



MIT SCALE RESEARCH REPORT

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Research Report: ZLC-2006-5
An Information System Platform for Tracking Technologies in PLAZA
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An Information System Platform for Tracking Technologies in PLAZA

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EXECUTIVE SUMMARY

The emergence of Automatic-Identification (Auto-ID) technologies has enhanced the capability of tracking logistical flows throughout the supply chain. Companies are achieving numerous benefits through the implementation of Auto-ID tracking systems, including cost reduction, operating efficiency, and 100% traceability. Although there may be many forces pressuring companies to adopt these tracking systems, there are still many challenges to achieving a robust tracking system.

There are several factors driving the demand for tracking systems:

- **Legislation** – Industries such as the pharmaceutical and food and grocery have introduced strict mandates on the traceability of products throughout the supply chain.
- **Safety/Security** – A growing emphasis on global security measures and environmental concerns are pressuring transporters to assure reliable control of trucks and containers. Auto-ID tracking systems can provide a proven solution to securing cargo. Similarly, the tracking systems can allow for quick response to dangerous events such as spills and sensor alarms.
- **Customer Requirements** – As tracking systems continue to grow in popularity, customers around the globe will increasingly demand tracking solutions to maximize performance in their supply chain.

However obvious the factors for implementation of a tracking system may be, there are also several challenges:

- **Hardware/Middleware/Software Costs** – The costs of the physical elements in implementing an Auto-ID tracking system can appear to be very high. Such an investment will often times be unjustifiable, especially for small and medium sized businesses.
- **Implementation Knowledge** – The know-how of an Auto-ID tracking system can be difficult to obtain. Even when a company can invest in outsourcing the

An Information System Platform for Tracking Technologies in PLAZA

implementation of a system, there is still a need for internal knowledge which can be costly and promote risk.

- **Maintenance** – An elaborate system of state-of-the-art technology can be very expensive to maintain. This includes maintaining the servers, middleware, hardware, and software.

In an attempt to satisfy the demand for Auto-ID tracking systems while overcoming the challenges of implementation, we evaluated the potential of a platform information system. This centrally located platform integrates several state-of-the-art Auto-ID technologies across several companies under one system. The Auto-ID technologies that we will focus on will be Radio Frequency Identification (RFID), Bar Code, and GPS/GALILEO. A platform approach can answer the challenges of implementation by standardizing data, sharing costs, and centrally maintaining. The system will thus achieve economies of scale while enhancing collaboration. A platform system would be most appropriate when implemented across entities performing similar activities. For this reason, an ideal community to evaluate this platform system would be the Logistics Platform of Zaragoza (PLAZA). Therefore, we will base this model for the companies with logistics activities related to PLAZA.

Our recommended model describes the current technologies available. These technologies can be integrated into one system using data standards and messaging standards. There are data standards provided by EPCglobal, Inc., an organization established to create electronic identification standards. EPCglobal has also developed the EPC Network, which can be utilized to establish an integrated tracking system. The mark-up language XML can be used to provide the necessary messaging standards.

This model must have an information architecture that maps the physical flow of goods, to the middleware layer, and through the communication layer, to update the appropriate database in the information system. Necessary to a good model is a well organized database to capture information. The database can be accessed by users at the application level and achieve the numerous benefits available.

After the implementation of this model, the companies participating in the platform can enjoy many benefits including:

- Increased visibility and control
- Decreased operational costs
- Reduced administrative costs
- Enhanced collaborative commerce
- Improved system accuracy
- Optimized efficiency and responsiveness

An Information System Platform for Tracking Technologies in PLAZA

The results obtained in this research provide a firm framework for further research. The model described details the possibility of an information system that can serve many entities at an affordable cost. Further research can now be done to obtain specific implementation scenarios and detailed investment analysis.