

Moving Money

Every second billions of dollars circulate the globe electronically yet the cashless society exists only in the realms of science fiction. Cash remains an integral part of the global economy and countless businesses rely on its efficient distribution. The Zaragoza Logistics Center (ZLC) has teamed up with Prosegur, Spain's leading private security firm, to improve the logistics of moving hard cash.

Companies like Prosegur balance cash inflows and outflows for companies in many industries. They collect money from stores, banks, and gas stations, count and store it in high-security cash centers, and re-distribute it to banks and ATMs. If cash inflows and outflows in these centers are unbalanced, Prosegur either delivers excess money to or receives additional money from the central bank. Should such imbalances lead to empty ATMs, money shortages at banks, or the failure of collection services for stores' daily receipts, business is seriously disrupted. Moreover, high security requirements make these services much more challenging than regular collection and distribution processes.

Prosegur and ZLC have partnered to investigate the future of cash logistics. "In the first initiative we are working closely with the logistics experts at Prosegur to determine the future network design of high security cash centers," said Richard Pibernik, Professor of Supply Chain Management at ZLC, who is leading a team of researchers on the project.

The network must be able to handle increasingly complex flows of cash. As Pibernik explained, over the last couple of years the landscape in cash logistics has changed radically. Rapid economic growth, changing consumer behavior, and the increasing number of large retail stores and shopping malls have drastically changed both the volume of cash to be (re-) distributed and the sources and destinations of deliveries.

These developments require companies like Prosegur to rethink and redesign their cash logistics operations. ZLC's researchers have developed a software tool that quickly assesses future strategies for moving money, allowing for fluctuations in market volumes and shifting demand across the customer regions in Spain. Based on mathematical optimization techniques and Prosegur's operational data, the tool enables the cash logistics provider to identify and evaluate different operational scenarios. Using the tool, Prosegur's logistics experts and the researchers at ZLC have developed a roadmap for effective and efficient cash logistics operations, taking into account current customer demands and long-term projections of market developments.

Another research initiative will focus on the potential of new technologies such as Radio Frequency Identification (RFID), intelligent sensors, and location systems for improving the efficiency and security of cash logistics. "In a logistics system with the highest security requirements, Auto-ID technologies not only have a huge potential to significantly increase security, but can also help streamline operations and provide new measures for assessing the effectiveness and efficiency of these logistics activities," said Pibernik. For example, the automatic identification of the individual bags collected and delivered at banks and supermarkets will enable faster handling of money both in cash

logistics centers and at the clients' locations. Integration of Auto-ID technologies with fleet management and GPS/GSM-based location systems will increase visibility and security of cash logistics operations to the benefit of customers and security personnel.

The work is in line with current research trends and emerging industry needs. As a result of new regulations and increasing awareness of security and safety requirements, many companies are rethinking the design of cash supply chains. "The partnership between Prosegur and ZLC will provide cutting-edge concepts not only for cash logistics but for numerous other industries operating supply chains with specific security and safety requirements," said Pibernik.

Zaragoza Logistics Center is a research institute at the University of Zaragoza. The Center collaborates with the Massachusetts Institute of Technology through the MIT-Zaragoza International Logistics Program and acts as the coordinator of the Spanish Center of Excellence in Logistics. For more information contact Richard Pibernik (rpibernik@zlc.edu.es).