

QUANTUM INVENTIONS

---mobility intelligence---

A company of Continental corporation

CORPORATE PROFILE

www.quantuminventions.com

Quantum Inventions (QI), headquartered in Singapore, holds more than 10 years of experience in providing a suite of solutions in Intelligent Transport Systems (ITS) that constantly sets the standards in technology, efficiency and innovation.

QI provides mobility intelligence to consumers, automotive corporations, enterprise and government customers, leveraging on its integrated suite of mobility applications, connected navigation, enterprise logistics and analytics platforms.

A spin-off company from the Centre for High Performance Embedded Systems (CHiPES) at the Nanyang Technological University (NTU) in Singapore, QI is a pioneer in dynamic navigation technologies. QI's strength lies in its ability to transform cutting-edge technologies into innovative products and solutions that are cost-effective.

QI owns intellectual property and techniques including hardware portable efficient dynamic routing, map-matching and map database partitioning. Leveraging on its technologies, QI provides next generation dynamic navigation systems that are highly responsive to real-time information such as traffic data, road incident information, dynamic road pricing, etc.

Quantum Inventions takes a strategic view to technology development and is active in national and international standardization activities, ITS architecture developments and ITS industry forums. Quantum Inventions is continuously seeks for value added international partners to globalize the next generations solutions and services test-bedded in Singapore.



OUR SOLUTIONS

Innovative Solutions To Build Intelligent Transportation Systems



With our comprehensive and integrated suite of solutions, we deliver exactly what your business needs to stay ahead. In our rapidly changing world, it's time to take the leap with Quantum Inventions.

Leveraging on our knowledge base and a breadth of products in traffic, navigation and routing technologies, QI provides mobility intelligence services for:



**CONSUMER
APPLICATIONS**



**ENTERPRISE
APPLICATIONS**



**GOVERNMENT
APPLICATIONS**

CONSUMER APPLICATIONS

Connected navigation bridges the gap between traditional navigation software and the needs of urban users with a universal, seamless experience across their car and personal computing devices, delivering user inspired connected services that not just satisfy, but also augment their modern lifestyle, entertainment and social needs.



Turn-by-turn connected navigation system with live traffic information

Galactio Mobile is the first GPS mobile navigation application that provides motorists with live traffic information. Using localized and updated maps, Galactio is the only intelligent navigation system in Singapore that offers users traffic-aware routing, live traffic cameras, updates on realtime traffic incidents and ERP gantries thereby helping drivers to save time and money.

Available in Singapore, Malaysia, Thailand, Indonesia and Philippines.



Live Traffic Info & Traffic Avoidance Routing



Real-time ERP Rates & ERP Avoidance



Live Traffic Cameras to view Current Traffic Conditions



Feature Rich & Interactive Maps



Alert for Speed Cameras & Red Light Cameras



Warnings for Bus Lanes



Live Parking Info - Includes HDB Car Parks



Share Real-time Position & ETA with Contacts



Offline Maps

ENTERPRISE APPLICATIONS

In order to remain competitive in the market, an enterprise needs efficient logistics solutions as well as optimized asset utilization to achieve operational excellence. Addressing these needs requires threading the element of innovation into your business processes.

Automotive

Our Automotive solutions integrate with existing dealership and customer management systems of auto makers, giving them an opportunity to closely connect with and better understand unique drivers, and devise unique forms of customer engagement and retention.



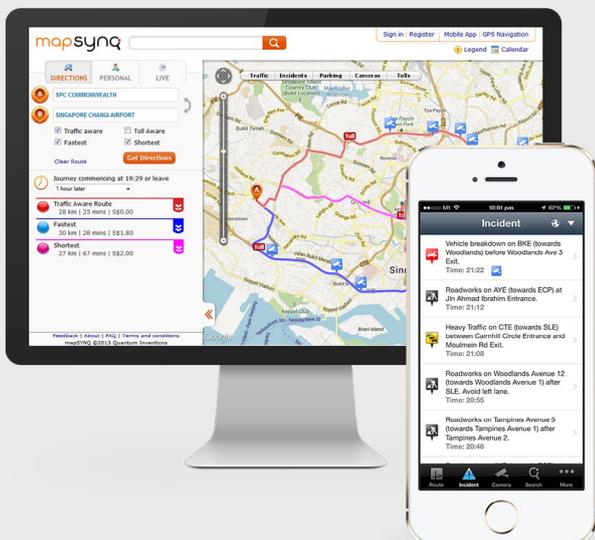


IN CAR - CONNECTED NAVIGATION

In-car navigation system to plan and optimize routes with real-time traffic information.

Available as in-dash units for OEM manufacturers, authorized dealers as well as personal navigation devices (PND) and aftermarket equipment.

- Easy integration with third party hardware
- Highly customizable solution
- Regular software and map updates
- Compatible with Windows CE and Android
- Available as a connected device



mapSYNQ - OEM

Personalized real-time traffic information platform for motorists and commuters.

mapSYNQ's brilliant technology provides a traffic aware routing and congestion management platform.

- Premium offerings including SOS feature
- Capability of a CRM system
- Flexibility for global deployment

mapSYNQ

Quantum Inventions is a leading provider of end-to-end telematics and navigation solutions to help you reduce cost and increase efficiency. Our integrated solutions and proprietary products allow track & trace capability, job dispatch operations, route optimization and more.

Logistics

The Quantum Inventions Telematics solution, which integrates dispatch and navigation, offers you a comprehensive technology that can best track & trace, monitor and analyse your fleets in real time.





READY TO DEPLOY MOBILITY TRACKER

Integrates the SLA OneMap, trackSYNQ offers in-depth GPS fleet tracking, smart surveillance and monitoring capabilities in real-time.



Accurate Maps



Access From Any Device



In-House Installation Team



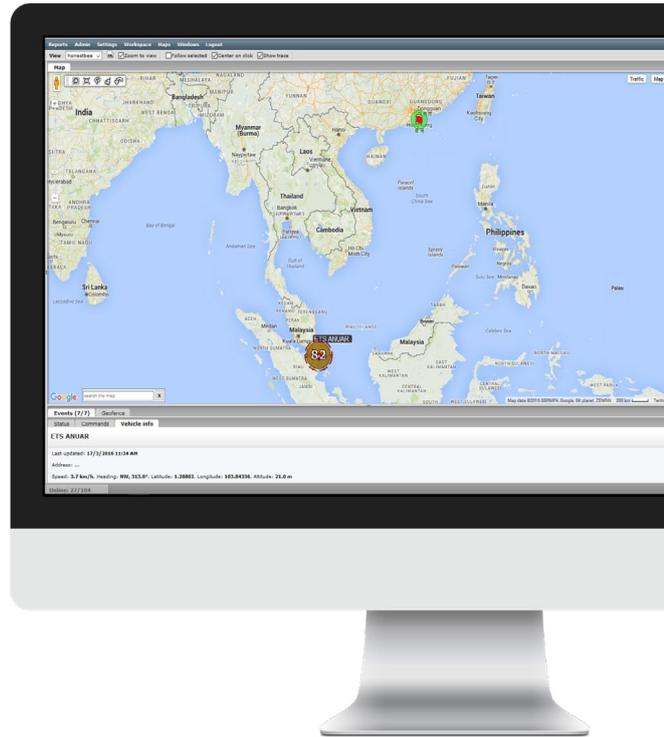
Real-Time Tracking



2nd Generation MVNO



Save \$\$



ENTERPRISE GRADE DISPATCH AND FLEET TELEMATICS SOLUTION WITH GPS NAVIGATION

TrackSYNQ PLUS is an advanced fleet management application to automate and transform business processes, helping you control costs and improve fleet efficiency.



Multiple Job Dispatch



Job Scheduling



Real-Time Dashboard



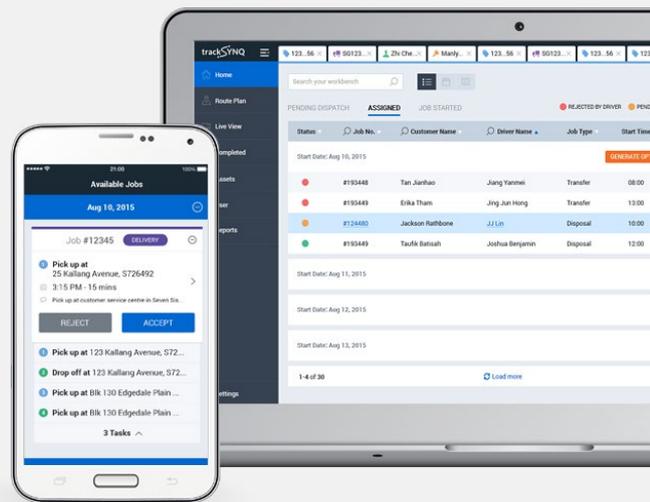
Agile System



Intelligent Reporting



Route Tracking

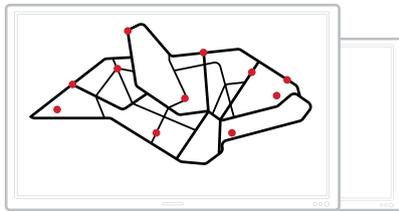


GOVERNMENT APPLICATIONS

Understanding your performance today, identifying your strengths and weaknesses and recognizing emerging needs is important when developing a plan for future investments. Our traffic intelligence data is highly robust and customizable that helps governments get agile, adaptable and efficient.

URBAN TRANSPORT SMART CITY PLATFORM

GOVERNMENT



CONSUMER



ENTERPRISE



DATA SENSORS

1 TRANSPORTATION

- Consumer Navigation
- Enterprise Fleets
- OD Matrix Clusters

2 TRAFFIC INFO

- Road Speeds
- Incident Data
- Toll Pricing

3 OTHER DATA

- Telco Mobility
- User Generated Data
- Events



Backed by superior data processing systems, enhanced data driven services and applications, the QI smart city platform serves as an engine to launch smart city initiatives. Our real-time analytic capabilities integrated with information dissemination over standard protocols such as API, XML etc. enable extraction of mobility patterns that can be applied to government applications for various use cases.



Traffic Prediction



Urban City Planning



Citizen Services



Crowd Metrics



TRAFFIC AND TRANSPORTATION ANALYTICS

QI offers a unified end-to-end mobility platform for smart cities that ranges from data collection and sourcing to publication of value-added services, client applications and analytical insights.



CORE TECHNOLOGIES

Powered by the accurate fusion of our speed, journalistic incident, historical and road pricing data, QI provides innovative solutions combining GIS, maps, dynamic navigation & routing, real-time data processing & analytics. Our customized projects are powered by:

Quantum Online Routing System (QORS)

State-of-the-art routing platform that provides dynamic routes based on multiple static and dynamic criteria.

Traveler Information Platform (TRIP)

Platform for creation, fusion and dissemination of traffic information obtained from different sources.

CASE STUDY 1

ASSA & MAYBANK BII Boost Operational Productivity by Leveraging Tracksynq for Dispatch

INDONESIA

ASSA

Established in 2003, ASSA (Adi Sarana Armada Tbk) is one of the largest transportation service companies in Indonesia.

MAYBANK BII

Maybank Indonesia is one of the largest banks in Indonesia, providing a comprehensive range of products and services to individual and corporate customers



OVERVIEW

Maybank BII's mobile workforce commissioned ASSA's on-demand limousine services for business travel.

BUSINESS CHALLENGE

ASSA with a large fleet of vehicles faced increasing operational challenges that include managing trip requests, lowering administrative cost and improving asset visibility. The operational IT intent of the customer included:

This resulted in the following problems:

- Automating handling of trip requests, job dispatch & driver allocation
- Implementing a mechanism to improving driver efficiency
- Deploying a system to automate recording of jobs done and data entry tasks

Lowering the number of man hours required for creating and maintaining job invoices

Maybank BII grappled with difficulties in handling trip requests from employees and managing supporting travel and expense documents. Hence, the business need for Maybank BII involved:

- Implementing an expense tracking system to determine employee spending on travel
- Applying mechanisms to ensure transportation service is used only for business purposes
- Installing a job management platform to automate trip requests
- Reducing the time spend on communication for driver's estimated time of arrival

OUR SOLUTION

Quantum Inventions developed a customized solution based on the trackSYNQ platform to meet both ASSA's and Maybank BII's unique business requirements.

The solution included the following key features:

- Single window to manage job dispatch, driver allocation and asset tracking
- In-built business logic software to assist dispatchers in job assignment decision making
- Standardized navigation software with live traffic information for efficient routing

- User friendly web portal to place bookings
Integration with a mobile app to allow collaboration amongst dispatchers, drivers and customers. The application helped dispatchers to notify key changes to the drivers and the customers to get status updates from the drivers.

- Intuitive reports to track daily operational activities, vehicle usage, asset allocation and idle times

RESULTS

Quantum Inventions provided ASSA and Maybank BII with an efficient, automated solution that minimized manual work and mitigated the risk involved in it.

The solution offered the following benefits:

- Minimization of manual effort and optimal asset utilization due to process automation
- Reduced turn-around time for logging in job requests to receiving request approvals
- Improved visibility into fleet operations with live vehicle tracking, idle time monitoring and regular metrics reports
- Increase in driver efficiency with intelligent job assignment and routing software
- Decrease in overall operational expenses with streamlined processes and reduction in overall trip length by 20%
- Better management of daily tasks and improved collaboration with the communication platform
- Greater control over employee spend and eliminated non business travel claims

CASE STUDY 2

QI Helps PSA Streamline Its In-Port Logistics Operations

SINGAPORE

PSA INTERNATIONAL

PSA International operates the world's largest transshipment hub at PSA Singapore, interconnecting 600 ports and several shipping lines to every major port in the world on a basis.



BUSINESS CHALLENGE

PSA needed a services partner that understood not only how to implement an automation platform but also the complexities of distribution and logistics. The key challenges that PSA faced included understanding how to:

This resulted in the following problems:

- Eliminate GPS inaccuracies to allow PSA to track the location of their assets
- Convert the existing location mechanism that displays GPS co-ordinates into land marks
- Enhance operation readiness and predict the arrival time of the prime movers accurately
- Improve operational efficiency and reduce wait time by establishing a co-ordination between the prime movers and the quay crane operators

OUR SOLUTION

Quantum Inventions addressed PSA's critical and complex requirement with a turnkey solution, based soundly around our core capabilities, yet, augmented and customized to conform to its operations. The engagement was conducted in three phases.

PHASE 1

Creating the missing piece in the puzzle: High Accuracy Geo-coded Digital Map

In this phase, Quantum Inventions developed a unique mapping solution, creating a precise and accurate digital map for the PSA terminals. The existing prime mover tracking system was upgraded by Quantum Inventions to incorporate a reverse geo-coding solution. The new solution allowed translation of the prime mover's GPS coordinates into comprehensible and operationally usable terminal land marks. The geo-coding solution along with precision mapping enabled PSA to track the location of their assets in real-time.

PHASE 2

Piecing it together: Online Routing Engine

With the mapping and tracking system defined, Quantum Inventions then progressed to build a solution to compute the Estimated Time of Arrival (ETA) of the prime mover from his current location and the distance to be covered by him to reach the destination. To do this, Quantum Inventions employed its QORS (QI Online Routing Engine) technology, which calculates the total driving time based on the request received. In addition, it allowed clear communication to the quay crane operators regarding arrival time of the prime movers.

PHASE 3

The complete picture: In-vehicle solution

To address PSA's business needs, a graphical user interface was incorporated to the existing system. The touch screen system eliminated paper based interactions, automating the job dispatch function, providing real-time tracking capabilities for vehicles and assets, in addition to presenting a visual display to the prime movers. The complete system enabled the drivers to receive new jobs, maintain a constant line of communication and know where to go for the job amongst other features.

RESULTS

PSA continues to drive benefits from the partnership, including:

- Reduced lag times in information from the prime movers to PSA, as a result of live feed, resulting in better coordination of related activities
- Greater control over the terminal operations and real-time visibility of assets, allowing proper planning
- Enhanced communication and co-ordination among PSA, prime movers and quay crane operators with an effective tracking and feedback system
- Improved staff productivity with high end automation of core business processes
- Increased return on investment with smoother end-to-end logistics flow and decrease in overheads
- Better management of daily tasks and improved collaboration with the communication platform
- Greater control over employee spend and eliminated non business travel claims

CASE STUDY 3

Comfort Taxis Upgrades Its Taxi Booking Process To Optimize Operations

SINGAPORE

COMFORT TAXIS

A market leader in Singapore, Comfort Taxis is one of the largest land transport companies in Singapore, belonging to ComfortDelGro Corporation Ltd with a global fleet of over 46,650 vehicles.



OVERVIEW

The incumbent taxi dispatch system employed by Comfort Taxis assign jobs to the nearest taxis based on straight line distance. Thus, the taxi assigned for each booking was the one with the shortest, direct, straight-line distance to the customer location.

BUSINESS CHALLENGE

The taxi assigned under the straight-line distance system did not account for actual routing distance, time taken, traffic conditions and other such conditional factors, hence was often not capable of reaching the customer in the shortest time possible.

This resulted in the following problems:

- Imprecise job assignment since the taxis with a shorter driving distance get passed over as they appear to be further away
- Customer no-shows due to late arrivals of taxis or availability of alternative transport

OUR SOLUTION

Quantum Inventions provided a routing engine for the dispatch system, whereby the dispatch of taxis is determined by routing distance. Quantum Inventions's Online Routing System (QORS-AE) helps to identify the nearest taxis based on driving distance rather than just based on the straight line distance. QORS-AE provides a simple HTTP-based Enterprise Server for high performance routing from multiple taxis to the pick-up point and returns a list of taxis, sorted from nearest to furthest to aid the dispatch system.

The Quantum Inventions solution provided:

- **Routing Engine For Taxi Booking and Dispatch System**
Through this system, the jobs are assigned to the nearest taxis based on total time of travel and actual routing distance. Thus, the taxi would reach the customer in the shortest time, resulting in increased customer satisfaction.
- **Full-Featured Turn-By-Turn Navigation**
Quantum Inventions's navigation software, Galactio was integrated with the MDT software using APIs to provide routes, show location maps and automatically start navigation based on the pick-up points and destination pushed to the MDT as part of the dispatch operation
- **Enhanced Driver Experience**
With Galactio, drivers had access to driver assistance alert features for speeding, approaching traffic cameras and speed cameras, and when driving on roads where bus lanes are in effect at that time.
- **Estimated Time of Arrival**
QORS-AE enabled calculation of the driving distance as well as estimated travel time.

RESULTS

Quantum Inventions provided Comfort Taxis with an efficient solution that resulted in:

- **Efficient Taxi Dispatch**
The Quantum Inventions dispatch system led to a reduction in customer waiting time.
- **Decrease in Travel Distance**
The navigation software helped to reduce the time taken as well as the distance travelled to reach the destination by accurate routes offered through the navigation software.
- **Increased Location Accuracy**
The maps in the navigation software also helped to improve the position reported to the servers, enhancing accuracy of the dispatch.
- **Improved Compliance To Traffic Regulations**
Driver assistance features such as speed warnings helped to keep drivers and passengers safe and ensured that the driver complies with the traffic regulations.

CUSTOMERS - NAVIGATION



CUSTOMERS - TELEMATICS



CUSTOMERS - GOVERNMENT & ENTERPRISE



PARTNERS



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