|  |  |
| --- | --- |
| **Group Project Report** | Believer - Team 19 |
| **Date of Submission** | 12 May 2017 |
| **Expected Submission Date** | 12 May 2017 |
| **Project Title** | Travel Dashboard |
| **Sponsoring Company (CS if local only)** | Atos |
| **Contact Person** | Matthew Evans & David Jenkinson |
| **Contact Email** | matthew.evans@atos.net  david.jenkinson@atos.net |
| **Project Supervisor <or as above for local>** | Natasa Milic-Frayling |
| **Supervisor Email** | Natasa.Milic-Frayling@nottingham.ac.uk |
| **Group members names and emails** | |
| Syed Jaber-Al-Mahmood psyjs15@nottingham.ac.uk | |
| Niall Garratt psyng@nottingham.ac.uk | |
| Zequn Yu psyzy5@nottingham.ac.uk | |
| Lukas Aleksa psyla@nottingham.ac.uk | |
| James Clark psyjjcl@nottingham.ac.uk | |
| **Project Background Information** | |
| Atos is the leading IT services provider around the world. Atos currently has a multi-layered approach to travel, and uses a claim system to produces Excel file of travel claims information. To gain a valuable summary report, the managers have to spend hours on big Excel file, and analyse a significant amount of data manually. This makes the ability to track, analyse, and audit travel very difficult. The purpose of Travel Dashboard is to therefore take the raw data of different Excel file schemas currently available from Atos, perform analytics, and produce a summary report to present the information in a consumable format.  Agile methodology is used during the development process. Based on the user requirements, the system is designed to achieve functionality in three aspects.  The first part is the login system. In Atos, different managers only have access to the data of their own team. Since the current login system is not available to the team, higher managers should be allowed to register an account, and login to see the data and analysis of their own data. Atos has two types of users for this system: project manager and team leader in different hierarchy (project manager higher than team leader). When the prototype was produced, Atos mentioned that the Excel files are only distributed to the higher managers, and the team leaders should not be able to use the system, except received redistributive data from the superior project manager. Then, project manager and team leader can be regarded as one type of user when using the system. Therefore, the system has been updated accordingly to fit this requirement.  The second part is the upload system. The key point of the project, is to allow the user to gain valuable data automatically analysed by the system. The upload system provides an API to input the Excel file data to the system. As the data is from different sources, two different types of Excel files were given to the team. Therefore, the upload system need to perform different strategy towards different file type, and to store the information using a specified type to the database.  The final part is analysis system. The data stored in the database need to be analysed and a summary report should be available to the user. The manager is looking for the report of a whole team, as well as the report of individuals. The report should be viewed in selected time interval, cost element and location. To perform a consumable format, the analysis system should allow the user to generate the summary report in PDF version.  To meet the above user requirements, the team decided to produce the Travel Dashboard using Java for building the main system, JavaFx for user interface, and MySQL for database to store data. | |
| **Progress on Work at Time of End of Contract** | |
| **What have been achieved?**  Travel Dashboard system is designed to help Atos managers tracking team travel claims, analysing the data, and planning the budgets in a more effective way. As required, the Travel Dashboard is designed to consist of four parts: login system, main dashboard, upload section and report section.  The **login system** allows the user to register an account and login to the system. The user information is stored in MySQL remote database. User password is encoded using SHA-256 for security reason.  The **main dashboard** provides a general view to the user based on the analysis of uploaded data. In main dashboard the user can also have a general view of uploaded files information and the budgets of the team in comparison with the actual cost. From the main dashboard the user can set and change half-year budget. The comparison chart is going to be updated instantly.  The **upload section** provides an API for the user to easily select the file type according to different schema of Excel file from Atos, and upload the file into the system. The essential information that is used to generated the summary report will be stored into the MySQL database and all special cases and text format will be automatically handled. The upload section also provides a chart so that the user can view the upload history and easily delete specific file if that part of data is no longer needed.  The **report section** allows the user to select several options to generate a report in details, and produce a PDF version of that report if necessary. The report is based on selected WBS number, and can be specified as whole team or individual under that WBS number. The user can select between two different time options to generate the report. In report page, different time interval options are provided: whole time, year, quarter, month and week. The report gives thorough information of claim time, cost element and location. As required by Atos, a hover over effect on the team member chart is included to displays that employees’ expenses compared with the average level of the team, if the report is selected as whole team. The hover over effect is one of the improvements that have been made to the system based on the client’s feedback. This section also allows the users to generate a PDF version file based on user choice.  All the main requirements are achieved and the software is tested to run stably. Code in Java and MySQL is written in consistent and elegant style after several times refactoring (for example PDF file solution). The need to separate developing code and existing code is fully recognised, and the file structure of the project is organised concisely and clearly. Besides, the team provides several elaborated documentations, in reflection of the development process:  **Project Management:**  Git (see the link below)  User case study (Git: Documentations/Documentations.docx P8)  Meeting minutes (Git Documentations/MeetingMinutes.docx)  Trello (see the link below)  Risk analysis report (Git: Documentations/Documentations.docx P10)  Gantt chart (Git: Documentations/, 5 mpp files)  Powerpoints for meeting (Google Drive/Meetings, link provided below)  **Documentations**  Java Doc (Git: TravelDashboard/doc)  User guide (Git: Documentations/Documentations.docx P13)  Installation guide (Git: Documentations/Documentations.docx P33)  Database documentation (Git: Documentations/Documentations.docx P53)  Black and white test documentation (Git Documentations/TestReport.xlsx)  Final Report (This report)  **Please note to read README.md before trying to run the system.**  **What we have not been able to achieve?**  The team has taken all the requirements very carefully and included every of the functions which have been specified by Atos. However, there are some issues and limitations that need to be aware of. Also, the following information may help any technical team to take over this project and improve it in the future.  - **File limitation**: Excel File that contains more than 10,000 rows can potentially cause a failed upload, and the file can be damaged during the process of upload. The reason is due to the limitation of Apache POI XSSF which have been used for this system. Please refer to Apache POI official documentations: [Apache POI](http://poi.apache.org/spreadsheet/how-to.html#xssf_sax_api). The project could be built using XSSF, however, the parser need to be written as Apache have not provided any easy-to-use API.  **- Forgotten Password:** The initial idea is raised from the team. The user can retrieve the password via email server. However, the testing database server can not provide reliable email server. This can be solved when the database is migrated to Atos database server.  **- File Types:** The system currently allows only two types of files. The files which will be uploaded by the users must follow the schema of one of these files, because the system currently examines certain columns by their column numbers in the file. To add new file type, please refer to Java Doc for more details.  **What can be achieved with the system in the future?**  The travel dashboard system has a lot of potentials which can be achieved easily by improving the system, such as:  **Using Atos’ database and integrating systems.** As mentioned before, Atos uses a claim system that produces an excel report with all the expenses. Using Atos’ database, issues such as forgotten password can be solved. In addition, during the development process, many problems are caused due to the wrong user input into Atos’ claim system, which lead to many “special case” that need to be handled individually. Many potential problems can be avoided when the claim system takes stricter rules to prompt employee input. This will surely reduce the amount of effort of improving Travel Dashboard, for example, adding new file type to the system.    **Using Artificial Intelligence to determine the cost**. This allows the user to predict the expenses for the company and take appropriate actions in order to prevent going over their budget.  In conclusion, the team has covered all the functionalities that the Atos team requested to include in the system. For the future of the project, the team plans to keep contact with Atos, contributing to long-term maintenance of the project, improving and expanding the Travel Dashboard over Atos. | |
|  | |

|  |  |
| --- | --- |
| Documentation of the project is here. | <https://drive.google.com/drive/folders/0B09zzUIA23jnM05qREMwX0dQaWs?usp=sharing> |
| The code repository is here | <https://projects.cs.nott.ac.uk/psyzy5/G52GRP_TEAM19_2016_Beliebers> |
| Other project management documents (e.g. Trello boards) are here. | Backend Development- <https://trello.com/b/6nidMYtv/backend>  Frontend Development- <https://trello.com/b/gDCIeEvn/design>  Test- <https://trello.com/b/nelg3eGp/test>  Meetings- <https://trello.com/b/Bvt1NQ5E/meeting>  Documentations- <https://trello.com/b/tjUe2eIq/documentation> |