Worldwide operator customers in location platform, messaging and applications
- Leader in E-9-1-1 and E-1-1-2 services for North America and EMEA

Commercial Software Overview

Location Infrastructure and Services	Location Middleware	Location Applications
<p><i>Software</i></p> <ul style="list-style-type: none"> • Xypoint Location Platform • Xypoint Roaming Gateway • Xypoint Reference Network <p><i>Services</i></p> <ul style="list-style-type: none"> • e911 wireless • e911 VoIP 	<p><i>Software</i></p> <ul style="list-style-type: none"> • Xypoint Mapping Server • Xypoint Dynamic Data Server • Xypoint Content Module • Messaging Server • Web Messaging Gateway 	<p><i>Mobile</i></p> <ul style="list-style-type: none"> • Navigation • Traffic • Maps & Directions • Local <p><i>Web</i></p> <ul style="list-style-type: none"> • Traffic • Maps and Directions



Location Value Chain

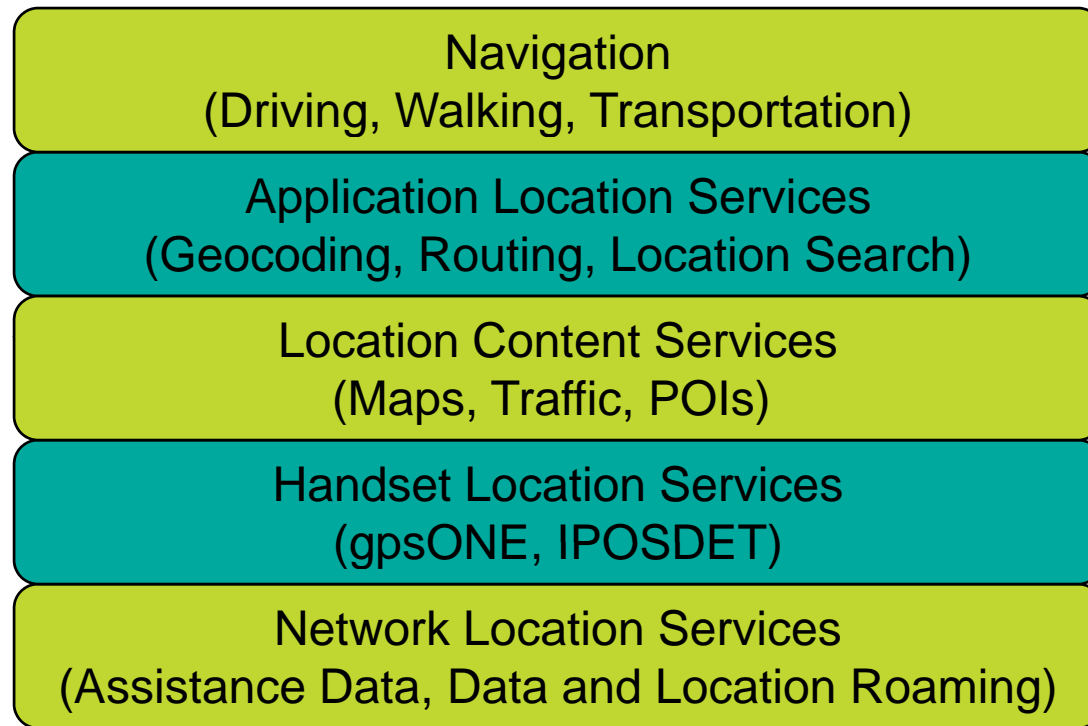


Why Navigation?

- Navigation dominates United States' Mobile Application Market
 - 51% of application revenue are LBS applications
 - 80% of LBS applications revenue is Navigation
 - » Telephia, a Neilson Co., October 2007
- Worldwide GPS Handset growth to increase from 140+ million in 2007 to over 600 million in 2012
 - » ABI Research July 2007

Navigation is the Key Revenue Generating LBS
Application!

Navigation Ecosystem



Navigation is what the customer experiences, but
Quality of Service is dependent on the entire
ecosystem



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Challenges: Network Location Services

- Ensuring consistent customer experiences while they roam across networks
 - Data roaming charges for LBS Applications and LBS roaming support
 - European data roaming provides impediment to LBS services
 - Lack of LBS roaming means users locked into single network
- Ensuring Good Application Behavior for network LBS requests
 - Managing how MS-Assisted requests are made by the Applications
 - Getting initial fix via MS-Assisted and then dropping into MS-Based



Challenges: Handset Location Services

- Ensuring consistent user experience between handsets
 - GPS acquisition still varies by handset; especially indoors
 - Antenna positioning critical for reducing time-to-fix
 - Going into fallback faster
- Providing global coverage for GPS services
 - More handsets enabled and faster
 - Increase number of commercial LBS enabled handsets



Challenges: Location Content Services

- Ensuring global content coverage
 - From map to traffic to points-of-interest data providing effective coverage worldwide to support navigation
 - Road and address coverage in geographies outside of North America and Europe
 - More points of interests to make local search meaningful
- Provide rich content with local relevance
 - Integrating local dining, events and public transportation information
 - Local rich content from local sources (newspapers, TV)
 - Train, bus and bike routes for multi-mode navigation



Challenges: Application Location Services

- Ensuring availability of critical content to customers
 - Effectively integrating Traffic, Rich Content and Public Transportation
 - Alternate routes based on current traffic conditions
 - Routes based on Public Transportation
- Consistently finding customer entered destinations
 - Finding an address where it does not exist or there are multiple exact matches
 - Street number is not in map data
 - Ambiguous geocoding results



Challenges: Navigation Services

- Providing local feel to application experience
 - Address entry and geocoding critical features
 - Colonias for Mexico City
 - Local Street Types and Names (Calle and Roosevelt)
 - Ambiguous geocoding support for multiple results
- Effectively integrating rich content and multi-modes
 - Unique content views (ratings, reviews) coupled with unique map views for driving, walking, and using public transportation
 - Different map views for driving and walking
 - Incorporating user generated content

Navigation Opportunity

- Partner to fill in the gaps
 - LBS Roaming
 - Local Content
 - Road Data Coverage
- Service the Rest of World
 - Europe and United States and Canada have been focus
 - ROW wants navigation too!
- Create compelling customer experiences
 - Make it local and relevant
 - Address entry made easy
 - One size does not fit all

Navigation
(Driving, Walking, Transportation)

Application Location Services
(Geocoding, Routing, Location Search)

Location Content Services
(Maps, Traffic, POIs)

Handset Location Services
(gpsONE, IPOSDT)

Network Location Services
(Assistance Data, Data/Location Roaming)



Opportunity: Partnering

- LBS Roaming – work with carriers and network enablers
 - TCS, nTelos and Sprint partnered to provide LBS roaming
 - Alltel and Sprint partnered for LBS Roaming
 - Qualcomm leading standards approach to LBS roaming
- Local Content – work with the local operators
 - Operators often have access to yellowpages information
 - Operator content managers know which companies are good sources
- Road Data – work with the map data providers and local resources
 - TCS partners with both map data providers to improve road information
 - TCS works with local providers to “go local”



Opportunity: Rest of World

- United States and Europe – First Wave
 - Operators deploying navigation and pace is accelerating
 - Verizon, Alltel, nTelos
 - Europe is being driven by smartphones
- Latin America
 - Operators interested but Location Content challenges abound
 - Map coverage and local content
 - Vivo is very active in LBS and creating regional interest
 - Great example of how it can work and be successful
- Asia Pacific, including China and India
 - Japan and Korea leaders in LBS services
 - Longtime commitment to LBS
 - China and India are critical growth areas showing increased activity
 - More activity in India



Opportunity: Compelling Experience

- Go Local
 - Keep it fresh and personalized
 - Update content frequently and provide integration with customer's preferred content sources
 - Go beyond the travel guides; look to newspapers and weekly guides
 - Local "Best of" listings and alternative sources
- Get there quickly
 - Understand customer behavior for address look-up and entry
 - How do they do it locally?
 - Enable the customer to pick from a map if no exact address matches are returned
- Customize application for customers
 - Provide ability to change application flow for different modes
 - Walking versus Public Transportation versus Vehicle
 - Make it simple to use and personalize
 - Navigate quickly; customers subscribe to their local content



Summary

- Navigation is still early (even in the United States)
- We are at the beginning of the first wave of deployments and customer adoption
- Ecosystem challenges provide ample opportunity for solutions

Partner to Succeed!

Create the Solution!

Deliver a Quality Experience!