SAP OOAD Projects

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# SAP OOAD Projects

## Project Scope

The project scope is performing a software application design (and development) of a level of complexity suitable for applying classroom learning on an actual project towards experiential learning. The project will simulate an Agile working model with iterative delivery while applying OOAD principles.

The list of projects is as below -

* P1 - Examination Processing System
* P2 - Photography Competition
* P3 - Waste Segregation and Management
* P4 - Online prescriptions
* P5 - School Student Transportation System
* P6 - Housing Loan System
* P7 - Sales Process Tracker
* P8 - Cafe Management System
* P9 - Interview Processing System

The scope of each project is described in subsequent sections.

## Project Team

Team Size = Maximum 4 people

## Deliverables

The project consisting of the following deliverables will evolve several iterations.

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| **#** | **Deliverable** |
| 1 | Use Case Model  Identify Actors and Use Cases  All use cases - provide titles in ‘I’ and brief/casual format in ‘E’ |
| 2 | Fully Dressed Use Cases  (at-least 3 use cases) |
| 3 | Domain Model  (Classes, Associations, Attributes) |
| 4 | System Sequence Diagram for Use Cases  Operation Contracts |
| 5 | UI Prototypes  (Hand or Tool Sketches) - [PPT/Video of navigation] |
| 6 | Design Class Diagrams |
| 7 | Interaction Diagrams - Sequence Diagrams or Communication Diagrams  Activity Diagrams  State Machine Diagrams |
| 8 | Skeleton Code |
| **#** | **The above is for Mid-Term Submission** |
| 9 | Document all fully dressed use cases  Refine the mid-term design for all use cases |
| 10 | Logical Architecture  (UML Packages, Layers, Model-View Separation) |
| 11 | Apply GRASP to improve object design |
| 12 | Apply Design Patterns - at-least 5 patterns |
| 13 | Demo working program of at-least 3 use cases |
| 14 | All deliverables consistent and submitted |
| **#** | **Submit all of the above for End-Term Submission** |

The deliverables will consist of -

* Individual or consolidated documents (refer above)
* StarUML diagrams
* Source code - pushed to GitHub
* Lessons Learnt - Mid-Term
* Lessons Learnt - End-Term - especially learning from applying GRASP and Design Patterns

These shall be organized in a Google Folder.

## Schedule

The iteration/deliverables will be due in + 7 days (that is a calendar week) from the completion of corresponding lecture. Students are encouraged to pace it with the course work.

Mid-Term Submission - 2 weeks prior to Mid-Term Exam

Fina Submission - 2 weeks prior to End-Term Exam

## Evaluation

The Evaluation Weightage is 20%, that is 20 marks out of 100 as Assignment.

The evaluation will be based on the completeness and consistency of deliverables with the extent of OOAD and Agile principles applied correctly.

# P1 - Examination Processing System

The candidates can register for the Examination, to be held on a certain date, across cities in Karnataka; with a city having one or multiple centers. The candidates need to meet a qualification criteria in order to appear for the examination - for example having passed a certain grade. The candidates need to provide requisite identity, address and qualification proofs. They need to pay the requisite examination fees. After the last date for submission of form is completed, the system should generate hall tickets for the eligible applicants. For applicants not eligible, it should provide a regret communication with reason. The candidate should be assigned examination center that is nearest to his/her residence. The evaluation results (marks or percentage or grade or rank or percentile ranking or a combination) of the candidates will be automatically uploaded from an external Evaluation System. This system should display the results to the candidates also provide results intimation by email or mobile.

# P2 - Photography Competition

An upcoming Photography magazine has launched Photography Competition in 3 categories - nature, people and architecture. The participants will submit a maximum of 1 photograph in each category along with the title of the photograph, along with participation fees. The judge panel will consist of 5 members who have to provide quantitative ratings (multiple parameters) [please read up domain material on how to rate a photograph] and qualitative remarks on the photographs. The photographs will be available for public voting too. To keep the voter’s interest the user interface will be dynamic and kept actively updated along with key statistics. Based on a certain weightage of judge panel ratings and public voting the top most 3 photographs in each category will be selected by the system. A senior judge will provide a summary evaluation of these and release the results. The winners will be presented with a cash award directly transferred to their bank accounts. The software should be able to scale up in future for more categories, different rating criteria, number of jury members, awards amounts etc.

# P3 - Waste Segregation and Management

BBMP is implementing the 2-bin-1-bag urban waste management system. [please read up on the domain]. Green - Organic, White - Dry waste, Red - reject waste. The garbage from households is picked up by a contractor and put into a collection van. The collection van travels door to door and have automatic measures to calculate the weight. The collection van is tracked with GPS until the waste is deposited in a landfill. The landfill owner confirms the weight deposited in order for payments to be done to contractor. The contractors are paid based on the weight picked in each category. BBMP may employ various contractors based on zone / constituency / wards / zip-code. Contractors uses the BBMP approved workers for waste collection. The workers are paid on an hourly basis by BBMP based on biometric attendance reporting system.

# P4 - Online Prescriptions

The doctors, pharmacy and patients are registered on the system. The doctors will prescribe the medications. The prescription will include generic, brand, dosage, frequency and instructions. The system will interface with a drug management system to show doctors alerts on drug-to-drug interaction. The doctor can accept the alert and change the prescription or override the alert with a justification. The patient will select the pharmacy to which prescription will be routed to. The pharmacy will pack the medicine and issue to the patient upon the payment. The price to be charged will be based on the MRP of the batch picked up. The issued batch # will be recorded in the bill. The pharmacy will have special offers and loyalty programs - for example senior citizen or silver / gold customers based on expenditure. On a monthly basis revenue and tax reports will be generated for pharmacy for their tax compliance. Certain medicines for example diabetes will require regular refills and both pharmacy & patients will be intimated about the same.

# P5 - School Student Transportation System

The security of school students as they travel between home and school is of utmost importance. The parents will be able to track online their wards as they are picked up and dropped with bus & driver details & route information. The route is pre-defined with boarding / disembarking points. The parents will also be sent an alert (sms, mobile) as their wards board and disembark the bus; and also when bus is nearing the stop (say 5 minutes away from the stop). The students will be tracked with latest biometric or RFID or barcode based technologies. The school security will be able to track the fleet as the bus proceeds between pick-up and drop points and the students travelling. They will also receive an overspeeding alerts and when bus deviates from the defined route. In case of accident the system will automatically detect and take photographs / short video of the incident and send to school security. The system will also integrate with the School Attendance System (time in / time out) to indicate that ward as has entered or departed from the school premises.

# P6 - Housing Loan System

The system is required by a leading housing finance company in India to automate it’s loan processing that is currently paper based. A customer will initiate the loan process with an online application to purchase or build a home with pre-requisite documentation. A sales representative will be assigned to the customer to assist in completion of the process. The system will interact with a property approval system if an apartment complex is pre-approved. If not pre-approved, then it will initiate a builder apartment approval request to the system. The submitted financial documents will be verified by a clerk against originals. A validation from an external credit approval agency will be done by the system. Based on these and business rules on loan amount, an officer will approve the loan amount. The loan term sheet, a legal document, will be accepted by customer that will include the financial details of the loans along with legal terms and conditions. The required property documents in original will be kept by clerk and filed. Based on these the loan amount will be disbursed to the customer with sales representative coordinating with accounting. In event of foreclosure or completion of the loan tenure with principal paid, a similar process will be followed to close the loan along with any pending payment from customer. The original documents will be returned to customer. The system will also track the EMI payments from the customer.

# P7 - Sales Process Tracker

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| The system is for an Indian Information Technology Company selling its services to international clients in multiple countries across the world, with a distributed sales team. The system will track the sales leads globally. This will include the clients information, prospective business (mapped to quarters) and the probability of the sale happening. A weighted score will be taken for revenue forecasting. As the sales go through its predefined stages the information will be periodically updated. The salespeople (foot soldiers) will be visiting multiple clients during the day and will update the visit details throughout the day. The regional sales manager will have a sales call every morning to review the updates from a previous day. The CEO and CFO will have a weekly call with the regional sales manager to evaluate the sales funnel. Based on the criticality and value of the deal, certain clients will be marked as HOT for closer tracking. Based on the sales deals getting to closure, the CEO’s global travels will be planned to visit customers. Various views will be available for the regional sales manager, CFO and CEO to visualize the funnel information. The sales commission payout to sales personnel will be determined by the system based on specific rules. P8 - Cafe Management System A leading Coffee House in Bangalore provides onsite coffee machines to its corporate customers on a service based model. Coffee machine dispenses a variety of beverages to its users. Based on number of cups dispensed for respective beverages, the Coffee House will bill its customer with a floor of minimum value that will be billed. The Coffee machines will be linked to the management system with latest technologies. The ingredients, that is inventory, to make the coffee will be tracked by the system, and replenishment requests will be sent to the supply management team. A centralized monitoring team will online monitor all the coffee machines deployed in the field. Any errors or alerts on the coffee machine will be triggered to the monitoring team. They can remotely log in to the coffee machine and troubleshoot. When need they will raise a service request to the service team to fix the problem. The problem will be tracked to closure by monitoring team. The management will be be able to visualize revenue on daily basis with projections of monthly revenues as they have to report the prospective revenue to investors. P9 - Interview Processing System The interview processing system will interface with the Job Application System. The HR and concerned manager will shortlist the candidates who have applied for a job role based on a weighted selection criterion of multiple parameters. The shortlisted candidates will be informed of the interview scheduled. There are likely to be multiple rounds of interviews - technical, managerial and HR. The status of each round of interviews along with the assigned schedule for upcoming round will be shown to the participants. The interviewer’s feedback in a structured format will be captured at each stage for company’s internal review and will not be accessible to the interviewee. HR will provide a job offer with digital signature and the candidate will accept or reject the same with digital signature. Upon acceptance, a joining checklist will be provided to the candidate and candidate will upload requisite documentation for the same. For management use, adequate reports and graphic visualization of the interview process and statistics will be provided. | |