**Drexel University**

**College of Computing & Informatics**

**SE 627**

**Requirements Engineering and Management**

**Operational Concept Document**

**Credit Reporting System**

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## **1. Scope**

### **1.1 Identification**

The Credit Reporting Software is a new system to be developed and implemented. This Operational Concept Document provides a synopsis on the operational capabilities of the new credit reporting system that will improve on the old system.

### **1.2 Document Overview**

This document is for all individuals and organizations intending to participate in investing, developing, and using the Credit Reporting Software. Participation is considered across all phases of the life cycle from acquisition of the software system, support, and retirement of the overall system. This document provides the details of what is expected from the software in the different business environments.

### **1.3 System Overview**

As credit reports play a significant role in the lives of American customers. Most decisions related to the approval of loans such as student loans, credit card, mortgage loans, and auto loans are totally based on the information contained in the credit reports of the customers. There are several other areas where the credit reports play an important role such as house renting and insurance. Since credit reporting has such a vast area of applications and plays a significant role for decision making for lending loans. It is important to have an accurate credit reporting system which is robust and has more real time reporting . This document discusses the operational improvement for a Credit reporting system from the existing manual credit reporting.

## **2. Referenced Documents**

* *Systems and methods for providing a customizable credit report. Patricia Cheryl Lassen, Karthikeyan Reddy, Aaravabhoomi. Date: Dec 03, 2012*
* *Personal credit management and monitoring system and method. John Owen, Emily Deere, James Weinberg. Date: Dec 20, 2004*
* *Method to electronically track personal credit information. Brian Siegel. Date: June 7, 2000*

## **3. Current System or Situation**

## **3.1 Background, Objectives, and Scope**

Current credit reporting systems are limited to a quarterly cycle for new updates to the credit score whenever a consumer makes a transaction or payment. Companies use credit reports and credit scores from the manually reported information in credit reporting files to assess a consumer’s likelihood of repaying the loan. Also, the current credit reporting system has insufficient storage of data and cybersecurity risks, which makes it easily susceptible to data breaches. Also the present credit reporting system is inaccurate reporting often, making individuals seem more risky than they are. The credit reporting data is updated every 90 day cycle in the current reporting system.

### **3.2 Operational Policies and Constraints**

Current Operational policies of the system are driven by two factors: Maintenance time factor and Time lag factor. Maintenance time of the system is the major contributor during the operation of mailing credit reports. Time lag factor of reporting the credit data of consumers creates another constraints on operations

**Time Lags:** The differences in the data records can occur in updating current records due to time lags between a consumer transaction and its reporting to a credit bureau file which is a major operational constraint based on extra effort and time given to diagnose inaccuracy and redundancy in the data recorded.

**Maintenance:** Maintenance adds additional operational constraint. The maintenance takes 10 days and the system is not accessible during maintenance and the whole process delays the mailing of credit reports which affects the decision making of the consumers/lenders.

### **3.3 Description of the Current System or Situation**

The current credit reporting involves the manual handling of credit reports which updates once a month and includes markets such as credit cards, auto loans, mortgages, and student loans, lenders use credit reports as part of their evaluation of a consumer’s application for credit. The reporting only accepts incoming data from certain organizations and is restricted to the only paper-based-mail deliveries on request basis. Due to security concerns credit reports are not accessible through the internet.

The current reporting data is updated every 90 days in the database with lots of redundant entries which reduces the performance due to insufficient storage and takes days to create and update customer information due to outdated database design. The database is not capable of detecting customers who no longer exist. Also, third-party collection items, reported by debt buyers or collections agencies on behalf of a creditor, are not considered a separate category on a credit report. The current credit reporting system has insufficient storage of data and cybersecurity risks, which makes it easily susceptible to data breaches.

The following are the types of inaccuracies that appear in credit files and the reports, each of these types of credit report errors may affect how a creditor or a credit score assesses the creditworthiness of a consumer.:

* Inclusion of accounts or records in a credit file that do not belong to the consumer, commonly called a mixed file: Credit reports can contain trade lines or public records about a consumer other than the one who is the subject of the credit report.
* Omission of accounts or records belonging to the consumer: A credit account or public record that belongs to the consumer’s file can be erroneously placed in another consumer’s file, leading to a mixed file, as described above. Alternatively, credit bureau matching algorithms or gaps in data can lead to a consumer trade line being kept separate from the rest of the consumer’s file.

### **3.4 Modes of Operation for the Current System or Situation**

The credit reporting system operates in 3 modes, Reporting cycle, Maintenance mode and output process, Each of these modes are critical and plays a significant role in the credit card reporting system because credit reporting needs to be accurate, secure and updated.

**Reporting cycle -** Once a quarter, the credit reporting system will gather data regarding any made payments or missed payments as well as new information about the capacity of any credit lines.

**Maintenance mode** - Create new customer information and update existing customer information based on received data. This process will take 10 days and happens each quarter and the system is not accessible during this mode.

**Output process** - Right after the maintenance, the system is able to produce the latest report based on customer’s requirement. The reports will be sent to the printing department, and then printed, packaged and mailed by the mailing department.

### **3.5 User Classes and Other Involved Personnel**

The major user classes of the credit reporting system: Consumer, Creditor/Lender, and Credit Bureau. These user classes play a significant role in the successful operation of the credit reporting system.

1. **Consumer:** Consumers are a key part of the system, their credit and loan accounts are reported to the bureau.
2. **Creditors:** Creditors are the ones who request data from the bureaus about consumers, when deciding what rates to offer to consumers based on their credit reports.

* Lenders (including those that offer credit cards, home, pay day, personal, title, auto including auto leasing, student loans, and security deposit financing and lease guarantee on home rentals)
* Employers, volunteer organizations, and government agencies to determine eligibility for government assistance (employment screening)
* Landlords and residential real estate management companies (tenant screening)
* Banks, credit unions, payment processors and retail stores that accept personal checks (check screening)
* Companies that market and sell products and services specifically to lower-income consumers and subprime credit applicants, such as short-term lending and rent-to-own businesses among others
* Insurance companies (health, life, property insurance screening)
* Communications and utility companies (e.g., mobile phone, pay T V, electric, gas, water)
* Retail stores for product return fraud and abuse screening as well as retail stores that offer financing such as appliance and rent-to-own businesses, among othersGaming casinos that extend credit to consumers and/or accept personal check

1. **Credit Bureau:** Credit Bureaus are responsible for collecting records and distributing information about the credit habits of the consumer.

* Information about consumer payment history as submitted by credit card companies, home and auto lenders (and leasing companies), and other creditors.
* How much credit consumers have and use.
* Information from debt collectors including unpaid medical debt that is greater than 180days delinquent from date of service, and past-due debt from cable and phone bills.
* Some public information like bankruptcies.
* Inquiries from creditors who have requested consumer credit reports when consumers apply for credit.

### **3.6 Support Environment**

In the current system, there are several external useful supporting agencies involved: Mailing services like USPS and UPS, These mailing services handle the delivery of the credit reports from the bureau to the customers or lenders upon requests. Also, Current data is documented, handed off and typed into a computer system. There are supporting data management systems associated with the current credit reporting system which keeps the records of consumers, Lenders and some public data like bankruptcy.

## **4 Justicaton For and Nature of Changes**

As the current credit reporting system requires manual handling of credit reports which updates once in every 3 months, a new automated system is needed for credit reporting which gives real time credit records of the consumer when requested.

**4.1 Justification for Changes**

The current credit reporting is in need of an upgrade. The aspiration of real time and most updated credit reporting led to an automated system which handles credit records of the consumer.

Accuracy and consistency are most critical and significant factors of credit reports which posit major change in the system. Another change is to make the credit reports free of data breaches Security of personal credit data of consumers is also supreme responsibility of the system

Finally, Delivery of credits reports via mail to customers delays their ability to make decisions which is unsatisfactory for both consumers and lenders. Credit reports should be available instantly when requested is an aspiration for both the creditor and consumer.

### **4.2 Description of Desired Changes**

There are three major desired changes, first is the ability of the system to give most updated and real time credit reporting data, second is the system should be secure of any data breaches have the accurate and consistent data and the third change is to avail the credit report data of consumers instantly which will help them in making quick decisions.

### **4.3 Priorities Among Changes**

For the three major changes, the highest priority is to make consumer credit reports data secure, accurate and consistent, next is providing instant credit reports to the consumer and lenders for quick credit decision making and lastly the ability to have a quicker credit reporting cycle for real time data.

### **4.4 Changes Considered but Not Included**

No additional changes were considered.

### **4.5 Assumptions and Constraints**

There are no current assumptions or constraints

## **5 Concepts for the Proposed System**

The Credit Report Software will perform a quicker report cycle, a better security measure and the latest database technology. The quicker report cycle will be once a day, in order to meet the growing business needs. The better security measure allows users to access the report through external internet in order to eliminate the cost of materials and mailing. The latest database technology allows administrators to delete the invalid information in the database, as well as reduce the maintenance and processing time in different modes.

### **5.1 Background, Objectives, and Scope**

The Credit Report Software is a software that manages consumer credit data for business companies such as banks, mortgages, insurances and employers. The current system has three main problems so it can no longer meet the growing business needs: update once a month, cannot accessed by external internet due to security concern, and unable to erase invalid information in the database. The proposed system’s goal is to fix these three problems in order to meet the business needs: the system will update customer data once a day, accessible through external internet and capable of eliminating out-of-date credit data.

### **5.2 Operational Policies and Constraints**

**Operational Policies** The following operational policies are expected to be followed for the Credit Report Software. These policies are not intended to limit the capability of the Credit Report Software but provide an overview of how the Credit Report Software will be used.

*OpPol 1*: The Credit Report Software will not release information to the public.

*OpPol 2*: The Credit Report Software will not accept connection or data transmission during maintenance.

*OpPol 3*: The Credit Report Software will not operate during power outage, earthquake or other irresistible conditions.

**Constraints** The following constraints are imposed on operations of the Credit Report Software:

*Constraint 1*: The maintenance time of the Credit Report Software will be no longer than 16 hours per month.

*Constraint 2*: The passwords of all accounts that are able to access the software and the database will be changed once a month, the new passwords cannot be the same.

### **5.3 Description of the Proposed System**

The Credit Report Software will perform customer credit management and report generation for clients. The Credit Report Software will accept credit data from fifteen authorized banks: JPMorgan Chase & Co., Bank of America Corp., Wells Fargo & Co., Citigroup Inc., U.S. Bancorp, Truist Bank, PNC Financial Services Group Inc., TD Group US Holdings LLC, Capital One Financial Corp., Bank of New York Mellon Corp., Goldman Sachs Group Inc., State Street Corp., HSBC, Fifth Third Bank, Citizens Financial Group. The Credit Report Software generates reports and implements security measures.

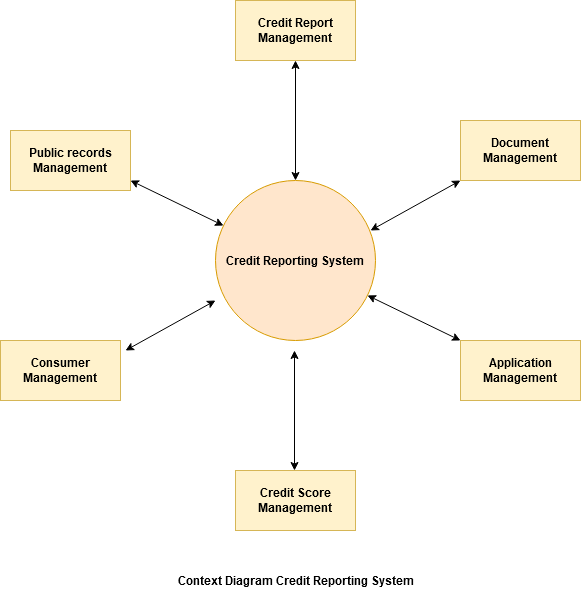
The Credit Report Software accepts credit data transmission from all authorized business partners. The transmission process can be any time, there is no time window limit except the monthly maintenance. The format of the data is Json, there is no size limitation for the customer data.

The report generation process starts at 6:00pm UTC everyday, the estimation complete time will be presented on the screen. The report format and size is customized based on the user's request. Any data received after 6:00pm UTC will be generated, updated or presented on the next day’s report.

All users and staff have a unique account to login to the system through the internet, they have access to review any customer’s credit report at anywhere, anytime. The password must be changed once a month, there will be a reminder to change the password when they login. The new password cannot be the same.

In maintenance mode, the system cuts off the network connection and starts the maintenance process. The maintenance process’s goal is to eliminate invalid information such as null or outdated data. Once the maintenance mode is over, the system reconnects to the internet connection. The planning of maintenance mode is decided, planned and published to the public by the administrator, the overall downtime is no longer than 16 hours per month. The Credit Report Software will restart after this process.

The Credit Report Software will use the same facility and hardwares. The major expense is buying licensed softwares, hiring and training development teams for software construction. The Credit Report Software should be built for less than 1 million dollars. This number is intended to be used to control development of the system and is not accounting for inflation.



### **5.4 Modes of Operation**

The Credit Report Software operates in 3 modes which are Accepting data, Generating report and Maintenance Mode.

**Accepting data** The Credit Report Software accepts all data transmission from authorized partners. Create new data entries in the database and update existing data.

**Generating report** The Credit Report Software generates customer reports. The format of each report is customized by user’s request.

**Maintenance Mode** In maintenance mode, The Credit Report Software cuts off internet connection. The Credit Report Software starts scanning and erasing invalid data in the database. The Credit Report Software restarts after.

### **5.5 User Classes and Other Involved Personnel**

1. **Consumer:**

Consumers are a key part of the system and main users that interact with the system, their credit and loan accounts are reported to the credit bureau where consumers credit history is generated and updated on the portal.

1. **Creditor:**

Creditors are the operators who request data from the bureaus about consumers when deciding what rates to offer to consumers based on their credit reports and after consumers approval they can have access to the Consumer’s credit history records.

Creditors can be further divided based on certain roles and business domains.

* Lenders (including those that offer credit cards, home, payday, personal, title, auto including auto leasing, student loans, and security deposit financing and lease guarantee on home rentals)
* Employers, volunteer organizations, and government agencies to determine eligibility for government assistance (employment screening)
* Landlords and residential real estate management companies (tenant screening)
* Banks, credit unions, payment processors, and retail stores that accept personal checks (check screening)
* Companies that market and sell products and services specifically to lower-income consumers and subprime credit applicants, such as short-term lending and rent-to-own businesses among others
* Insurance companies (health, life, property insurance screening)
* Communications and utility companies (e.g., mobile phone, pay TV, electric, gas, water)
* Retail stores for product return fraud and abuse screening as well as retail stores that offer financing such as appliance and rent-to-own businesses, among other gaming casinos that extend credit to consumers and/or accept personal check

1. **Credit Bureau:**

Credit Bureaus are also primary actors and play a significant role while interacting with the system. By using a Credit reporting system they are responsible for collecting records and distributing information about the credit habits of the consumer.

* Information about consumer payment history as submitted by credit card companies, home and auto lenders (and leasing companies), and other creditors.
* How much credit consumers have and use..
* Some public information like bankruptcies.
* Inquiries from creditors who have requested consumer credit reports when consumers apply for credit.

1. **Maintenance Personnel:**

Maintenance personnel keep track of the Credit reporting system and activities. They are responsible for editing, updating, and maintaining the system and make sure that the system is available 95.99% times. Maintenance personnels are responsible for the security of the credit reporting system and make sure that the system is not susceptible to data breaches.

1. **System Admin:**

Data managers are responsible for managing, storage, all the incoming and outgoing data and reporting real-time data of the users of the system, and make sure the data is consistent, accurate, and free from functional dependencies.

1. **Consumer Support:**

A Consumer support personnel is responsible for resolving **consumer** complaints via phone, email, or chatbox. Use telephones to reach out to **consumers** and verify account information. Greet **consumers** warmly and ascertain problem or reason for calling.Cancel or upgrade accounts

### **5.6 Support Environment**

The Credit Report Software requires a significant support environment. The support environment can be grouped into two areas: platform support and software support. The platform support is the running environment the software must operate on. The software support is the individual or team control and maintain the software during the operation and maintenance.

**Platform Support** The platform support is an abstract individual or team including maintaining the stability of the running environment, dealing with errors and finding out potential problems and security breaches, to provide an ideal running environment for The Credit Report Software.

**Software Support** The software support is an abstract individual or team including control and maintaining the running of the software including switching modes, inputting commands, checking status and restarting service.

## **6 Operational Scenarios**

**6.1 Scenario 1 - Customer Credit Data Transmission**

**Background** In this scenario, The Credit Report Software will perform receiving customer credit data from authorized companies.

**Preconditions**

* The Credit Report Software is running.
* The Credit Report Software has internet connection.

**Postconditions**

* The Credit Report Software is running.
* The Credit Report Software collects credit data from all sources.
* The Credit Report Software processes data in the following:
  + If the customer data does not exist, create new table entries.
  + If the customer data is existing, update the corresponding entries.

**Operational Flow** Initially, The Credit Report Software allows data flow input from authorized sources. The Credit Report Software starts processing all data immediately after the transmission. The Credit Report Software will create new customer data and update existing customer data.

**Off-Nominal Situations** There are some off-nominal situations to consider in this scenario including administrator stop the process and electricity outage.

The administrator can close the connection or stop the processing based on several reasons: cyber attacks, software failure, or other criteria.

Electricity outage can result in software offline, the received data will be stored but the system cannot receive new data.

**6.2 Scenario 2 - Report Generation**

**Background** In this scenario, The Credit Report Software will perform generating customized customer reports based on user’s requests.

**Preconditions**

* The Credit Report Software is running.
* Time is 6:00pm UTC.

**Postconditions**

* The Credit Report Software is running.
* The Credit Report Software has all customer reports.

**Operational Flow** Initially, The Credit Report Software collects all reports requests from users. The Credit Report Software starts processing data and generates all reports based on the customized options. The users are able to login using their accounts through the internet and look at the reports when this process is done.

**Off-Nominal Situations** There are some off-nominal situations to consider in this scenario including administrator stop the process and electricity outage.

The administrator can stop the processing based on several reasons: software failure, or other criteria.

Electricity outages can result in processing interruption, the processed reports will be saved, the remaining tasks will be resumed once the software is restarted and online.

**6.3 Scenario 3 - Maintenance Mode**

**Background** In this scenario, The Credit Report Software will perform cleaning invalid data in the database.

**Preconditions**

* The Credit Report Software is running.
* The Credit Report Software has closed internet connection.

**Postconditions**

* The Credit Report Software is running.
* The Credit Report Software has closed internet connection.
* The Credit Report Software has erased at least the following data:
  + Outdated data(Customer no longer exists)
  + Null data(Null value contained)
  + Empty data(Empty value contained)

**Operational Flow** Initially, The Credit Report Software closes all connections. The Credit Report Software starts scanning and erasing invalid data. For each month, the overall time of this process will not be longer than 16 hours.

**Off-Nominal Situations** There are some off-nominal situations to consider in this scenario including administrator stop the process and electricity outage.

The administrator can stop the processing based on several reasons: software failure, or other criteria.

Electricity outages can result in processing interruption, the process will be saved and will be resumed once the software is restarted.

**6.3 Scenario 4 - User Authorization**

**Background** In this scenario, The Credit Report Software will perform authorizing a user and accept the data transmission from the authorized user.

**Preconditions**

* The Credit Report Software is running.
* The Credit Report Software has internet connection.

**Postconditions**

* The Credit Report Software is running.
* The Credit Report Software has internet connection.
* The Credit Report Software has finished the authorization process.
* The Credit Report Software is accepting data from the authorized user.

**Operational Flow** Initially, The Credit Report Software detects data transmission requests through the internet. The Credit Report Software starts the authorization process by requesting username and password from the user. Once the information is found in the database and correct, the Credit Report Software allows the data transmission. If the user information is not found or wrong, the transmission process will not proceed, the user’s request will be rejected.

**Off-Nominal Situations** There are some off-nominal situations to consider in this scenario including administrator stop the process and electricity outage.

The administrator can stop the processing based on several reasons: human rejection, software failure, or other criteria.

Electricity outages can result in processing interruption, the process will be started at the beginning again.

## **7 Summary of Impacts**

There are multiple primary impacts to the new credit reporting system. The new system will now produce daily reports. The security in the new credit reporting system will be more robust and will decrease the likelihood of a cyber attack. The full and complete credit report will also be available to the user over the internet.

### **7.1 Operational Impacts**

The new credit reporting system can either be retrofitted into the current system or may require new hardware to operate. The new credit reporting system is expected to run on more platforms than just desktop computers. Users are expected to also use mobile apps to use the new credit system. Additionally, consumers can now download the credit reporting application on their iOS and Android platform. The new system requires consumers to create accounts and enter their full personal information. Since consumers are now using the new system, all their background information based on the social security number will be available to them once consumers have their account and can be able to access their credit reports instantly.

### **7.2 Organizational Impacts**

Currently the new system can be retrofitted to existing credit reporting systems to increase availability, performance and security.

The IT solution provider must exist to maintain and back up the software

### **7.3 Impacts During Development**

New hardware such as more servers, faster computers and a new online architecture. There may also be a need for additional maintenance personnel to keep up with the expected increased traffic demand.

## **8 Analysis of the Proposed System**

### **8.1 Benefits**

This new credit reporting system will reflect the modern e-commerce level of interaction. With the new credit reporting system. With the new reporting system, users will now see their credit reporting go up or down more frequently. This allows the user to react more swiftly to their new reports in a more productive manner and will produce favorable results.

### **8.2 Disadvantages and Limitations**

The roll-out of the new credit reporting system may be met with some industry challenges with upgrading old hardware to house the new credit reporting systems, educating the user they now have the ability to check new credit reports more often and to increase maintenance of the new credit reporting system.

### **8.3 Alternatives Considered**

The new system has several modes that alone can be a major upgrade if only one or a few can be implemented. The new system does not ask for much in terms of upgrading, but the scope of the new system can be reduced if necessary.

## **A Acronyms and Abbreviations**

Neither Acronyms or Abbreviations are used in this document.

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