Creating Competitive Advantage - A Case Study
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The common adage that suggests that knowledge is power can be misleading. The accumulation of knowledge that is not applied rarely yields power nor does it create competitive advantage. Although the trucking industry has undergone a series of deregulation measures over the last two decades, the collection of data plays an essential role for not only establishing the basis for new safety regulations and but also for determining various Federal Motor Carrier minimum standards. This work examines the use of one Federal repository of data that is essential to the safety operations every freight carrier in the United States and Canada. A summary of the costs and benefits of the use of regulated data will be presented. Finally, an alternative for creating competitive advantage through database construction and management will be offered.

Federal Regulatory Compliance Mandate

A federal standard for commercial motor vehicles drivers did not exist before 1986. Prior to the enactment of the Commercial Driver’s License (CDL) Program in many states and the District of Columbia any one with a driver’s license could also own and operate a tractor-trailer (Federal Motor Carrier Safety Administration, 2008). The Commercial Motor Vehicle Safety Act of 1986 established requirements for commercial motor vehicle drivers, freight carriers and the individual States. The Commercial Driver’s License Information System (CDLIS), an outgrowth of the Commercial Motor Vehicle Safety Act of 1986, is a data clearinghouse established to facilitate the exchange of information regarding holders of commercial driver’s licenses between the states. Access to the CDLIS is limited to intra-state public agencies and select industry service providers.
The DAC Service was established to provide CDLIS access to carriers. DAC Services, currently USIS, provides exclusive access to the CDLIS to carriers and other interested parties. For a commercial truck driver, the DAC report can be likened to a consumer credit report. USIS compiles a comprehensive database of driver information including motor vehicle reports, work history, traffic convictions, worker’s compensation claims, credit investigations and social security number verifications. USIS provides fee-based subscriber access to driver DAC reports. Carrier groups access DAC reports to pre-screen potential drivers. The primary benefit to the end-user of a DAC report is to demonstrate compliance with State and Federal commercial driver requirements.

Cost of Non-Compliance

The USIS DAC databases contain over 5.9 million records accumulated from over 2,500 motor carriers (USIS, 2006). The cost of DAC report service is nominal when compared to the cost of non-compliance. For ABC Transport, the average cost of a DAC report is less than $100 per driver. A carrier that knowingly uses a driver with an invalid commercial driver’s license can be assessed a penalty of up to $10,000 per occurrence (FMCSA, 2008). Using a DAC report not only insures that a potential commercial motor vehicle driver has a valid license; information in the report can also be used as a predictive tool to identify potential licensure challenges that could be a precursor to driver disqualification.

Private Relational Databases

DAC Services assembles information from the CDLIS and various other sources including past driver employers. Best categorized as an operational database, the DAC databases are constantly updated with new information but do not provide any probability data. Comparatively, the databases maintained by Amazon.com are relational. DAC Services and
Amazon have both made significant capital investments in database management systems. Such investments should sustain the overall quality of data outputs and decrease in operational costs over time. Smaller organizations such as ABC Transport can adapt the database management strategies employed by both DAC Services and Amazon.

Internal Database Assembly Benefits

Document-based information flows through ABC Transport daily. With driver turnover ratios exceeding 110% annually, retention of qualified drivers is essential to successful operations. The transportation industry relies heavily on the information services generated by USIS’ DAC Services. While the fee-based service generates direct revenue for USIS, ABC Transport derives indirect economic benefit from the services that are purchased. To date, ABC has not made efforts to create any competitive advantage from the information received from the driver DAC Reports. The safety function of ABC Transport is a dormant repository of information that could generate competitive advantage for the organization. “Information technology also enables document-based information systems to become more widely distributed throughout [the] organization (Beaver, 2003).

For small carrier groups such as ABC Transport service differentiation can be a difficult mission objective to achieve. Often freight movement can be a homogenous process; information technology is essential for creating competitive advantage. Load dispatching and tracking are obvious aspects of operations that routinely receive information system development consideration. However, the safety function can also be leveraged to create added value. ABC currently employs document imaging technology in its freight billing process. If the currently available imaging technology were used to fortify the existing document-based safety information system, information could be indexed into a hybrid relational/object-driven database
management system. Bloor suggests the addition of object database constructs to the traditional relational database model provides the following advantages:

1. Faster transactional application processing
2. More effective handling of complex objects
3. Improved developer productivity
4. Easier management

(Bloor, 2003, 2004)

In theory, an object model would “expand the view of the data” (McNurlin, 2006); which is currently one dimensional at ABC. A full driver profile could be created using information from the DAC Report, driver application and other sources. Using imaging technology, this information could then be indexed and assembled into an object database. Individual objects consist of the following:

1. A piece of data
2. Methods, or procedures that can perform work on that data
3. Attributes describing the data
4. Relationships between this object and others

(McNurlin, 2006)

When paired with agent/terminal profiles, driver screening and retention processes can take on a more strategic role. As previously stated in this work, DAC Reports contain information regarding driver work history and geographic freight movement information, an object database could yield more effective driver/agent pairings; reducing turnover and improving overall customer service. Incorporating existing imaging technologies with the emerging database
models could yield tangible benefits to end-users. While the integration of object and relational database models remains theoretical, the advantages of a hybrid database could include:

1. Good transactional performance
2. Complex data management
3. Ease of management
4. Rapid development
5. Flexible query capability
6. Standard data access interface
7. Suitability for business intelligence applications

(Bloor, 2004)

Conclusion

The effective, efficient management of data should be an organizational priority. Incorporating information from proprietary databases with information internally assembled ABC Transport can create competitive advantage by improving the accuracy, relevance and integrity of its information systems. Migration away from a purely document-driven safety information system to a database management system will decrease data redundancy and increase data flexibility.
References


