



SAMPLE UNIVERSITY PROJECT DESCRIPTIONS

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MY REWARDS APP

Description

Customers get reward points for all credit and debit transactions (amount of “points” per dollar spent is user configurable), based on:

- Debit vs. credit
- Merchant category (standardized codes that describe the type of store – ex. supermarket, gas, ...)

Requirements

- Need to be able to store the rewards, in real-time, in a central location
- Need to be able for users to see their current reward total on the web or mobile device
- In addition to seeing rewards, users need to also see
 - Current balance (on credit card and bank accounts)
 - Available credit (on their credit card)
 - When their bill is due (and minimum payment)
- Location
 - Need to be able to identify stores that have special reward opportunities (ability to earn bonus rewards, ability to spend “instant rewards”) that are “close to the current user’s location”
 - User can configure
 - Only show stores that I have used before (based on my transaction history)
 - Do not show any stored (i.e. disable feature)
- Scalability
 - If it needs to work in real-time for 10 million customers, how is this different than just required for 1,000 users?

TRANSACTION PROCESSING IN THE CLOUD

Description

Build a high performing computing transaction processing environment using commodity cloud services (ex. Google). The solution needs to be highly available and highly scalable. Create a simulator to stress the created environment.

Requirements

System must support 4 transactions:

- Balance inquire: Given an account number, provide the current account balance (in dollars)
- Debit: deduct the specified amount from the account balance – account number and debit amount are specified
- Deposit: Add the specified amount to the account balance – account number and deposit amount are specified
- Inquire: provide a list of recent deposits and debits – account number and history range (days in the past) are specified

The test environment must include:

- Functional Testing: Web interface to perform functional testing
- Stress Testing: Multi-threaded (parallel) simulation to drive the system – tool must document maximum “transactions” (deposit, debit) per second.

Key challenges:

- Since it is running in a parallel environment, how does one ensure data consistency and transaction integrity?
- What are the design differences if the system needs to support 1,000 customers or 100,000,000 customers?

ENHANCED STUDENT RESUMES

Description

Create a web site that allows college students, when they apply for job (internships or full-time jobs after graduation), to show more information about themselves than is available on their resumes.

Requirements

Ability for users (students, employers) to create accounts

Information allowed to be stored for a student:

- Basic student profile (name, year of graduation, school, major, GPA)
- Student preferences (type of job, location of role)
- Student Resume (attachment, not requiring students to re-enter their information)
- Video presentation
- Posting some applications (web sites, mobile apps) created by the applicant
- 1-page statement of interest
- Recommendations from others (could be via linkedIn)
- Other information (perhaps suggested by the student teams)

Views available by employer(s):

- Sort students by on specified student attributes
- Ability to store information on a student (student rank/grade defined by employer, free form comments) and then retrieve that info (via search or looking at student)

Two configurations:

- Web site hosted/run by the university (so that many companies can use),
- Web site hosted/run by a company (allowing students from multiple universities to use the tool)

SPEND IT NOW OR LATER?

Description

Create easy to use financial planning software for people who just started working (and who often do not think about saving any amount of money, but where the power of compounding enables a small amount saved to grow a lot).

Requirements

Provide a service to answer:

- If I save \$X today, what will it be worth in Y years (users can change X and Y)
- Answer should be in future dollars, but with an option to see it normalized into today's dollars ("today's dollars" means to reduce the amount by inflation, so users can understand 'how much they can buy')
- Show a line graph of how the value will increase over time.

Should be able to run the app on a web site or a mobile device (iOS or Android)

Define default configurations that can be changed by the user, including:

- Rate of inflation
- Investment return
- Tax rate
- Potential enhancements:
 - Enable user to specify how money would be invested (i.e. percentage in stocks, bonds, money market) and then the system generates expected return (would over-ride expected return configuration)
 - Do Monte-Carlo simulation based on historical returns

QUIK TRANSFER

Description

Create a mobile application that allows for information/file/document stored on device A to be mirrored and/or delivered to device B securely. The key is that devices don't have to be the same OS nor manufacturer.

Requirements

- Need to be able to send data securely to another device.
 - NFC can be used but rules out Apple at present
 - Alternative cloud service should be created
 - User/Data repository
 - Rules for sharing/permissioning/tracking data
- Application created needs feature to search room/local area for another application seeking to bond.
- Data can be:
 - Mirrored to the device and then terminate at "sharer's" termination
 - Data can be sent to the device for storage
- All data at rest and in transit should be encrypted by a proprietary key
- Data requested to be kept on device will need to be confirmed that user has rights to hold that data and then make a record that the user has received data in repository
 - If validation cannot be done then mirrored option must take place.
 - If validation is successful but user does not have rights then data should be shown in mirror view
- All data shared or mirrored should be logged on "sharer's" application and uploaded to cloud as soon as available.

FINDMYWAY

Description

Create a tool for taking autocad files and rendering them in a digitized format that is acceptable by both Web and Mobile devices. The format should be plottable, leverage coordinates and be able to handle turn/turn directions (text based not voice). The core of the application is providing navigatable floor plans. Plan has three parts: Program to convert autocad files to a plottable tool, database/admin system to store/plot, and mobile app to navigate. #1 most important.

Requirements

- Current floor plans are in Autocad format (dwg, dxf) and need to be converted to a plottable/mobile format.
- Files will need to be stored in database and categorized by location/building (you can create the key).
- Floor plans should be readable on tablet and smart phones. Screen size should adjust.
- Web administration system will need to be in place so that after plans are converted users should be able to mark their desk
- Program should be able to plot a user on the map by looking up the user name and choosing to see where on the floor someone is located.
- If possible, turn by turn, using GPS should be leveraged to navigate a person to the person's desk.

LEVEL 3 DATA

Description

Level 3 data is the transaction (line item) level data found when you make a purchase. This data can shed light on specific purchase patterns of our customers – so not just that they buy from Wal-Mart once a week, but also exactly what they buy from Wal-Mart once a week.

Currently JPMC does not immediately capture this data right now, there are ways to get at the data (ex. Uploading of receipt, integration with POS, etc.). Each of the current solutions available have a distinct hurdle to overcome, for example, implement a new POS device or software can be expensive, and a merchant may be reluctant to change something that is already working fine. Implementing software into a mobile device which will allow customers to upload their receipts also has significant hurdles, as this requires work on customer's part.

Requirements

For this project we would like to focus on the business model of implementing one of these solutions. The two main questions we would like to answer are:

- What approach makes most sense?
- How do we convince a merchant/customer that this is good for them?

CODE FOR GOOD

Description

Code challenge web site. Site to find challenges, sign up, communicate during and storing code/samples/templates. Should be able to create a portfolio for the user/team and track them through multiple challenges. The code challenge website is only used during the timeframe of the challenge itself and the entire site is password blocked. Its primary purpose is to serve as a digital warehouse of information that can be easily accessed by all participants.

Requirements

Technology: This should be developed on Amazon EC2 in a LAMP environment on top of WordPress. Once this is completed, an AMI of the configuration should be created.

Components:

1. Home Page:
 - a) Top: Logo and Main Navigation
 - b) Body: Most Recent Posts
2. Main Navigation
 - a) Schedule: Broken down by day/time
 - b) Charities: One page for each charity with site links and challenge statements and logos
 - c) Technology:
 - i) EC2 Instance Overview
 - ii) Server Request Form
 - iii) EC2 Documentation
 - iv) Getting Help
 - d) Submissions:
 - i) Charity Preference: (includes deadline)
 - ii) Server Request Form
 - iii) Final Submission: (includes deadline)
 - (1) PPT/Presentation (upload or link)
 - (2) Overview of Solution (short description)
 - (3) Technologies Used (short description)
 - (4) Source Code (upload or link)
 - (5) Surveys (done via ConfirmIT)
 - (a) Forum: Integrated PHPbb with WordPress, self registration
 - (6) Nice to Have:
 - (a) Register on first visit and cookie user for rest of visits
 - (b) Link site registration with Forum
 - (c) Auto-fill forms on submissions

BUG TRACKING SYSTEM

Description

Rock Soft, a software development company, relied on shared lists and email to monitor the status of defects. This bug tracking system is error-prone and tends to cause those bugs judged least significant by developers to be dropped or ignored. So they need a very good Bug Tracking System which can maintain the bug history and stores all details from bug origin to bug resolution.

Bug Tracking System maintains bug history and stores all the details from bug origin to bug resolution. Bug Tracking System tracks all the information related to bugs/issues. While reporting a bug the testing engineer has to mention area (project, release), severity, priority, date/time, description (should contain steps to reproduce). Administrator should be able to configure Project, Release, and Bug status.

Project is generally associated with a manager. If the testing engineer has raised a bug selecting a project, an email should go out to the manager corresponding to that project and also the developers/engineers associated with the project and reporting to him. Manager assigns the bug to one of his teammates say ABC (now mail should be triggered only to go to ABC) and current owner of the bug should show as ABC. Once the bug is resolved the status should be updated with proper comments. This system also provides the searching based on status, priority, and operating system. It is provided with a fully authenticated system with password encryption. And has the facility for storing attachments for a bug.

Requirements

An ideal bug tracking system would allow users to track defects using the following operations:

1. Raise the defect
2. Assign the defect
3. Change status
4. Write comments
5. Search defects by defect ID

Technology

- Operating System: Windows / Linux
- Front End: HTML, CSS, JSP
- Middleware: Servlets / EJBs
- Database: My SQL / Oracle
- Development Tools: Eclipse / Netbeans
- Web Server: Tomcat / Glassfish

CONFERENCE MONITORING SYSTEM

Description

In almost all software companies, teams involve in the conference calls with their counter parts around the world. Conference calls are meant for clarifying doubts, understanding specifications, gathering requirements etc which constitute an important part of the project. Sometimes, members who are involved in the conference calls are unable to fully concentrate on the meeting due to various reasons, and miss out some important points that would well hamper the progress of their project. This is where this tool is intended to be handy, where in this tool would help to recognize the important points being discussed in the meeting, convert those points to text (Speech to Text converter), segregate those points according to their priority and importance and mail them to the members involved in the conference calls.

Requirements

Conference Monitoring System is a kind of tool that would track the conference calls, gather important points from the meeting, use the speech to text tool to document those points and thereby send those points to the members involved in the meeting, so that they can refer to the points that they have discussed in the meeting.

The Tool being developed should incorporate the following features:

- Ability to record voice over internet, using voice based protocols such as VOIP.
- Ability to convert the recorded speech to text using voice to text converter.
- Ability to segregate points from the text that has been converted.
- Prioritize the points manually and mail them to the members of the conference.

With the help of this tool, the teams involved in developing critical applications for the business would make the maximum out of the conference calls and hence would save time and increase their work efficiency

Technology

- Operating System: Microsoft Windows/Linux
- Development Tools: MS Visual Studio 2010/Mono .Net Framework
- Technology: WPF
- Database: Sql Server 2005/2008

Benefit

The project would make students to work with various complex network protocols and understand them to the depth. It would help them understand the tiered architecture of software tools, which would help them building complex industrial automated tools based on these lines. It would allow them to work with both high level and low level coding aspects and they would be working on establishing relations between these levels of coding which would fetch them far greater experience in dealing with complex applications.

ONLINE & ANDROID BANKING APP

Description

A banking and financial services organization wishes to provide round the clock service to its customers notwithstanding banking hours, public holidays, festive holidays or weekends. This would obviously be possible by providing a web based 24 x 7 software application that supports various customer / retail banking operations. Further, they would like to ensure that users can perform banking operations on the move i.e, use their cell phones for banking or, in other words mobile banking.

Requirements

This 24 x 7 banking application would allow customers to carry out core banking operations as listed below:

- Checking on various Accounts that a customer may have with the bank
 1. Account Balance
 2. Transaction History leading to statement of Account(s) – ask for electronic / physical copies.
- Funds transfer
 1. Within the bank from one account to another.
 2. From the bank to other banks / credit card accounts, facilitated by adding third party accounts as beneficiaries.
 3. Get status updates and / or track funds transfers.
- Inquire upon Loan Status / Repayment Schedules if applicable
- Get information on location of Bank branches and or ATMs
- Make updates to account information – adding / / updating / deleting names; change of address
- Requisitioning cheque books
- Generating ATM Pins

In addition, the application would provide value added services like:

- generating email alerts for any / all transactions
- sending SMS alerts on transactions

Technology

- Operating System: Windows
- Mobile Platform: Android
- Front End: HTML, CSS, JSP or PHP and Android UI
- Middleware: Servlets / EJBs
- Development Tools: Eclipse / Netbeans
- Web Server: Tomcat / Glassfish
- Database: My SQL
- Other: Google App Engine, Google Maps

Benefit

A fairly niche area of technology would give good exposure to the students on mobile application development in and on Android. They would learn deployment and integration (with other applications) of such applications along with database design and implementation. Learning the Android platform would be a value added for many. They would get a basic learning of the rules of mobile / online banking and the implementation of the same complying with mandated security and risk guidelines. They would also learn the implementation of the SDLC as it is in a real time project development environment.

BANKER'S ASSIST

Description

Customers approach banks with various requests – could be to enquire upon their account balances, ask for a new cheque book, perform a transaction on their account – withdraw money, transfer money (do a wire transfer). A particular bank wishes to enhance its customer experience by providing reduced turn around time and accuracy of information pertaining to various possible operations / transactions that a customer may wish to perform when visiting a bank.

Requirements

The current process of verifying the customer and getting back to him / her with data and information of relevance is quite time consuming and this in turn implies loss in business opportunities. The bank thus wants a computerized system to be developed so as to enhance customer experience, reduce turn around time and increase customer services by meeting the following business requirements:

- Supports Origination for new customers
 - Create accounts for new customers. Collect all the information required to open a new account
- Support Origination for existing customers
 - Create multiple accounts (joint, joint with power of attorney, etc) for already existing bank customers.
 - Establish relationships of the customers with the various accounts
- Enabling listing and checking various types of accounts that a customer has
 - On searching and selecting a customer, all the accounts associated with the customer must be displayed.
 - The relationship (sole owner, secondary owner, etc) of the customer with each account must be displayed appropriately.
- Search for a Customer and / or customer information such as personal information, list of accounts, recent transactions, etc must be retrieved.
- Displaying / Printing Account Summary for a customer or group of customers
- Allowing Demographic updates online
 - Updating demographic changes such as address, phone number and billing address
- Perform a Wire transfer for the customer.

Essentially, this application would provide the Banker with a composite monitoring and customer servicing tool on his/her desktop.

JPMC Project Advisor

- Operating System : Linux / Windows
- Technologies : Spring / Spring webflow, JSP, Servlets, JDBC, XML
- Software Requirements : Apache Tomcat, JDK
- Database : MySQL
- IDE : Eclipse Galileo / Netbeans

Benefit

Being a core banking application, students get exposed to domain knowledge on one of the important aspects of customer / consumer banking. They would get an idea about the kind of queries customers have, the transactions that they seek and how these transactions can be facilitated / supported online. They would also get to know about security measures deployed in such

applications and learn about Risk and risk management in developing an application of this kind. All this along with going through various phases of the SDLC as implemented in an s/w development organization.

The technology exposure that they would get – implementing SOA, Web Services, using Spring / Spring Webflow, database designing and implementation.

Apart from understanding the SDLC thoroughly while developing the tool, students will also get to know the importance of various concepts like exposure to the real banking technologies e.g. Spring webflow, being acquainted to Service oriented Architecture, Multi-Tier and Distributed applications, etc.

HOME LOAN ORIGINATION

Description

A bank has launched a home lending campaign for the recent graduates and in response, there has been a huge increase in loan application traffic. The loan officers are unable to keep pace with this increased traffic and as a result, the bank is not able to tap potential customers in time. - This has also resulted in customer dissatisfaction as the response time is very high. The bank wishes to capitalize on the opportunity and also ensure that the customer experience is enhanced by providing reduced turn around time and accuracy of information pertaining to various possible home loans that a customer is looking for.

Requirements

The current process of verifying the customer and getting back to him / her with data and information of relevance is quite time consuming as it is largely a manual process. The bank thus wants to introduce a 1st level screening of applicants so as to filter out non-eligible ones and get the eligible applicants to the next steps in much lesser time than it currently takes. The possible way this could be achieved – a web based application which prospective customers will access. They would login, register themselves and input required information that the application would process and let them know their loan eligibility status. The application would maintain customer access history, customer data and customer status.

In accordance with the need, this application would aim to meet the following business requirements:

- Supports Origination for new customers
 - Create loan accounts for new customers. Collect all the information required to open a new account
- Enabling listing and checking various types of loans that a customer can avail
 - Provide all the various types of loans offered based on the customer's unique needs and the loan term
 - Provide a drop down to select the type of home loans such as a purchase or a refinance
- Enabling the customer to find his eligibility for a home loan based on the details furnished
 - The credit rating of the customer has to be calculated before proceeding for the further processing.
 - Eligible customers will be provided with inputs for the next steps for example, documents required for verification, visit to the bank, appointment dates etc.
- Search for the customer's loan account and/ or loan information such as the amount repaid, remaining loan term, interest details etc.
- Displaying / Printing Loan eligibility Summary for a customer or group of customers
- Provide for Admin functions :
 - Provide option to login as either a customer/admin/business user.
 - Enable update / delete / create user operations

Essentially, this application would provide the Banker with a composite pre qualification tool that helps perform the initial formalities pertaining to home loan origination by filtering the eligible/credible customers before moving forward with the loan processing.

Technology

- Operating System : Windows
- Development Tools : Eclipse / Netbeans, HTML, Java Script, JSP, Servlets
- Software Requirements : Apache Tomcat, JDK
- Database : MySQL

Benefit

Being a core banking application, students get exposed to domain knowledge on one of the important aspects of Mortgage Banking, essentially Home Loans. . They would get an insight into the life cycle of a loan -in particular a home loan and learn about functions and processes involved in Home Loan processing. They would also get to know about security measures deployed in such applications and learn about risk and risk management in developing an application of this kind. They would also go through various phases of the SDLC as implemented in a s/w development organization and understand various roles in a real-time project team. They will also learn about Multi-Tier and Distributed applications.

PROJECT BASED ROLES/ACCESS

Description

Project manager XYZ has 3 applications under him. He's unable to keep track of the roles assigned to the numerous people under these teams. He wants a system to be developed which would help in assigning roles and access to the team members upon approval. This would help him keep track of what each person on the team is working on and what role he/she has been assigned, in an easier manner.

It can be a standalone system that can be used by employees to request for roles/accesses to different parts of different projects under a line of business. The role/access is assigned after the approval from the manager. Once approved this system is updated to store information about the different roles that person has access to.

This stored data can also be used by the manager to keep track of what each person on the team is presently working on and by other team members as well to check what roles their colleagues have been assigned.

Product Features:

- Employee ID Verification
- History of Roles Existing for the Employee
- Email Alerts to the concerned Manager on request for a Role
- Updating the Roles held by an Employee
- The information should be useable for reporting purposes

Requirements

- Understand the different roles that exist in a project?
- Learn JSP and Servlets
- Interaction between Database and web app

When an employee is authenticated and allowed to apply for a specific role within his/her project, this request has to be send to the specific manager and validated. If approved, he/she should be granted the access or else they have to be informed of the denial and the reason for the denial also. All this information has to be saved in appropriate logs for later reference.

Technology

- Operating System : Linux / Windows
- Technologies : JSP, Servlets, JDBC, XML
- Software Requirements : Apache Tomcat, JDK
- Database : MySQL
- IDE : Eclipse Galileo / Netbeans

Benefit

The project would make students experience the complete SDLC beginning with understanding the business requirements, followed by functional requirements and then onto the other stages. In addition, they would gain to learn the Organizational importance of roles being defined and access being granted and how the same is implemented and used in Organizations for keeping track of Projects (as an activity in Project Management) and also for various other uses. They would also gain understanding of how exactly project reporting is done and the security issues that are involved in granting accesses based on the role of the employee.

AUTOMATED TIME TRACKING AND PROJECT REPORTING TOOL

Description

Time and attendance data tracking, given typical company practices, can be a difficult and labor-intensive process, particularly for large organizations with thousands of employees spread over several different sites. Getting accurate and adequate data pertaining to time and attendance is critical to several functions within a firm for example, salary / wage calculation, productivity analysis, time and effort estimations required to know the capacity of output, monitoring leaves etc. Traditionally, such information would be gathered on a site-by-site basis and transmitted by either manual or electronic means, to a central point for processing and generating required information for use. A software development firm intends to track the time reported by each team for various projects by developing an automated time tracking and project reporting tool that makes it easier to track project progress, hours posted for each phase of the project, general time tracking and ultimately increase the productivity in a cost effective manner.

The problems currently being faced are:

- Often, the information is outdated by the time it arrives.
- Delay in receipt of information causes delays in activities that are dependant on it for example salary / wage calculation.
- Errors might occur in manual time tracking and resulting in additional time and effort for reviews and corrections
- Employees may forget to log into registers at entry / exit time or project work start and end times.
- Tardiness and absenteeism cannot be effectively tracked and appropriately dealt with.
- Tracking the hours posted by each team member towards a project at every phase is difficult.

Requirements

The firm wants to have a software system which can help eliminate / reduce the above problems so as to accurately track the time for various projects and also meet other information needs that this data can provide, as mentioned above. This is going to be key in enhancing the productivity of the employees and also facilitate project planning and implementation.

In essence a 24 x 7 online software system which could be called a automated time tracking and project reporting tool needs to be developed that would:

- Capture the employee's log in and log out time from the installed Access Controls.
- Provide access to this data in various forms and formats for example, categorize time and attendance data availability by cost center, department and project code. This information could be used in payroll processing and also for other MIS needs like finding out how much cost has been incurred by a particular department and the like.
- Easily separate the regular time from overtime and alert a supervisor the moment an employee enters an overtime situation.
- Provide secure and controlled access to the information related to the hours posted by each employee. Data is accessible by both management and the concerned employee in real time.
- Provide weekly and monthly reports for the hours posted categorized by project, cost center and employee.
- Essentially perform time statistic analyzing and informative reporting capability for tracking billable hours and project analysis.

Technology

- Operating System : Linux / Windows
- Technologies : JSP, Servlets, JDBC

- Software Requirements : Apache Tomcat, JDK
- Database : MySQL
- IDE : Eclipse Galileo / Netbeans

Benefit

Students would gain to learn the Organizational importance of time tracking and how the same is implemented and used in Organizations for keeping track of Projects (as an activity in Project Management) and also for various other uses. In addition, students experience the complete SDLC beginning with understanding the business requirements, followed by functional requirements and then onto the other stages exactly the way a software development organization would implement the same. They would also gain understanding of how exactly project reporting is done and the security issues that are involved in automated time tracking.

DECISION SUPPORT SYSTEM / DECISION TREES

Description

In order to succeed in business, it's important to make the right decisions. Having the right tools to analyze the data and provide intelligent decisions are crucial in decision making.

This project is to build an algorithm to help make critical decisions like lending out loans and the probability of them paying back the loans.

Decision Trees are useful tools for helping you to choose between several courses of action. They provide highly effective structure within which you can explore options, and investigate the possible outcomes of choosing those options. This makes them particularly useful for choosing between different strategies, projects or investment options, particularly when your resources are limited.

The following are the few advantages with Decision support System:

- Speed up the process of decision making
- Helps automate managerial processes
- Creates a competitive advantage over competition

Problems being faced:

- Taking a decision manually will take a long time and is prone to human errors.
- If we do not take the right decisions at the right time, the business might be losing out on good opportunities.
- In order to give a healthy competition to our competitors we need to have quick and accurate decision systems in place.

The firm wants to have a web based decision supporting system, which eliminates the above problems and gives the users flexibility to access the application any where and any time and to get the right decisions. This is going to be the crucial application in business success as key decisions are taken based on this system.

Technology

- Visual Studio 2008
- ASP.Net
- C#
- IIS Server
- MS SQL Server 2005
- Java Script and CSS
- .Net framework Version-3.5

Benefit

Students would learn about the Decision systems and their importance in decision making process. They would get to learn about data structures and their efficient usage for a given business case. It will also help the students understand various phases of SDLC and how they are implemented in real time scenario.

RULES ENGINE FOR FRAUD DETECTION

Description

Bank ABC has been incurring losses due to a lot of fraudulent transactions lately. These transactions are either credit card transactions or online / web banking transactions that customers perform. In order to decrease the number of fraudulent transactions, ABC needs to come up with an application which would classify a transaction as safe / prone to risk based on a certain set of parameters that help judge the authenticity of a transaction for example, two transactions on the same credit card at Point of Sales which are located far away (different cities). This application would be called a Rules Engine which uses business logic to generate what is called a risk score for each transaction. The risk score is a numeric value generated to predict the likelihood that a transaction is a fraudulent or authentic. Depending on the risk score, the transaction details along with the score are passed on to a risk / transaction analyst for verification. A low risk score deems a transaction to be authentic, a mediocre score requires the transaction to be analyzed and a high score results in stopping the transaction.

This should help ABC in capturing such fraudulent transactions and preventing money from being lost. Additionally, the application would also keep track of the transaction history of the user, which will help identify / prevent fraud.

Requirements

Essentially, the Rules Engine would:

- Come up with a Risk Score for each transaction,
- Based on the Risk Score categorize the transaction as Authentic / Requiring Analysis / Possibly Fraudulent
- Trigger appropriate action / messages to linked applications to either let the transaction pass, forward it for analysis or reject it.
- Store the complete transaction history and data in respective log tables to enable generating reports to view and study customer / transaction history and patterns.

Technology

- Operating System: Windows / Linux
- Front End: HTML, CSS, JSP or PHP
- Middleware: Servlets / EJBs
- Development Tools: Eclipse / Netbeans
- Web Server: Tomcat / Glassfish
- Database: Oracle / My SQL

Benefit

Fraud detection / analysis and implementation of software systems to support the same is an area of immense importance / concern. Analysts and Software Engineers are working 24 x 7 to come up with finer and more formidable solutions to detect and prevent fraud. As such, this would be an excellent opportunity for the students to learn about fraud in credit card / online banking operation – the how of a fraud and also the means and measures financial institutions are adopting to prevent this. Technology exposure coupled with learning on risk would also be a takeaway from this project. Needless to mention, the SDLC would be implemented in complete as in a real time environment.

SOFTWARE CONFIGURATION MANAGEMENT TOOL

Description

A software development firm intends to enhance the development environment for its team to make it easier to track proceeds, progress, outcomes, get access to project assets and artifacts. The problems currently being faced are :

In ability to locate project documents on time and the right ones;

Getting fast access to a previous version of a software program or data file

Identifying changes that have been made along with the history of the same so as to meet certain stipulated compliance and regulator requirements

Tracking work proceeds for each team member

The firm wants to have an software system which can help eliminate / reduce the above problems so as to provide an easier environment for the project teams. This is going to be key in enhancing the productivity of the employees and also improved quality of services along with better time lines.

Requirements

In essence a 24 x 7 online software system which could be called a Software Configuration & Development Management tool needs to be developed that would:

- Provide secure and controlled access to software assets
- Enable access to project assets from anywhere, anytime
- Allow immediate access to virtually any version of a file
- Give control over personal workspaces and enables seamless access to the exact files and directory versions that are needed
- Provide visibility of who is doing what and when – tracing the origin and details of changes which helps meet compliance mandates
- Allow developers to work in their preferred environment

Technology

- Operating System : Linux / Windows
- Technologies : JSP, Servlets, JDBC, XML
- Software Requirements : Apache Tomcat, JDK
- Database : MySQL
- IDE : Eclipse Galileo / Netbeans

Benefit

The project would make students experience the complete SDLC beginning with understanding the business requirements, followed by functional requirements and then onto the other stages. In addition, they would gain understanding of - what are Repositories, Importance of Software versions, What is hijacking of code and how it could happen, Check-in and Check-out, Concurrency management, and the like, are of which are extensively used in the Software Development process.

ANDROID NFC QUICK BANKERS

Description

It is a time taking task for the customer to come to the bank, fill in a form/slip corresponding to a desired transaction and then go to the teller and get the transaction processed. It also is a time taking process for the teller to populate all the required fields from the given slip into his application and then process the transaction. Instead of taking time for all this process a technology called near field communicator can be used, where in when two android phones are brought in the vicinity of each other, i.e. about 1 to 3 cm distance, then the data gets transferred from one phone to another, in this case the customer fills in all the details required for the desired transaction in an android app, at his convenience and then walks into the bank.

The customer has to first get registered to the application provided by the bank. There he will be provided with forms which would ask for all the required details related to a transaction, on filling the details and hitting on submit, the customer will be provided with a unique code or number which would be encrypted and when the customer walks into the bank, all he has to do is take his phone in vicinity of the teller's sensor, which in current scenario would be another phone. His phone will be authenticated using the code provided to him and all the required data will be transfer to the teller's phone and then the remaining procedure to process a transaction would be continued.

This would reduce the efforts of the customer as well as the teller and save both their time.

Technology

- Operating System: Windows
- Mobile Platform: Android
- Front End: Android UI
- Middleware: PHP / windows services
- Development Tools: Android sdk 4.0, Encryption tools
- Web Server: Apache
- Database: My SQL

Benefit

A fairly niche area of technology, would give good exposure to the students on mobile application development in and on Android. They would learn deployment and integration (with other applications) of such applications along with database design and implementation. Learning the Android platform would be a value added for many. They would get a basic learning of the rules of mobile banking and the implementation of the same complying with mandated security and risk guidelines. They would also learn the implementation of the SDLC as it is in a real time project development environment.

BUSINESS REPORTING SYSTEM

Description

Today every organization deals with numbers and analytics to drive its business. From business intelligence to financial performance and strategy management to analytics applications, a reporting tool can provide what the organization needs to become top-performing and analytics-driven. It must be designed to help everyone in the organization make decisions that achieve better business outcomes for now and in the future.

A case study for Business reporting

Client: Major Retail Org

Core Business: Retail (*Retail is taken as example for ease of understanding; project should be able to run for any business*)

Location: Three countries, 2000 Stores

Products: 60000 products

Hierarchies:

1. People (Store Manager, Dept Manager , regional Manager, Director, CEO)
2. Product (Product ID, Group ID, Dept ID, Division ID, Enterprise ID)
3. Place/Location (Store, District, State, Region, Country)
4. Time (Hour/Day/Month/Quarter/Year)

Measures:

1. Sales by Store manager/Dept Manager by Product id/Dept by Store/District
2. Profit by Store by Department
3. Loss or Theft by Store by Month

Build a reporting solution that provides standard dashboard reports to executives. These reports are used by executives to take decisions on growth, product introduction/discontinuations, campaigns etc....

Requirements

The operations that are expected from the tool are as follows:

1. Tool should connect and navigate to a database
2. Should be able to classify Hierarchies and Measure
3. Should provide an ability to join Hierarchies and Measure to answer simple questions: ex: Which is the most profitable store? When (*Time*) did we do the best business? Who is my best performing manager? *etc*
4. The tool should provide an option for selection based on filters.
5. It should generate appropriate sql queries behind the scenes and fire on to the database.

The results should look as follows:

The results should be displayed in tabular format, graphical format such as bar-charts, pie-diagrams etc.

Technology

- Operating System : Windows
- Front End : JAVA
- Development Tools : Eclipse / Netbeans
- Database : My SQL / Oracle

Benefit

- Data Management is a niche field which is growing in demand and opportunities.
- ETL tools work as an integrator, extracting data from different sources; transforming it in preferred format based on the business transformation rules and loading it in cohesive DB known as Data Warehouse, making Data warehouse testing highly sensitive and high-profile.
- They would get to work on Databases (SQL's) as well as Java programming in the same domain.
- They would also get to learn the SDLC as it is real time project implementation.

DATA SET COMPARISON

Description

Regression testing is a key component of data warehouse development. In the first release, regression testing is used to ensure code stability by testing bug fixes for negative impacts to components that have already passed testing. While this is important for the first release, it is critical for the ongoing lifecycle of the data warehouse.

Subsequent releases will include new source systems, new business intelligence tools, and/or new data marts with new ETL driven data processing.

While regression testing is not unique to data warehousing, developing a good regression test plan is essential to ensuring that multiple future releases are deployed smoothly with little impact to the users. A best practice with regards to regression testing is the use of automated testing tools.

The Data Management team would like to automate their Data set comparison test case done as part of the Regression Testing.

Requirements

The operations that are expected from the tool are as follows:

- A Table to Table comparison by connecting to two different databases and joining them.
- A Table to File comparison.
- A File to File comparison.

The GUI of the tool is expected not to be cumbersome.

A simple, appealing interface where one can browse a file or establish a connection to the database is required.

The result of the comparison should be open to view in various formats as can be chosen from the GUI.

They are:

- Display the complete data sets, highlighting only the mismatches in Red or highlighting only the matches in Green.
- Display only the Lines/Records that don't match from the data sets.
- Display a Log file with complete details in a clear and precise report. E.g. clearly giving the row number and column number of the mismatch.

Technology

- Operating System : Windows
- Front End : JAVA
- Development Tools : Eclipse / Netbeans
- Database : My SQL / Oracle

Benefit

- Data Management is a niche field which is growing in demand and opportunities.

- ETL tools work as an integrator, extracting data from different sources; transforming it in preferred format based on the business transformation rules and loading it in cohesive DB known as Data Warehouse, making Data warehouse testing highly sensitive and high-profile.
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HOME LOAN ORIGINATION WITH GOOGLE CLOUD

Description

A bank has launched a home lending campaign for the recent graduates and in response; there has been a huge increase in loan application traffic. The loan officers are unable to keep pace with this increased traffic and as a result, the bank is not able to tap potential customers in time. - This has also resulted in customer dissatisfaction as the response time is very high. The bank wishes to capitalize on the opportunity and also ensure that the customer experience is enhanced by providing reduced turn around time and accuracy of information pertaining to various possible home loans that a customer is looking for.

The current process of verifying the customer and getting back to him / her with data and information of relevance is quite time consuming as it is largely a manual process. The bank thus wants to introduce a 1st level screening of applicants so as to filter out non-eligible ones and get the eligible applicants to the next steps in much lesser time than it currently takes. The possible way this could be achieved – a web based application which prospective customers will access. They would login, register themselves and input required information that the application would process and let them know their loan eligibility status. The application would maintain customer access history, customer data and customer status.

Requirements

In accordance with the need, this application would aim to meet the following business requirements:

- Supports Origination for new customers
 - Create loan accounts for new customers. Collect all the information required to open a new account
- Enabling listing and checking various types of loans that a customer can avail
 - Provide all the various types of loans offered based on the customer's unique needs and the loan term
 - Provide a drop down to select the type of home loans such as a purchase or a refinance
- Enabling the customer to find his eligibility for a home loan based on the details furnished
 - The credit rating of the customer has to be calculated before proceeding for the further processing.
 - Eligible customers will be provided with inputs for the next steps for example, documents required for verification, visit to the bank, appointment dates etc.
- Search for the customer's loan account and/ or loan information such as the amount repaid, remaining loan term, interest details etc.
- Displaying / Printing Loan eligibility Summary for a customer or group of customers
- Provide for Admin functions :
 - Provide option to login as either a customer/admin/business user.
 - Enable update / delete / create user operations

Essentially, this application would provide the Banker with a composite pre qualification tool that helps perform the initial formalities pertaining to home loan origination by filtering the eligible/credible customers before moving forward with the loan processing.

All this has to be done on Google cloud to enhance the advantages of the application for improved storage, access and security of data.

Technology

- Operating System : Windows
- Development Tools : Eclipse / Netbeans, HTML, Java Script, JSP, Servlets
- Software Requirements : Apache Tomcat, JDK

- Database : MySQL , Google cloud

Benefit

Being a core banking application, students get exposed to domain knowledge on one of the important aspects of Mortgage Banking, essentially Home Loans. They would get an insight into the life cycle of a loan, in particular a home loan and learn about functions and processes involved in Home Loan processing. They would also get to know about security measures deployed in such applications and learn about risk and risk management in developing an application of this kind. They would also go through various phases of the SDLC as implemented in s/w development organization and understand various roles in a real-time project team. They will also learn about Multi-Tier and Distributed applications.

ONLINE MUTUAL FUND INVESTMENT

Description

Online Mutual fund investment will be a feature available to the users already having online banking privileges. The main objective of this project is to simplify the mutual fund investment process by making it online. Users having online banking privileges can choose the mutual funds as per their choice after reviewing the fund related documents and then invest in that fund. The amount to be invested into the fund will be transferred from the user account to the fund account.

Requirements

The following are the functionalities will be available to the user as a part of this new feature,

1. A new link ('Online Mutual Funds') will be available to the users after they login into the bank website using their existing banking credentials.
2. **Search Mutual Funds Page:** This page will enable the users to search for the existing funds and new funds and upon clicking a particular fund user will be navigated to the detailed fund page.
3. **Detailed Fund Page:** This page will contain all the details about the mutual fund (as seen in the mutual fund brochures). Some links to the mutual fund parent website can also be made available. This page will also have a link/ button ('Invest') by clicking this; user can choose the investment options.
4. **Investment Option Page:** This page will enable the user to invest in the selected fund based on the available options. This page will display the name of the fund that user has selected in the previous fixed amount of Systematic Investment Plan (SIP) for a given time. After selecting the option, user has to submit the information for transaction to take place. In case enough funds are not available in the user account, system should show an alert. For SIP option user has to agree for auto debit from the account for the specified period.
5. **Financial Transaction:** This is an internal functionality which will create a record of the selected fund against the user account and based on the option selected it will complete the financial transaction. For fixed amount option, the amount entered by the user will be deducted from the user account and will be transferred to the fund account maintained by the Bank. In case of SIP option, the selected amount is transferred to the fund account from the user account every month till the completion of the period selected.
6. **Reports:** The following reports/alerts/emails should be generated by this system.
 - a) After successful completion of a financial transaction, an email should be sent to the user registered email ID. Additionally an SMS can also be sent to the user registered mobile number (not mandatory)
 - b) A report showing all the funds that the user has invested for a period of time. This can be split into two sub reports, a summary of all funds and detailed report of each fund with complete transaction details.

The following are the assumptions of this project:

- a) This new feature will be available only for Account holders with online banking privilege.
- b) Users can invest in only those funds that the bank is authorized for.
- c) The investment amount will be transferred to the fund account within the bank. In future this can be enhanced to transfer money to the actual fund account outside the bank.

Technology

- Operating System: Windows
- Middleware: Servlets
- Development Tools: Eclipse / Netbeans
- Web Server: Tomcat / Glassfish

- Database: My SQL

Benefit

Through this project, students would get nice exposure towards the banking domain especially online investments and the implementation of the same complying with mandated security and risk guidelines. They would get a basic learning of how the investments are carried out in the real time .This would give them a chance to enhance their programming skills learnt as a part of their curriculum. They would also learn the implementation of the SDLC as it is in a real time project development environment. It is the most relevant for anyone in these days, the familiarity with which enhances the creative impulses of the students. Awareness of schemes like these is the need of the hour.

PLAY STOCK STORM

Description

Internet Banking helped give the customer's anytime access to their banks. Customers are able to access the account details, bank statements, perform transactions like transferring money and pay their bills from home / office. However, with the rapid acceleration in mobile phone banking it has been possible to avail the services from anywhere and at anytime.

Android O.S is found on variety of smart phones and tablet devices, and xxx bank customers can use the same great banking application on many of them with free Mobile App.

Requirements

- Account Related Information
 1. Access account balances and transaction history
 2. Making term deposits and monitoring them
 3. Check book and card request
 4. status of check and stop payment on check
 5. Pay bills and credit cards with online Bill Pay
 6. Transfer money between other accounts in same bank.
- Find branches and ATM's near you.
- Security
 1. Security alert on unauthorized login through other devices (as and when happens).
 2. blocking lost/stolen cards

Module 2: Virtual game to understand the Real Business - Stock Storm!

A game to show (make user aware) personal investment benefits and risk (where and how). Like what are the diff ways to short time and long term investment. Every new customer or person thinks hundred times to invest in share. This game will be a learning phase for them. So that before investing in real time they can gain experience and mainly can understand risk and gain. In addition to stocks and indexes, there are options to experiment with Forex portfolios, penny stocks, mutual funds and short selling.

Beginners can execute market order-based trades in a "learning or beginners mode" without worrying about things like set hours, maximum number of trades per day, per stock and order expiration. A "real time mode" takes the user to the next level up the complexity after they've mastered the beginner level.

Players can manage up to four stock portfolios and three Forex portfolios on the site at once. For each portfolio, they select a starting value between \$200 and \$500,000 and set how much virtual commission is charged per trade. Users can create their own password-protected games as well, which is a feature that teachers find helpful for creating class competitions.

At the bank side a virtual stock market helps the user to play such games. Their performance will be observed and as and when it is found that some of the users are performing well bank can approach them for further investment with real time guides.

Technology

- Operating System: Windows
- Mobile Platform: Android
- Front End: HTML, CSS, JSP or PHP and Android UI
- Middleware: Servlets / EJBs
- Development Tools: Eclipse / Netbeans

- Web Server: Tomcat / Glassfish
- Database: My SQL

Benefit

A fairly niche area of technology, would give good exposure to the students on mobile application development in and on Android. They would learn deployment and integration (with other applications) of such applications along with database design and implementation. Learning the Android platform would be a value added for many. They would get a basic learning of the rules of mobile / online banking and the implementation of the same complying with mandated security and risk guidelines. They would also learn the implementation of the SDLC as it is in a real time project development environment.

SMART ATM TRACKER AND EASY PAY MOBILE APPLICATION

Description

ABC bank is working on enhancing its customer's experience by providing some smart applications that make the customer's work easier and quicker. The bank already has a mobile application that provides round the clock services to its customers. It now wishes to extend better service to the customers by also providing them with smarter and quicker ways to reach to a nearest ATM and pay bills. This is possible with the help of a "SMART ATM TRACKER MOBILE AND EASY PAY APPLICATION".

Requirements

Many times customers face difficulty in finding a nearest working ATM and lot of time gets wasted in the process. The SMART ATM TRACKER MOBILE APPLICATION solves this problem by helping the customer find a nearest working ATM. This smart mobile banking application does the following tasks for the customer:

- Locates the nearest working ATM and displays the address/addresses based on his current location.
- Checks the availability of the amount the customer wishes to withdraw at that ATM.
- Does the initial balance check and display if there is enough balance or not.
- If there is enough balance it goes ahead and through GPRS system guides the customer to that ATM address.
- Since the initial balance check has been done the customer should be able to receive the money immediately after the card is authenticated at the ATM. (We can have a mock up for this by using a simple web page to authenticate the card credentials and display the success message)

The bank also wants to provide a quick way for the customer to pay bills. Through EASY PAY the customer should be able to:

- Scan the QR code and make bill payments from his/her account.
- Receive SMS alerts with details of the transaction.

Technology

- Mobile Platform: Android
- Operating System: Windows
- Development Tools: Netbeans/Eclipse
- Web platform: Google cloud/Network cloud
- Front End: JSPs, CSS, HTML and Android UI
- Middleware: Servlets