**FREIGHTOPS DEVELOPER GUIDE**

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1. Environment Setup
   * Java JDK
   * Apache Tomcat
   * Eclipse IDE Workspace - import the project from Git repo
   * MySQL
     + Download from this link: http://dev.mysql.com/downloads/installer/5.6.html
     + Install recommended settings or just include the connectors and applications like MySQL Workbench (can be used for Reverse Engineering, table/data export and data model generation) and Notifier (can be easily used to start/stop MySQL server and open the workbench for its SQL editor)
     + Start MySQL server.
     + Open MySQL Workbench. Go to Server > Data Import. Import the script: \freightops-web\src\main\sql\ernest v1.1.sql
2. Dependency Libraries
   * Spring + Hibernate dependencies were configured in maven pom.xml file
   * Struts + Tiles libraries were placed in \freightops-web\src\main\webapp\WEB-INF\lib folder, there are some version compatibility issues when adding to maven (**TODO: Integrate to maven pom.xml**)
3. Hibernate
   * Configured in \freightops-web\src\main\resources\hibernate.cfg.xml and by using ORM hibernate annotations in the entities located in \freightops-web\src\main\java\com\sr\freightops\entity folder.
   * Reference to hibernate: http://www.tutorialspoint.com/hibernate/
   * Reference to Struts 2 + Hibernate: http://www.tutorialspoint.com/struts\_2/struts\_hibernate.htm
4. Spring
   * Check the configuration file \freightops-web\src\main\webapp\WEB-INF\applicationContext.xml where all the wiring of the beans are created
   * ContextLoaderListener should be added as a listener in \freightops-web\src\main\webapp\WEB-INF\web.xml for Spring to work and correct maven dependencies in pom.xml
   * Reference to Struts 2 + Spring: http://www.tutorialspoint.com/struts\_2/struts\_spring.htm
5. Tiles
   * Check the configuration file \freightops-web\src\main\webapp\WEB-INF\tiles.xml which defines the baseLayout template jsp for the framing of the page
   * StrutsTilesListener should be added as a listener in \freightops-web\src\main\webapp\WEB-INF\web.xml for Tiles to work and some jar dependencies placed in \freightops-web\src\main\webapp\WEB-INF\lib
   * Reference to Struts 2 + Tiles: http://www.tutorialspoint.com/struts\_2/struts\_tiles.htm
6. Login (**TODO: To use more secured open source security technology like Spring Security or Apache Shiro with "Remember Me" feature**)
   * Implemented just a simple hibernate retrieve user/password(not encrypted yet) from the database just for showing hibernate retrieve flow using DAO as a sample code and for easy startup of the project
   * Look at \freightops-web\src\main\webapp\login.jsp, you will see the action declared in the s:form tag. Then, look at the actions defined in \freightops-web\src\main\resources\struts.xml. So, after submit button is clicked in the login page, it will go to LoginAction to retrieve the user with the given username/password, then if there's a match, put the UserBean to sessionAttributes map. Using Struts 2 Interceptors defined in \freightops-web\src\main\resources\struts.xml, it will check if the user
   * Reference to interceptors: http://www.tutorialspoint.com/struts\_2/struts\_interceptors.htm
7. Retrieve User List Flow
   * Just another retrieve flow using hibernate and dao method UserDao.findAllUser() but there are programmatically coded retrieval of the value given the key(should be the one saved in the parent table, in this instance "ernest.user" table) of some Parameter associated column(can be a dropdown in the create page) like for example, User Status(key=ACTIVE, value=Active) or Account Type(key=ACCT\_STAFF, value=Staff).
8. All the links, for pages which were not created yet, they will be redirected to pageUnavailable page for now. Please check struts.xml and LinkAction for specific details.
9. For adding a new entity, make sure to double check correct usage of hibernate annotations and correct table/column names.
10. For adding a new Dao:
    * Create an Interface and DaoImpl.
    * Make sure to put @Transactional before the class name for spring session management or else there will be error saying "No Session found for current thread"
    * Add the Dao bean in applicationContext.xml and which service will call it
    * Only generate the setter method in the ServiceImpl for the Dao.
11. For adding a new Service:
    * Create an Interface and ServiceImpl.
    * Make sure to put @Transactional before the class name for spring session management
    * Add the Service bean in applicationContext.xml
    * Call multiple Dao if needed.
12. For adding a new flow (view, add, delete):
    * Make sure to create an entry in tiles.xml corresponding to the action result value in the struts.xml to extend the baseLayout tiles template and assign the new jsp page to the body of the template.
    * Make sure to create corresponding Struts Actions java files depending on if there are links or buttons to trigger any event/action.
      + Implement UserBeanAware and ModelDriven<UserBean> if you need logged on user info, as for example UserListAction, we need the logged on username to be displayed at the right upper level of the screen for example, "Welcome, Ronnie Mar Ramos".
      + Determine all the actions and the service that you will need and configure them in spring applicationContext.xml
13. Logging
    * Update the path of the appender FILE value of \freightops-web\src\main\resources\log4j.xml
    * Reference: http://www.mkyong.com/struts2/struts-2-log4j-integration-example/
14. Deploying the application to the web server (Tomcat)
    * Use export war file in Eclipse and run the Tomcat server externally, because you may probably encounter error if running Tomcat from Eclipse and deploy from there
15. **Team's TODO Lis**t beside from the others mentioned above:
    * CSS is just a copy from the tracker app but modified some of the colors of the element classes (\freightops-web\src\main\webapp\styles). Need further modifications based on the new requirements for the "Look and Feel"
    * Need to revisit images copied from tracker app in this folder(\freightops-web\src\main\webapp\images) if we want to use some icons, buttons, image src, logos or else clean it up.
    * This file \freightops-web\src\main\resources\global.properties has contents that were also copied from tracker app with some additional entries, need to clean up all which will not be used in the page.
    * Add findAll() methods for DaoImpl except for UserDaoImpl which I already created. I just forgot to add it to other classes.
    * Create JUnit Test cases on all the java files.
    * Maven modules can be created to separate server side codes to the main web app or can separated by functionality and also can be refactored to have a core module which may contain common reusable codes to all modules. Maven guru can set this up.
    * Research on how to generate graphs and tables which is compatible or can integrate with the open source technologies that we are currently using.
    * Review all the codes and make necessary modifications based on the requirements.

Note: This web-app is created based on first assumption that the project is aiming to go similar to the tracker app. Also, many codes are yet to be reviewed, cleaned-up and enhanced.