SKYLINES

We believe you can fly.

TONGJI UNIVERSITY
JAVA ENTERPRISE DEVELOPMENT TECHNIQUES
COURSE PROJECT

PROJECT PROPOSAL

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TEAM

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PREFACE

Air transportation is one of the most important services to offer both significant social and economic benefits.

It gives a broad choice of holiday destinations around the world and is an affordable means to visit distance friends and relatives.

The airline business is characterized as being one of the most complex, involving multiple conflicting decisions that all need to be optimized at the same time.

INTRODUCTION

This project will be realized for the *Java Enterprise Development Techniques* course under the teaching of Professor Liu Yan of Tongji University.

For the final course project, we decided to design and develop an airline management system using J2EE to implement and format the website. The system can be compared to a company intranet providing functionalities in order to organize and manage a fictive airline company named as **SKYLINES**.

This document will expose at first the requirements and specifications of the project then the work plan and finally the data model design created for it.

The data model also contains the customer management system which is not a main feature of this project. It is here, in case we are able to succeed in the implementation of all the features of the company's intranet, to implement as a bonus the website that will manage all of the customer's functionalities.

REQUIREMENTS AND SPECIFICATIONS

The project is a web based application accessible and usable with a web browser. The online system will permit the management of an airline company.

Features

The intranet must include these functionalities:

- **Login/Account System:** The system a login page in order to limit the access only to company staff members. A role system must be implemented in order to differentiate an Administrator account with all privileges and Normal User account with normal usage privileges.

- **Staff Management:** We can manage the company staff, by adding or deleting employee and editing personal information. Moreover, we must have the possibility to dispatch crew and set employees salary.

- **Fleet Management:** This section of the system will allow the management of the airline's fleet. We can add or delete aircraft and manage it (set employee on aircraft, set aircraft registration or aircraft status).

- **Route Management:** Flight plans can be planned and assigned to specific aircraft of the company.

- **Price Management:** The price of plane tickets can be set with the system. A next upgrade of the system that includes customer booking system can be integrated and linked with tickets price.

The system must contain a job list that can be assigned to employees. Each job category will provide access to specific part of the system.

The job list is composed of:

- **System Administrator:** This is the administrator account, it can access to all functionalities of the system and can also reset password of user accounts.

- **Human Resources:** Can add and delete employee of the company. The user has the possibility to keep the employee personal information updated and set salaries.

- **Fleet Manager:** The fleet manager user can add or delete aircraft on the system. He can set aircraft registration number and manage its maintenance. He can also update the aircraft models in order to add new type of aircraft if aircraft manufacturer releases new models.

- **Airline Manager:** The airline manager role is to create flight plans and assign it to aircraft. The user can also create new destination airport, set ticket price and assign crew members to aircraft.

- **Pilot:** The pilot account can consult the assigned flight plans.

- **Cabin Crew:** Cabin crew job category is for employee management and has no interaction with the system in the first version of the intranet.

Technologies

The technologies used to develop the system are:

- **J2EE:** This is used to implement and format the information in the browser but also to generate dynamic web pages

- **AJAX:** Used to add user interactivity and data update without reloading pages.

- **SQL:** In order to retrieve and manage all the data

Development Environment

- **Glassfish Server:** Glassfish Server will be used to create a local web server in order to develop and test the system without uploading it online.

- **MySQL Server:** The database used to store all data for system operation is MySQL Server.

WORK PLAN

Employee Management

- ADD/DELETE/MODIFY Employee information
- SHOW Employee Profile
- ASSIGN Employee to Aircraft

Assigned to: THAI Jean - EA Loyd

Flight Management

- ADD/DELETE/MODIFY Flight planning
- ASSIGN Flight to Aircraft
- ADD/DELETE/MODIFY Destination Airports

Assigned to: PIENWITTAYASAKUL Chatri

Aircraft Management / Maintenance

- ADD/DELETE Company Aircraft
- SHOW Aircraft Status
- ADD/DELETE/MODIFY Aircraft model
- SEND TO MAINTENANCE
- REPAIR

Assigned to: MA Catherine - WANG Velan

DATA MODEL

class Schema1

JOB
«column»
*PK ID: NUMBER(10)
*   JOB_NAME: VARCHAR2(255)
*   MIN_SALARY: NUMBER(8,2)
*   MAX_SALARY: NUMBER(8,2)

«PK»
+   PK_JOB(NUMBER)

«unique»
+   UQ_JOB_JOB_NAME(VARCHAR2)
+   UQ_JOB_ID(NUMBER)

EMPLOYEE
«column»
*PK ID: NUMBER(10)
*   NAME: VARCHAR2(255)
*   ADDRESS: VARCHAR2(255)
*   PHONE: VARCHAR2(20)
*   REGISTRATION_DATE: DATE
FK HUB: CHAR(4)
*FK JOB_ID: NUMBER(10)
FK AIRCRAFT_ID: NUMBER(10)
*   SALARY: NUMBER(8,2)
*   TEAM_ID: NUMBER(10)
*FK POSITION: CHAR(4)

«FK»
+   FK_AIRCRAFT_ID(NUMBER)
+   FK_EMPLOYEE_AIRPORT(CHAR, CHAR)
+   FK_EMPLOYEE_JOB(NUMBER)

«unique»
+   UQ_EMPLOYEE_ID(NUMBER)
+   UQ_EMPLOYEE_TEAM_ID(NUMBER)

«PK»
+   PK_EMPLOYEE(NUMBER)

SYSTEM_ACCOUNT
«column»
*   ID: NUMBER(10)
FK RELATED_EMPLOYEE: NUMBER(10)
FK RELATED_CUSTOMER: NUMBER(10)
*   LOGIN: VARCHAR2(50)
*   SALT: VARCHAR2(255)
*   PASSWORD: VARCHAR2(255)
*FK ROLE: NUMBER(10)
*   LAST_LOGIN: VARCHAR2(50)

«FK»
+   FK_SYSTEM_ACCOUNT_CUSTOMER(NUMBER)
+   FK_SYSTEM_ACCOUNT_EMPLOYEE(NUMBER)
+   FK_SYSTEM_ACCOUNT_ROLES(NUMBER)

«unique»
+   UQ_SYSTEM_ACCOUNT_ID(NUMBER)

ROLES
«column»
*PK ID: NUMBER(10)
*   ROLE_NAME: VARCHAR2(255)

«PK»
+   PK_ROLES(NUMBER)

«unique»
+   UQ_ROLES_ID(NUMBER)
+   UQ_ROLES_ROLE_NAME(VARCHAR2)

AIRPORT
«column»
*PK ICAO: CHAR(4)
*   NAME: VARCHAR2(255)

«PK»
+   PK_AIRPORT(CHAR)

«unique»
+   UQ_AIRPORT_ICAO(CHAR)

LOG
«column»
*   ACCOUNT_ID: NUMBER(10)
*   LOG_TIMESTAMP: VARCHAR2(50)

CUSTOMER
«column»
*PK CUSTOMER_ID: NUMBER(10)
*   NAME: VARCHAR2(255)
*   ADDRESS: VARCHAR2(255)
*   PHONE: VARCHAR2(20)

«PK»
+   PK_CUSTOMER(NUMBER)

«unique»
+   UQ_CUSTOMER_CUSTOMER_ID(NUMBER)

AIRCRAFT
«column»
*PK ID: NUMBER(10)
*   MODEL_ID: NUMBER(10)
*   AIRCRAFT_REGISTRATION: VARCHAR2(50)
*   FLIGHT_HOUR: NUMBER(8,2)
FK FLIGHT_NUMBER: NUMBER(10)
*   AIRCRAFT_STATUS: CHAR(1)
*FK POSITION: CHAR(4)

«FK»
+   FK_AIRCRAFT_AIRPORT(CHAR)
+   FK_AIRCRAFT_FLIGHTPLAN(NUMBER)

«unique»
+   UQ_AIRCRAFT_AIRCRAFT_REGISTRA(VARCHAR2)
+   UQ_AIRCRAFT_ID(NUMBER)

«PK»
+   PK_AIRCRAFT(NUMBER)

FLIGHTPLAN
«column»
*PK FLIGHT_NUMBER: NUMBER(10)
*FK FLIGHT_TYPE: NUMBER(10)
*FK DEPARTURE_AIRPORT: CHAR(4)
*FK ARRIVAL_AIRPORT: CHAR(4)
*   DEPARTURE_TIME: CHAR(4)
*   ARRIVAL_TIME: CHAR(4)
*   FLIGHT_ROUTE: VARCHAR(2048)
*   NEXT_FLIGHT: NUMBER(10)

«FK»
+   FK_FLIGHTPLAN_FLIGHT_TYPE(NUMBER)

«unique»
+   UQ_FLIGHTPLAN_FLIGHT_NUMBER(NUMBER)

«PK»
+   PK_FLIGHTPLAN(NUMBER)

AIRCRAFT_TYPE
«column»
*PK TYPE_ID: NUMBER(10)
*   TYPE_NAME: VARCHAR2(255)

«PK»
+   PK_AIRCRAFT_TYPE(NUMBER)

«unique»
+   UQ_AIRCRAFT_TYPE_TYPE_ID(NUMBER)
+   UQ_AIRCRAFT_TYPE_TYPE_NAME(VARCHAR2)

FLIGHT_TYPE
«column»
*PK ID: NUMBER(10)
*   TYPE_NAME: VARCHAR2(255)

«PK»
+   PK_FLIGHT_TYPE(NUMBER)

«unique»
+   UQ_FLIGHT_TYPE_ID(NUMBER)
+   UQ_FLIGHT_TYPE_TYPE_NAME(VARCHAR2)

BOOKING_INFO
«column»
*PK ID: NUMBER(10)
*FK FLIGHT_NUMBER: NUMBER(10)
*   FCLASS_PRICE: NUMBER(8,2)
*   BCLASS_PRICE: NUMBER(8,2)
*   ECLASS_PRICE: NUMBER(8,2)
*   CARGO_PRICE: NUMBER(8,2)

«unique»
+   UQ_BOOKING_INFO_ID(NUMBER)

«FK»
+   FK_BOOKING_INFO_FLIGHTPLAN(NUMBER)

«PK»
+   PK_BOOKING_INFO(NUMBER)

RESERVATION
«column»
*PK RES_ID: NUMBER(10)
*FK BOOKING_INFO_ID: NUMBER(10)
*FK CUSTOMER_ID: NUMBER(10)
*   CLASS: CHAR(1)
*   QUANTITY: NUMBER(8,2)
*   RESERVATION_DATE: DATE

«FK»
+   FK_RESERVATION_BOOKING_INFO(NUMBER)
+   FK_RESERVATION_CUSTOMER(NUMBER)

«unique»
+   UQ_RESERVATION_RES_ID(NUMBER)

AIRCRAFT_MODEL
«column»
*PK MODEL_ID: NUMBER(10)
*   AIRCRAFT_MODEL: VARCHAR2(255)
*FK AIRCRAFT_TYPE: NUMBER(10)
*   REQUIRED_PILOT: NUMBER(2)
*   REQUIRED_STAFF: NUMBER(2)
*   MAX_PASSENGER: NUMBER(3)
*   MAX_CARGO: NUMBER(10)

«FK»
+   FK_AIRCRAFT_MODEL_AIRCRAFT_TYPE(NUMBER)

«unique»
+   UQ_AIRCRAFT_MODEL_MODEL_ID(NUMBER)

«PK»
+   PK_AIRCRAFT_MODEL(NUMBER)

Relationships:
+FK_SYSTEM_ACCOUNT_EMPLOYEE (RELATED_EMPLOYEE = ID)
+FK_SYSTEM_ACCOUNT_ROLES (ROLE = ID) +PK_ROLES
(JOB_ID = ID) +FK_EMPLOYEE_JOB / +PK_JOB
+PK_EMPLOYEE
+FK_SYSTEM_ACCOUNT_CUSTOMER
(RELATED_CUSTOMER = CUSTOMER_ID)
+PK_CUSTOMER
(HUB = ICAO) +FK_EMPLOYEE_AIRPORT
+PK_AIRPORT
(POSITION = ICAO)
(DEPARTURE_AIRPORT = IATA)
+FK_FLIGHTPLAN_AIRPORT
+AIRCRAFT_ID
(AIRCRAFT_ID = AIRCRAF1)
+UQ_AIRCRAFT_ID
+FK_AIRCRAFT_AIRPORT
+PK_FLIGHTPLAN +FK_AIRCRAFT_FLIGHTPLAN
(FLIGHT_NUMBER = FLIGHT_NUMBER)
+FK_AIRCRAFT_AIRCRAFT_MODEL
(CUSTOMER_ID = CUSTOMER_ID)
+FK_RESERVATION_CUSTOMER
+PK_AIRCRAFT_TYPE
(AIRCRAFT_TYPE = TYPE_ID)
+FK_AIRCRAFT_MODEL_AIRCRAFT_TYPE
+PK_AIRCRAFT_MODEL
+FK_FLIGHTPLAN_FLIGHT_TYPE (FLIGHT_TYPE = ID)
+PK_FLIGHT_TYPE
+FK_BOOKING_INFO_FLIGHTPLAN (FLIGHT_NUMBER = FLIGHT_NUMBER)
+FK_RESERVATION_BOOKING_INFO (BOOKING_INFO_ID = ID)
+PK_BOOKING_INFO

GANTT DIAGRAM

ID	Task name	Start date	End date	Duration	Responsibility
1	Project Idea, Analysis, Project Plan creation	1/4/2013	5/4/2013	5j	ALL
2	Project Validation	8/4/2013	8/4/2013	0j	
3	Final Project Plan Creation	8/4/2013	9/4/2013	2j	ALL
4	Database Design and Validation	10/4/2013	10/4/2013	1j	ALL
5	Database implementation	11/4/2013	11/4/2013	1j	EL
6	Design Template Creation	12/4/2013	12/4/2013	1j	TJ
7	Flight Management Module Use Case and User Interface Definition	12/4/2013	26/4/2013	11j	PC
8	Aircraft Management Module Use Case and User Interface Definition	12/4/2013	26/4/2013	11j	MC
9	Aircraft Maintenance Module Use Case and User Interface Definition	12/4/2013	26/4/2013	11j	WV
10	Employee Module Use Case and User Interface Definition	12/4/2013	26/4/2013	11j	EL
11	Account System Design and Implementation	15/4/2013	19/4/2013	5j	TJ
12	Module Use Case and User Interface Validation	22/4/2013	26/4/2013	5j	TJ
13	Servlet Design	22/4/2013	3/5/2013	10j	ALL
14	Flight Management Module Servlet Implementation	29/4/2013	8/5/2013	8j	PC, TJ
15	Aircraft Management Module Servlet Implementation	29/4/2013	8/5/2013	8j	MC
16	Aircraft Maintenance Module Servlet Implementation	29/4/2013	8/5/2013	8j	WV
17	Employee Module Servlet Implementation	29/4/2013	8/5/2013	8j	EL, TJ
18	Flight Management Module JSP and AJAX Implementation	9/5/2013	31/5/2013	17j	PC
19	Aircraft Management Module JSP and AJAX Implementation	9/5/2013	31/5/2013	17j	MC
20	Aircraft Maintenance Module JSP and AJAX Implementation	9/5/2013	31/5/2013	17j	WV
21	Employee Module JSP and AJAX Implementation	9/5/2013	31/5/2013	17j	EL
22	Middle term assessment and demonstration	15/5/2013	15/5/2013	0j	
23	Test and Deployment	3/6/2013	14/6/2013	10j	ALL
24	Final submission and presentation	17/6/2013	17/6/2013	0j	

Responsibility Key
ALL – Everyone in the Group
TJ – Thai Jean
PC – Pienwittayasakul Chatri
EL – Ea Loyd
MC – Ma Catherine
WV – Wang Velan