Coursework 2011 -2012: 2910319, Decision Support and Executive Information Systems

Assignment 1

The following case study entitled,

"Business rules drive modernization of legacy transaction systems at the California Department of Motor Vehicles"

is concerned with the updating of the transaction processing computer system at the California Department of Motor Vehicles.

You are required to read the article below, written by the Fair Isaac Staff and answer the following questions.

1. What is the purpose of the California DMV system?
2. What is a business rule?
3. Is the enterprise decision management software part of a data-driven Decision Support System? Why or why not?
4. What is Enterprise Decision Management?
5. What decision support technologies were used?
6. What is a "legacy" system?
7. What is the major benefit of using Blaze Advisor and why?
8. What problems or difficulties do you anticipate with the use of this type of decision management solution?

Do not exceed 3000 words.

Fair Isaac decision management engine at the center of automating hundreds of thousands of transactions per day

by Fair Isaac Staff

The California Department of Motor Vehicles (DMV) is responsible for collecting approximately $4.1 billion annually in vehicle registration fees. Centralized computer systems in Sacramento communicate with local systems across 167 field offices throughout the state to handle the complex task of calculating registration fees for the nation's largest population of new and used autos, trucks, motorcycles, vessels and other vehicle types.

In 2000, the DMV realized that they needed to update and converge the two separate vehicle fee systems, and move to a modern system that would meet the state's strategic realignment towards eGovernment with future public access via the internet. The DMV began the Vehicle Registration Fee Computation (VR Fee Comp) project to consolidate and streamline the fee generation processes that were implemented across two different computing platforms, two computing languages and two distinct systems:

- The DMV Automated fee system (DMVA) is deployed on servers at each of the DMV's 167 field offices and its headquarters. It processes customer initiated vehicle registration transactions in real time in IBM's proprietary Event Driven Language (EDL).
- The DMV Batch fee (DMVB) systems are deployed on mainframe computers at the Teale Data Center, where the renewal notices are generated and the Remittance Processing system handles most of the "DMV by mail" processing in Common Business Oriented Language (COBOL).

Because of the two different computing platforms, changes and updates required two separate development efforts, two different analyst teams, and two different databases. This made it difficult to coordinate changes and ensure consistency between the two systems.

"Most of the computer programs composing the DMV legacy fee systems have been used for more than three decades with constant updates and workarounds grafted into the code by multiple people over the years," says Jerrianne Seitz, Data Processing Manager at the California DMV. "Making changes to the system was no easy task as one change could introduce numerous side effects."

Due to the complexity of the programs and duplication of effort required to make changes to two separate systems, the DMV was challenged to meet legislatively mandated deadlines for fee changes. Even minor changes required extensive analysis and programming efforts by the legacy system's development staff. There also was a real and practical need to update the systems as they had met their physical limitation; the DMV reached a point where they couldn't add more statements to the system.

"I'm not a programmer, and I wasn't familiar at all with rules-based processing. But it's been very easy to work with…much easier than conventional programming languages. I coded a fair number of the rules myself in Blaze Advisor and it only took our five-person team a little over a week to code all the rules."

—Jim McClean
DMV Senior Analyst

Solution

After discovering all of the places where Vehicle Fee calculation rules had been programmed, the VR Fee Comp team's analysis uncovered that instead of simply recoding the existing systems, they needed to look at newer technologies and methodologies for managing their business processes.

The team recognized that Business Rules Management Software (BRMS) would enable the separation of business logic, policies and processes from the actual application programming. The ability to give the power of business policies and business changes to analysts instead of programmers was a monumental change to the current application development process for the DMV, as often a limited amount of programming resources resulted in latency to system updates. In addition to faster system changes, a business rules system could enforce the greatest levels of compliance with the legislative mandates.

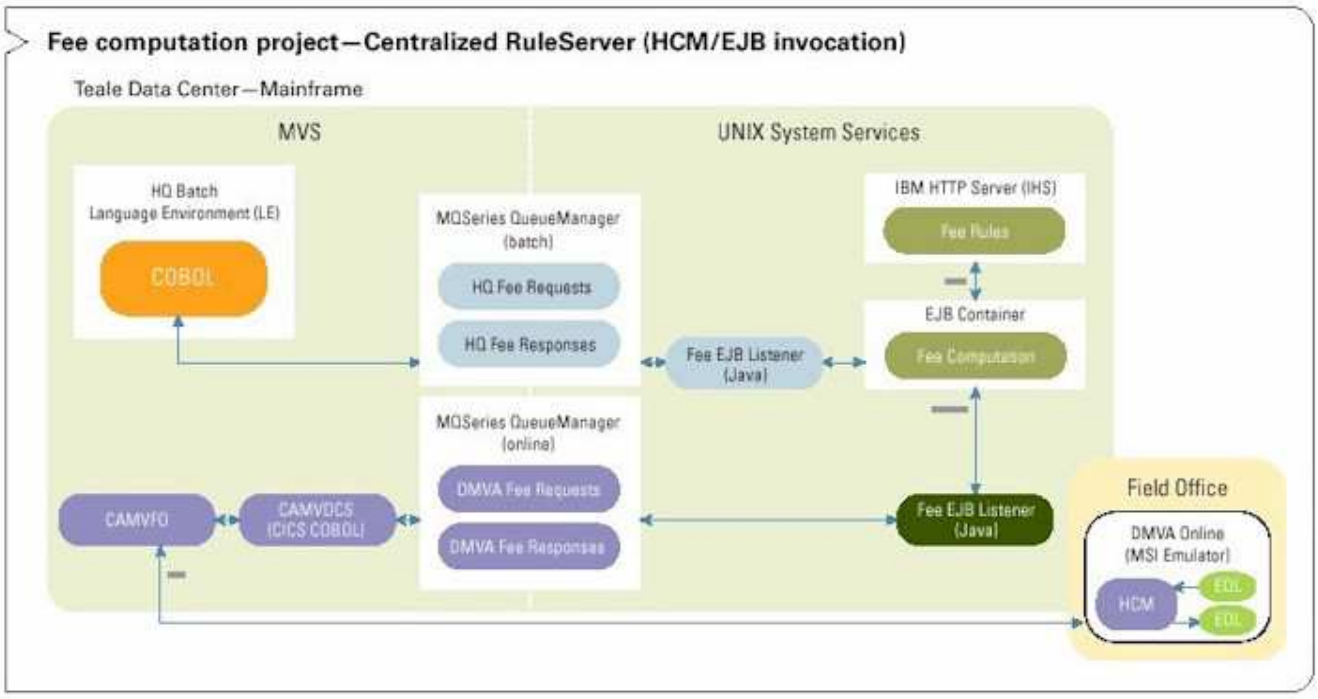
With a keen sense for developing a solution that would easily integrate with future technology and assure the solution's life-cycle longevity, the VR Fee Comp team was at the forefront of evaluating newer technologies, such as Java, and Java applications servers that would allow for an open and internet-ready system to facilitate future goals of web enabling components of the vehicle registration process.

Any BRMS would have to be understandable and usable by non-technical analysts responsible for overseeing legislative compliance. It would also require an intuitive user interface that would allow comprehensive control and testing of rules without obscure programming syntax. From a technical standpoint, it must run quickly and scale to handle massive numbers of transactions on a variety of computer systems, from the largest mainframes to office servers. And it would have to do all this without requiring replacement or rewriting of the vast majority of the legacy applications and systems in place throughout the DMV infrastructure. According to Seitz, "Many people within the organization felt our rules were so complex that a third-party software package wouldn't be able to handle the task. We needed to evaluate and demonstrate functionality and performance in any solution we planned to bring in."

The DMV blazed new trails by seeking innovative technology to create a new solution. Upon delving into the project, however, the DMV realized the necessity existed to also conduct a best practice review of their business policies and practice methodologies. The resulting clearer understanding of their decision infrastructure proved to be an invaluable process. They examined a business rules methodology, created a blueprint of their business processes, and looked at normalizing and understanding the terms and policies that were already in place. It was necessary to look at the existing business policies, the legislation that affects them, and how a consolidation of look-ups and interrelations could be architected to simplify future updates.

The DMV's Vehicle Registration team reengineered a vehicle registration fee system that could work in conjunction with both systems in a manner that would be transparent to the end user. The revised solution resulted in a Fair Isaac Blaze Advisor business rules engine, IBM WebSphere application server, and a Java 2 Enterprise Edition (J2EE) solution operating on a mainframe computer. The development team, however, faced the challenge of having little or no experience in Java software development. Most of the team was experienced with COBOL and Assembler programming. Fair Isaac Professional Services offered Java software training and on-site assistance during the pre-project implementation phase. The DMV was able to move smoothly from design and structure of conceptual rules to development and execution without fear of overlooking or misinterpreting key decision factors.

Leveraging the power of a centralized rules server built with Blaze Advisor and its rule maintenance applications, the DMV successfully gives the non-technical analysts who are responsible for overseeing legislative compliance the ability to ensure proper implementation of the policy rules across the DMV vehicle registration fee systems without having to become programmers. They also defined "templates" for certain types of rules that business analysts should be able to create on their own. These maintenance facilities are available through automatically generated web pages that eliminate formal rule syntax and custom editing environments.



With Fair Isaac Blaze Advisor, the business rules that DMV business analysts develop, test and modify can be executed on any platform in multiple locations. The result is vehicle registration fee calculations that are consistent statewide.

Results

The DMV has successfully developed a revolutionary solution that boasts a Fair Isaac Blaze Advisor business rules system as the cornerstone of its vehicle registration fee systems.

The first phase of the project implemented the new technical environment and fee business rules for vessels (i.e. boats and other watercraft). Vessels were selected for the first implementation because it represented a lower volume transaction count and therefore a lower impact to DMV field office operations. This phase was completed and successfully released to production in March 2003.

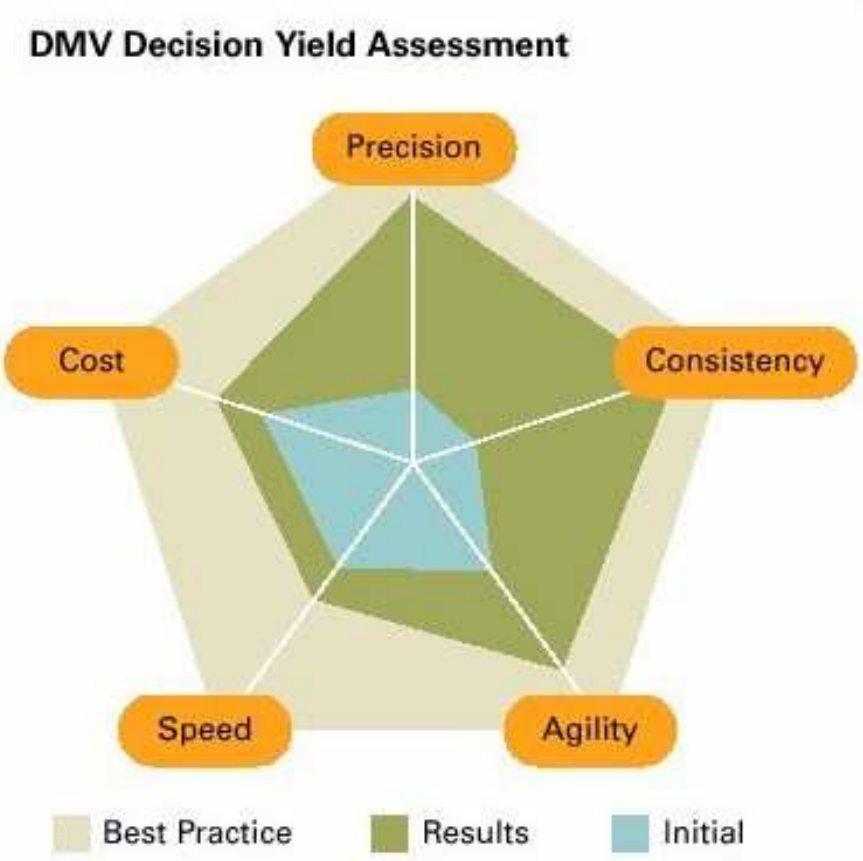
The second phase of the project implemented the new fee business rules supporting expedited legislation for the Vehicle Registration Penalty (Reg penalty) fees which could not be implemented in the legacy fee system due to its limitations. This phase went live across the DMVA in April 2003. The Reg penalty fees system processes 60,000 to 75,000 business transactions per day.

The third phase of the VR Fee Comp project went into production in February 2005. Phase three implemented the rules and fees for autos, commercial vehicles, trailers, motorcycles and off-highway vehicles. It required over 2,000 rules and numerous rule-sets, rule flows, and tables and processes for several hundred thousand business transactions per day. While many projects boast tens of thousands of rules, the DMV team's thorough methodology resulted in an effective rule-set of 2,100. With an efficient use of intermediate rules, the DMV proudly reduced the overall rule-set that results in less coding. It also provides better visibility into the rules that are in effect, an understanding of the levels of business change and how changes to the rules will interact and affect subsequent business processes. The DMV's new system leverages business rules to support mandated and changing legislative laws.

Thus far the fee comp team has focused on updating the DMVA aspect of the project. With the deployment of the fourth phase of the project to production the team moved towards the consolidation

of DMVA and DMVB. The DMV's new system leverages business rules to support the mandated and changing legislative laws.

Coupled with IBM's WebSphere Applications Server, Blaze Advisor positions the DMV to make future system enhancements more easily and to add centralized and consistent rules to delivery channels such as self-service websites and telephone response systems. "The implementation of the VR Fee Calculator on the Internet further supports our strategic business and IT goals by improving the integrity and quality of its products and services to customers," added Seitz. "The new rules powered system and resulting business practices should continue to lower our operating costs by decreasing the number of telephone calls and transactions in the CA DMV Field Offices and Telephone Service Centers." The system went live on June 30, 2005 as the main feature on their webpage and is a huge success. Now citizens can go see how much it would cost to register a vehicle or boat in California before purchasing it and will be able to see how much their registration fees will be in future years. To see the application run live, visit https://mv.dmv.ca.gov/FeeCalculatorWeb/index.jsp.



Benefits of the Fair Isaac Enterprise Decision Management solution

Agility: Moving to meet legislatively mandated deadlines for fee changes for the state can be made rapidly. Adding to the overall flexibility to the system, local taxes and ordinances that increase vehicle registrations can be easily made. For example, the DMV has made changes to add an additional "air-quality improvement tax" to citizens who reside in a specific county of California. Even more specific than the county, the tax is only applied to certain zip-codes within the county. With added agility and flexibility, these types of changes are now all possible.

Precision: When a new policy or legislation is implemented, the DMV is sure that the system will precisely calculate the fees correctly as the business analysts make the changes. In addition, the new system has the business logic separated so that the DMV is easily able to look at how changes to the system will affect the calculations. This is particularly important when demonstrating that the registration fees are calculated in a routine and consistent manner.

Speed: Routine changes to the systems as well as major updates to registration criteria and fee structures can be made much faster.

Cost: Updates to the systems today are much more cost effective. Moreover, migrating to a California citizens "self-service" architecture for new delivery channels, such as self-service web sites and telephone response systems, will be more cost effective in the future.

Diane Mobley, DMV Business Organization Project Leader, noted "With Blaze Advisor, our maintenance screens are very simple to use—you just pick what you want to change and alter it. Blaze Advisor even lets us put in effective dates for when to deploy new or modified rules. We have always had rules, but they have been in written laws, procedure manuals and application code. Before, we would give our information systems group a concept and they would go off to analyze, design and code it. Sometimes we got what we wanted and sometimes it was not quite clear. Now we can go in and make changes ourselves. It was the software that made it possible."

According to Jerrianne Seitz, Data Processing and DMV Project Manager, "What is very significant is that we were able to integrate Blaze Advisor with our legacy systems and technologies. Replacing full systems is high risk, time-consuming and technically difficult. In this project we were able to isolate our highest ROI component and renovate it with the best value."

About Fair Isaac

Fair Isaac (NYSE:FIC) "makes decisions smarter". The company's solutions and technologies for Enterprise Decision Management give businesses the power to automate more processes, and apply more intelligence to every customer interaction. Through increasing the precision, consistency and agility of their decisions, Fair Isaac clients worldwide increase sales, build customer value, cut fraud losses, manage credit risk, reduce operational costs, meet changing compliance demands and enter new markets more profitably. Founded in 1956, Fair Isaac powers hundreds of billions of decisions per year in financial services, insurance, telecommunications, retail, consumer branded goods, healthcare and the public sector. Fair Isaac also helps millions of individuals manage their credit health through the www.myfico.com website. Headquartered in Minneapolis, Minnesota, Fair Isaac reported revenues of U.S. $706.2 million for fiscal 2004. The company currently employs over 3,000 people in 10 countries.

Originally an operations research consulting firm, Fair Isaac pioneered the use of credit scoring for risk management. Credit scoring is an application of predictive modeling, the study of historical data to make forecasts about future performance. Initially, credit scoring was used to help lenders make better decisions about which credit applicants to accept. Using computers and proprietary algorithms to analyze thousands or millions of pieces of information on past customers' behavior, Fair Isaac could develop a "scorecard" that would identify the credit risk of any new applicant based on a few key pieces of data. For commentary related to Enterprise Decision Management check the edmblog at www.edmblog.com.

Please cite as:

Fair Isaac Staff, "Business rules drive modernization of legacy transaction systems at the California Department of Motor Vehicles", September 8, 2006, at URL DSSResources.COM.

Scott Olsen, Fair Isaac, provided permission to publish this case study at DSSResources.COM on July 17, 2006. Olsen's email address is ScottOlsen@fairisaac.com. Prepared in 2005 by Fair Isaac Corporation. This case study was posted at DSSResources.COM on Friday, September 8, 2006.

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DIPLOMA AND BSc IN COMPUTING AND RELATED SUBJECTS
FOR INTERNATIONAL PROGRAMMES STUDENTS

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Full name: .....
(as it appears on your Registration Form)

Student number: .....

Unit title: .....

Unit number: .....

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DECLARATION

I declare that:

- I understand what is meant by plagiarism.
- I understand the implications of plagiarism.
- This assignment is all my own work and I have acknowledged any use of the published or unpublished works of other people.

Signature ..... Date .....

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- ❒ **signed** and **dated** the Declaration?
- ❒ put your name and student number on every page?
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- ❒ used more than one page? If so, have you securely stapled or tied the pages together?
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- ❒ labelled clearly and securely attached any disks?
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If you fail to do these things your coursework may not be accepted.

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Stewart House
University of London
32 Russell Square
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Tel: +44 (0)20 7862 8326
Fax: +44 (0)20 7862 8329

Assignment 2

The National Health Service (NHS) in the United Kingdom is publically owned and financed by the government through taxation. All health care is free at the point of delivery.

The NHS embarked several years ago on a massive computer development programme to centralise all patient records throughout the United Kingdom and make them available to any authorised parties such as hospitals and general practicioners (GP's).

The UK Government has now decided to abandon the project since it has failed to meet its objectives and up to the present time has cost over £12 billion, which is way in excess of the original budget. It is likely to go down as one of the greatest computer failures of all time.

You are required to write a report on why this system failed, with particular analysis of the decision-making that led to such a disaster. You must do your own research, but you will find many articles on the internet dealing with this topic. Use whatever sources of information that you can find but insure that they are properly referenced.

Do not exceed 2500 words.

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Unit number: .....

Assignment number: .....

DECLARATION

I declare that:

- I understand what is meant by plagiarism.
- I understand the implications of plagiarism.
- This assignment is all my own work and I have acknowledged any use of the published or unpublished works of other people.

Signature ..... Date .....

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