IT IMPLEMENTATION AT CALIFORNIA DMV

In 1987, the California Department of Motor Vehicles undertook a major project whose goal was to update its 20-year-old system and merge the department’s enormous driver’s license and vehicle registration databases. With California being the “undisputed world capital of the information technology industry,” the public’s assumption presumably would have been that the project would sail through without major quandaries. The project was to cost $27 million and be up and running within 5 years. However, in 1993, six years after the project was begun, the DMV project was abandoned completely. The DMV had spent $44.3 million on a system that ultimately did not work.

HISTORY AND BACKGROUND

The California DMV was born in 1915 with Senator F.S. Birdsell’s "Vehicle Act of 1915." However, the first vehicle to be registered was done so in 1905, when the Secretary of State was empowered to register vehicles (at the time, there were an estimated 17,015 vehicles in the state). By the time of its inception in 1915, the number of vehicle registrations in the state of California had increased to an astonishing 191,000. However, these registrations took place on a one-time basis. In 1919, the permanent license plate law required that owners register their vehicles on a yearly basis, starting in 1920.

Now, with nearly 31 million registered drivers, 38 million cars, 50 million total records, and over 8 million new licenses issued each year, the California DMV is the largest vehicle information organization in the world. Being able to function in such an environment would not only be difficult, but would require an extremely efficient system. The objective of the project was to update their database in order to become more competent and proficient with their customer service, minimizing wait times. Furthermore, the new system was to help employees improve speed and organization by streamlining the business process. This, however, would prove to be an enormous challenge.

Tandem Computers, Inc.

The DMV project was to “convert the state’s 28-year-old DMV database from an IBM ES/9000 mainframe platform to 24 Tandem Computers Cyclone machines running the NonStop Cyclone SQL relational database.” The $5 million development contract account went to Tandem Computers, Inc. based on a $1 million benchmark test conducted by the state in 1988 between

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1 Gurwitt, Rob. “Overload”
2 http://www.dmv.ca.gov/about/profile/history.htm
3 Ibid
4 Ibid
6 Savage, J.A. “Tandem Wins Bid for State Vehicle Database”
7 Appleby, Chuck. “Agency’s Drive to Nowhere”
Tandem and IBM. In the fierce competition, Tandem’s 28-processor VLX with Nonstop SQL beat out IBM’s 3090 Model 400S mainframe and DB/2 relational database.8

The California DMV had seven performance tests for the two companies to execute. While Tandem passed six out of the seven tests, IBM passed only two. However, although the DMV requirements demanded at least 30 transactions per second, Tandem’s 70 transactions per second in the evaluation was nowhere near their boasted 208 transactions per second from their own benchmark tests. The DMV system also necessitated constant uptime, a database with 12 tables in sizes ranging from one million to more than 80 million rows each, an average of 11.3 SQL statements, and close to 80G bytes for the database.9 The estimated costs for this type of database was $23 million by IBM, but only $10 million by Tandem. According to the benchmark, “while IBM was found to ‘be superior’ in the number of third-party tools available for the DB2 environment and was judged better in training because DMV employees were already trained on IBM terminals, editors and utilities, Tandem ‘demonstrated a higher degree of performance, availability and operational ease of use.’”10 It appears that IBM did not put enough effort into doing their homework because it was not a big enough hardware sale but that Tandem, a $1.6 billion firm, used the opportunity to “bash the $60 billion behemoth.”11 Because of their lackadaisical approach and conceivable overconfidence, IBM was outperformed. However, IBM would later stage a comeback after getting copies of the benchmark tests and greatly improving their hardware system12, but it was too late. They would later regroup and again connect to the DMV in the future.

In addition, the DMV wanted to implement a credit card type license with a digitized signature and photo and a magnetic strip on the back that would store personal information about the driver. It was estimated that the total database project would cost about $10 million and serve 10,000 terminals in the headquarters along with their 170 field offices.13

In 1988, the California DMV signed consultants Ernst & Young to develop software applications for the database as well as serve as software consultants during the project. The contract was to be for $5 million, but software problems kept the project stalled. One year later, and after spending $3 million of the contracted $5 million, Ernst & Young abandoned the project (reportedly by mutual consent).14

NBS Imaging Systems

In 1991, the National Identification Systems, Inc. accused the California DMV of “gross incompetence, dereliction of financial responsibility and blatant disregard of state regulations and for committing to a fine-year $28 million contract for a new magnetized drivers’ license system that doesn’t work”15. The first part of the accusation referred to the DMV’s awarding a

8 Savage, J.A. “Tandem Wins Bid for State Vehicle Database”
9 Ibid
10 Ibid
11 Johnson, Maryfran. “Who You Gonna Call?”
12 Johnson, Maryfran. “IBM Reopens Benchmark Feud”
13 Savage, J.A. “Tandem Wins Bid for State Vehicle Database”
14 Appleby, Chuck. “Agency’s Drive to Nowhere”
15 PR Newswire Association, Inc. “California’s DMV Accused by National Identification Systems”
multi-million dollar contract to NBS Imaging Systems. NBS Imaging Systems were to revamp and operate the driver license division and identification card system but were ostensibly awarded the contract unfairly and illegally. National Identification Systems alleges that the DMV failed to follow its own state guidelines or the DMV’s own rules for the bidding process and that the Burlingame firm, Unisys and Polaroid were also in the running, but not awarded, the contract. Furthermore, because of this process, the auditor general filed a report condemning the actions of the DMV.

The DMV eventually charged NBS Imaging Systems a fine of $10,000 per day for noncompliance with the contract, as NBS could not deliver the proposed system as agreed upon in the contract. According to National Identification Systems, the DMV was later “seeking to purchase equipment from outside companies to verify the license data and to mail drivers licenses. The verification function was originally required of the successful bidder. Thus, the verification system will cost California taxpayers close to a quarter of a million dollars, and residents may still have to wait months to receive their licenses in the mail.” National Identification Systems saw this as trying to save face after blowing a big decision (as evidenced by the $10,000 daily fine), rather than just cutting their losses and moving on.

Ultimately, a California DMV spokesman said that the “agency had simply adopted untested relational database technology that could not handle the transaction demand from more than 40,000 users, with peaks of 30 transactions per second and 1 million per day.” In 1994, the legislative analyst’s office claimed that the public was aware of the disaster. He said that it was “generally known that there have been some real screw-ups.”

PROTECTIVE MEASURES

Office of Information Technology

Some groups, including Legislative Analyst’s Office, the State Auditor, and Wilson’s Task Force on Government Technology Policy and Procurement, feel that the California DMV fiasco maybe could have been avoided. Others feel that the DMV at least could have minimized the damage in the early stages of the project’s development. Part of the reason for this feeling comes from the responsibility of the State’s Office of Information Technology (OIT). For example, legislative analyst Elizabeth Hill feels that the DMV debacle could have been lessened if the Office of Information Technology had “taken a more aggressive role in overseeing computer projects.”

The OIT was created by the Legislature in 1983 to “plan, oversee, coordinate, improve and implement the state’s use of computers, and to approve computer-related expenditures to make

16 Ibid
17 Ibid
18 Ibid
19 Appleby, Chuck. “Agency’s Drive to Nowhere”
20 Green, Stephen and Vellinga, Mary Lynne. “State Hurt by Computer ‘Screw-ups’”
21 Gurwitt, Rob. “Overload”
22 Harrison, Sandy. “Bugs in State’s Computer System”
sure the money was spent wisely and government productivity was maximized.” 23 However, there was perhaps a range of problems connected to the relationship of the OIT and the California DMV. The State Auditor criticized the OIT for its lack of direction, leadership, and oversight of information technology management and stated that it “did not provide ‘sufficient guidance for the state’s decentralized information technology environment’ and gave only ‘limited assistance in designing and implementing information technology projects.’” Most damaging of all, it was woefully circumspect in exercising oversight of ongoing projects, allowing the DMV project, for instance, to continue long after it was apparent that it was plagued with serious difficulties.” 24 Furthermore, the legislative analyst’s report also blamed the OIT for the DMV catastrophe. While not completely forgiving the DMV itself, the report reasoned that most departments lack the qualified staff to make important, complex decisions regarding computer systems and that the OIT should have provided the leadership and support to stop the problems, but didn’t do so. 25 In general, there is a concern about the poor management and direction that the OIT is providing.

However, Stan Stancell, the Wilson administration chief deputy director of finance, offered a contrasting view. He stated that the technology office had never been expected to police all of the state computer projects and that they each department was expected to be forthright, honest, and responsible in reporting their activities. Because they couldn’t monitor them on a daily basis, they rely on them to act responsibly and in this case, the DMV didn’t. 26 It appears that no one is making sure that the state gets the best computer system for its money.

Submerged within the controversy created by the OIT, there were calls for a criminal investigation of two high-ranking state officials due to a possible conflict of interest. The most noteworthy was Steve Kolodney, the director of the OIT who oversaw the state’s IT concerns at the time the California DMV originally awarded Tandem Computers the computer hardware contract. In 1989 Kolodney took a leave of absence to work for Tandem as a consultant and then returned to his job as the head of the OIT one year later to again oversee the project. 27 Both Kolodney and Tandem Computers deny playing any role in Tandem’s winning the project and insist that Tandem won the contract based on the benchmarking tests mentioned above. Kolodney insists that he contacted the state’s Fair Political Practices Commission for its approval before working with Tandem and additionally maintains that the “California agencies conduct their own IT evaluation and development, including selection of vendors.” 28 Kolodney, however, refused to testify at the State Assembly’s committee.

**CONCERNS**

In 1993, the California DMV director, Frank Zolin, pulled the plug on the entire project when he found out that it would take another $100 million (beyond the $44 million already spent) and

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23 Ibid
24 Gurwitt, Rob. “Overload”
25 Harrison, Sandy. “Bugs in State’s Computer System”
26 Ibid
27 Appleby, Chuck. “Agency’s Drive to Nowhere”
28 Ibid
another four years to make the system work. This computer system disaster has helped to spark a wave of concern throughout state officials as well as citizens. This anxiety perhaps was aggravated, as other computer projects throughout the state were scrutinized and found to have similar results, with a combined worth of over $1.3 billion. The worst project was the Statewide Automated Welfare System, which was the largest computer project that the state had ever undertaken. As of 1995, the project was roughly five years behind schedule, nowhere near being done, and estimates were that the project could end up costing over $1 billion itself. Other state projects included the Department of Corrections, the state Board of Equalization, the Teale Data Center, the Franchise Tax Board, the Department of Housing and Community Development, the Department of Transportation, and the Secretary of State’s office imaging technology system. In all cases, the projects had run into technical problems that had caused them to run over budget and behind schedule.

The concern with these particular projects was that the state was not returning an optimal (and in many cases, not even a reasonably good) return on the state’s invested money. Likewise, the lack of statewide leadership, planning, and management was a cause of alarm for many tax payers across California and no one was implementing any blockades to immobilize the failures. This instigated an anxiety that rippled across California in reference to both current projects as well as other potential future projects. They all appeared to be spinning out of control and the public pressure was certainly on the legislators.

MODIFICATIONS

In a case such as this standard perception would indicate and call for “more control—stronger purchasing rules, additional layers of bureaucracy, more auditing. Unfortunately, this usually doesn’t work, and it often makes things worse, while it also squeezes out desperately needed innovation” and forms a “vicious cycle: Inappropriate controls lead to poor performance, which leads to more controls, and so on.” This is especially true with technology, where innovation is not only important, but rapidly changing so that an organization with an exceptionally slow bureaucratic process creates a slow procedure which leads to obtaining technology that can be outdated or inadequate. As a formal analyst put it, “What happens is you conceptualize what you want done, put it out to bid, and then find out five years later that you either have to pay a whole lot more money to get what you thought you were buying or the thing doesn’t work.” This especially does not work with non-commodity items where an organization cannot simply buy an off-the-shelf product, but must adapt it to their system. Moreover, this bureaucracy leads to departments taking on huge projects so that they only have to go through the bureaucratic process once, rather than starting small and adding on.

29 Appleby, Chuck. “Agency’s Drive to Nowhere”
30 Harrison, Sandy. “Bugs in State’s Computer System”
31 Gurwitt, Rob. “Overload”
32 Harrison, Sandy. “Bugs in State’s Computer System”
33 Ibid
34 Mechling, Jerry. “Reinventing Technology Procurement”
35 Gurwitt, Rob. “Overload”
36 Ibid
Since the DMV misfortune, several legislators now pay close attention to information technology issues. However, legislators, in general, may not be competent enough to deal with major technology issues. They have made positive strides, however, in appointing skilled people to do so. First of all, they created a new Assembly Select Committee on High Technology to educate members about the difficulties involved in developing large projects. Furthermore, and more importantly, they have replaced the OIT with a chief information officer (CIO) and given that person authority over IT projects (including the ability to halt them). The CIO reports directly to the governor. The one drawback may be that, as of yet, they have not given the CIO political power, which could be necessary if he faces fierce pressure from several directions. The new CIO of California’s DMV, Leo Verheul, thinks that this position can prevent fiascos such as the last one from reoccurring. In fact, he said, “I’m here to make sure that $50 million debacle doesn’t happen again. Don’t get me wrong, [the DMV] didn’t have a CIO at the time. If it did, that probably wouldn’t have happened. I would have never agreed to it - ever. There were too many unproven and unknowns.”

The Electronic DMV

One other program that the California DMV has since implemented to be more user-friendly is their online registration program, dubbed “DMV of the future.” The cost of this new program is about $2 million, but the state is only investing $400,000, with the balance to be made up by IBM (interestingly enough) in an effort to form “a strong partnership with the state of California.” The smaller investment not only lowers the risk for the DMV, but also presumably lessens the concern for a potential failure on the part of the DMV. Part of this investment will be a support system to handle questions for online users.

The online registration program does appear to have several drawbacks. First of all, the user must be re-registering the vehicle. It does not work for newly purchased vehicles because of the added paperwork and processes involved. Furthermore, the user must be insured through one of three insurance companies that are participating with the DMV (California State Automobile Association Northern California, CSAA Southern California, or Mercury Casualty). Even with these restrictions, however, the eligible vehicles account for about 4.5 million cars or trucks each year, and could also include an additional 3 million boats or trailers (which don’t need insurance), for a total of 7.5 million vehicles. The user can simply pay the fees with a credit card online (using a PIN number that the user receives after applying for it) and their registration would be instantly recorded. This greatly reduces the amount of paperwork as well as queued wait times for the customer and seems to be extremely efficient. The objectives for the new technological program include:

37 Ibid
38 Ibid
41 Fagin, Kevin. “DMV to Offer Online Car Registration”
42 Ibid
43 Ibid
- Simplifying business transactions for front-line workers, giving them streamlined access to all appropriate information and processes.
- Being flexible and expandable.
- Providing secure and user-friendly communication, both between employees and with customers, business partners and contractors.
- Offering single-point-of-contact accessibility and use a universal client identifier.
- Facilitating efficient workflow and reduce paper generation.
- Giving DMV customers 24-hour access to key services.

The online DMV program has turned out to be a fantastic success. In addition to re-registering their vehicles online, state residents are now able to register to vote, petition the DMV for certain simple refunds, make appointments, personalize their license plates, and pay traffic tickets all over the Internet. Furthermore, they are able to access the driver’s license handbooks, state laws, and the vehicle codebook, as well as their own driving records and other services and information, all on the DMV website. Included in these services is a option to go through the process in Spanish, helping to serve their ethnically diverse population and targeting a wider range of customers. This saves time and money for the customer as well as the department employees, making it much more convenient for everyone involved in the driving process.

**ALTERNATIVE SUGGESTIONS AND IMPLEMENTATION**

Obviously, the California DMV had grossly underestimated the size of this project and consequently failed to recognize its scope. In addition, they did not thoroughly comprehend the technology that they had purchased as it may have become too big. In general, the DMV’s computer modernization project may have become too complex in its planning and implementation for a governmental department to handle alone. Therefore, they could not be very flexible in modifying the technology in order to fit their specific needs. As a result, they let the technology drive the change rather than allowing the business process to define the technology change and then adapting that technology towards their business objectives. Perhaps they were trying to create a system based on a reality that did not exist in trying to change the organization with the advances in technology.

The risk involved in a project such as this one is not immeasurable, but is certainly enormous. If risk is calculated as the probability of a certain event happening times the cost of that event taking place, then the risk of a project with flaws throughout (in hindsight) can be suggested as more than considerable. The DMV case illustrates taking a risk of substantial cost when the probability of failure only increases as communication breaks down, management becomes less directed and involved, and corruption flourishes. Furthermore, as the complexity of the project increases, the probability for failure increases. In the end, Frank Zolin felt that the risk had become too extensive to continue with the project, when another $100 million and 4 years would be required to finish and implement it. Because the cost, probability for failure, complexity, and risk of the project had increased again, the project was abandoned.

While the change in the legislature (creation of a CIO) is a step in the right direction towards correcting the problems, the DMV can also make changes that do not involve the legislature.
Clearly, it is difficult to operate in a bureaucracy, but the DMV simply must be more informed in terms of what is needed and what is expected in such projects. The communication between vendors and buyers in this situation must improve significantly. The communication breakdown in this area was a detriment and a liability to the project. Furthermore, before committing to a project of this scope, they should consider all possible solutions and then follow the process that is set up for bidding and selecting potential vendors to contract. Competition should help the DMV in making a decision of this magnitude and find the best solution.

The DMV should also focus on their business objectives when taking on such a project. It’s possible that they lost this focus throughout the life of the registration project. They were able to maintain their focus on their online registration project, and it has turned out to be a great success. For example, if their focus is on reducing wait times for customers, they might consider implementing a change in their queuing process, such as generating numbers so that the customer can sit and read while waiting to be called, rather than standing in line and thereby reducing the perceived wait time. Having a clearly stated direction on their projects seems to be a formula for success.

Focusing on their business objectives may have been a weakness of the management team on the project. Not only did the DMV suffer from poor direction from the OIT, but also inconsistent management direction from their own department. Because IT is not their core competency, the management should not have undertaken a project with such an enormous scope without proper consulting and constant communication to experts in the field and industry such as the OIT or private consultants (or in future cases, the CIO). The project’s complexity may have been somewhat overwhelming to the decision makers. In the end, it was this lack of direction that caused the mistakes and misdirection of the project. The four C’s of planning and IS strategy (communication, coordination, control, and competence) were not used very effectively in this example.

The DMV computer modernization project was not necessarily a disruptive technology, but can possibly be viewed as one in the sense that there were not concrete models to follow for implementing such a technology and furthermore, the risk involved was similar to that of a disruptive technology. Without having a model to duplicate, the DMV’s infrastructure needed to provide the necessary framework on which to build. This was difficult to do with such an outdated system. Additionally, managing disruptive technologies requires strong product leadership, operational excellence, and effectively managing resource allocation. However, once their infrastructure was established, they could move on to other similar disruptive technologies, such as the online program, which turned out to be a highly successful business process endeavor.

Implementing these changes would certainly be a challenge, but nevertheless, it should have been possible. The DMV has conclusively demonstrated that they can achieve certain objectives, as evidenced in their online program. The upper management of the DMV needs to work more closely with their IT department in developing these changes so that the business objectives coincide with the IT objectives. In other words, they need to work towards accomplishing a two-way strategic alignment and thus, the transformation will be more complete and will consequently achieve the overall company goals. In addition, the management team
should have looked for qualified consultants who could counsel them on making proper business decisions regarding the design and implementation of the project’s hardware and software, thus smoothing out the edges of each stage within the project development. The entire project will then be linked to the business strategies.
References


http://www.dmv.ca.gov/about/profile/history.htm.
