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Qatar University

CMPS – 310 Software Engineering - L01- B03 Fall 2021

Course Project Milestone 1

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**Submit Date:** 14 – 10 – 2021

* **Data Flow Diagram (DFD).**

Diagram

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* **use case diagram.**

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* **The Explanation of the best way to analyze the system.**

We prefer to use the Data Flow Diagram (DFD) to analyze the system because it shows the details of each process of the system how it goes through the process, while the Use Case Diagram (UCD) it only shows the relations between the actors and the system without showing how to data will be processed.

* **Use cases specification template.**

**1.a)**

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| **Use case Id:** **UC001** | **Cancel visa** | |
| **Brief Description** | **The applicant provides the visa number. The system finds the visa information and change visa status to “canceled”.** | |
| **Primary actors** | **Applicant** | |
| **Trigger(s)** | **Applicant enters** **visa number** | |
| **Preconditions:**  **1-Applicant must have existing visa.**  **2-Applicant must provide valid visa number.** | | |
| **Post-conditions:**  **Visa has been canceled successfully.** | | |
| **Normal Scenario** | | |
| Actor Action | | System Response |
| **1. Applicant submits his/her visa number.** | | **2. finds visa information.** |
|  | | **3. makes status of visa to be “canceled”.**  **(See 3.a. for alternative flow)** |
|  | | **4. decrements total number of visas assigned to the employee by one. (See 4.a. for alternative flow).** |
|  | | **5. notifies AccSys about cancellation.** |
|  | | **6. informs the applicant about cancellation.** |
| **Alternative flows:**  **3.a. if it is for a work visa, the Immigration Officer must approve the cancelation.**  **4.a. if it is not a work visa, no need to decrement.** | | |

**1.b)**

**Diagram

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**2.a)**

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| **Use case Id: UC002** | **Request for extension** | |
| **Brief Description** | **The applicant provides his visa number then, the system calculates his remaining period of the visa. After paying the extension fees, the AccSys sends the receipt to the system to apply the extension on visa.** | |
| **Primary actors** | **Applicant, AccSys** | |
| **Trigger(s)** | **Applicant enters visa number** | |
| **Preconditions:**  **1-Applicant must have existing visa.**  **2-Applicant must provide valid visa number.** | | |
| **Post-conditions: The extension for visa will be done** **successfully**. | | |
| **Normal Scenario** | | |
| Actor Action | | System Response |
| **1-The Applicant provides his visa number.** | | **2- finds the visa information.** |
|  | | **3-Calculate the remaining duration for visa (see 3.a. in the alternative flow).** |
|  | | **4- asks to pay extension fee.** |
| **5- The Applicant pays the extension fee.** | |  |
| **6- The AccSys send the receipt to the system (see 5.a. in the alternative flow)** | | **7- update visa with new extension date.** |
|  | | **8- informs the applicant about new duration date.** |
| **Alternative flows:**  **3.a. If the user has more than one month duration date, the system will ask from user to apply later.**  **6.a. If the AccSys didn’t provide the receipt to the system, the system will reject the application.** | | |

**2.b)**

**Diagram

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**3.a)**

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| **Use case Id:** **UC003** | **Handle Family Visa** | |
| **Brief Description** | **The employee fills the online application with his family members details. The system checks for the visa duration plus asking for extension if it’s less than the required duration and check for income satisfactory and criminal record. Immigration officer approves the visa, and the employee is informed about it.** | |
| **Primary actors** | **Employee, immigration officer** | |
| **Trigger(s)** | **The applicant finishes the application form** | |
| **Preconditions:**   1. **Employee must have enough income** 2. **Family members must have a clean criminal record** | | |
| **Post-conditions: The visa is approved by immigration officer and the employee is informed about it.** | | |
| **Normal Scenario** | | |
| Actor Action | | System Response |
| **1. the employee asks for the application form.** | | **2. shows the form.** |
| **3. the employee insert his family member info (see 3.a. for alternative flow).** | | 4. **saves all info and** **finds the visa status of the employee**  **(See 4.a for alternative flow).** |
| **10. the immigration officer approves the visa.** | | **5. retrieves income information of the employee.** |
|  | | **6. computes the income of the employee**  **(See 6.a for alternative flow).** |
|  | | **7. gets the criminal record of the family from the police system.** |
|  | | **8.** **Extend this use case to “computes visa duration” if the criminal record is good.** |
|  | | **9. prepare the visa with the duration and give it a unique number.** |
|  | | **11.inform the employee about the application.** |
| **Alternative flows:**  **3.a. if any details are not provided, the system asks for it.**  **4.a. if the visa expires in less than 6 months, ask the employee to extend the visa and terminate the session.**  **6.a. if the income is not satisfactory, reject the application.** | | |

**3.b)**

**Chart, box and whisker chart

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**4.a)**

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| **Use case Id:** UC004 | Handle work visa | |
| **Brief Description** | The employer of the person applies for wok visa then the system checks the visa limitations, police report for this worker, then receives the financial report from AccSys. Finally, prepare the visa and approved by immigration officer. | |
| **Primary actors** | Employer, immigration officer. | |
| **Trigger(s)** | Employer provides information about the person | |
| **Preconditions:** The employer’s person visa should not exist. | | |
| **Post-conditions:** The visa is approved and made. | | |
| **Normal Scenario** | | |
| Actor Action | | System Response |
| 1- The employer provides needed information of the person | | 2- save all provided information. (See 2.a. in alternative flow). |
|  | | 3- call the employer System for copy of the person’s job offer confirmation and police report. |
| 4- The employer submits the police report and provide. | | 5- Check the job confirmation, police report (see 5.a. in alternative flow) |
|  | | 6- check the limitation of total number of visas (see 6.a. in the alternative flow). |
|  | | 10- Ask AccSys for financial report. |
|  | | 8- Extend this use case to “make a bill” if the financial report is not fine. |
|  | | 9- send the bill to AccSys. |
|  | | 10- **prepare** work visa number. |
|  | | 11- link data to the employer in the system. |
|  | | 12-ask immigration officer to approve the visa. |
| 13- The immigration officer approves the visa. (See 14.a. in the alternative flow). | | 14- increase total number of visas by one. |
|  | | 15- inform the employer about the status. |
| **Alternative flows:**  **2.a.** If there are any missing details, system asks to provide them.  **5.a.** If the employer System did not provide either job confirmation, police report or both, the application will be rejected.  **6.a.** If the limitation of total number of visas already reached the application will be rejected.  14.a. if the application didn’t approve from the Immigration officer, System rejects the application. | | |

**4.b)**

**Diagram, schematic

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**5.a)**

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| **Use case Id:** UC005 | **Handle tourist visa** | |
| **Brief Description** | **the tourist fills his details in the online application form. the system checks if there is no issue with previous application after it checks for criminal record and according to the tourist's nationality, it determines the duration and ask the tourist to proceed to payment. Lastly, the visa is approved by immigration officer and the tourist is informed about it.** | |
| **Primary actors** | **Tourist, police system, bank, immigration officer** | |
| **Trigger(s)** | **Tourist asks for online application form** | |
| **Preconditions:**   1. **Tourist must have a passport** 2. **Tourist must have a clean criminal record** | | |
| **Post-conditions:**  **Tourist’s visa is approved, and he is informed about it.** | | |
| **Normal Scenario** | | |
| Actor Action | | System Response |
| **1. the tourist asks for online application form** | | **2. displays the form to be filled** |
| **3. the tourist fill his/her details along with a photo and a copy of passport (see 3.a. for alternative flow)** | | **4. saves tourist’s info and go over the person’s previous application of visas** |
|  | | **5. finds the status of previous application (see 5.a. for alternative flow)** |
|  | | **6. gets the criminal record of the family from the police system.** |
|  | | **7. Extend this use case to “computes visa duration” if the criminal record is good.** |
|  | | **8. asks for credit card info** |
|  | | **9. sends the card info to the bank** |
| **10. the bank reply to the system with the payment status** | | **11. sets up the visa along with duration and specify a unique visa number (see 11.a. for alternative flow)** |
| **12. the immigration officer approves the visa (see 12.a. for alternative flow)** | | **13. informs the AccSys about the payment along with the visa number** |
|  | | **14. informs the tourist about the visa status.** |
| **Alternative flows:**  **3.a. if there is a missing info, the system asks for it**  **5.a. if the previous application has any issue, the system rejects it.**  **11.a. if the payment is not okay, the system rejects the application.**  **12.a. if the approval is not made, the system rejects the application.** | | |

**5.b)**

**Diagram

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* **class diagram**

**Diagram

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* **Explain briefly**

**In this system, there are 3 examples of an applicant: a tourist, an employer, and an employee. Each example of the applicant can apply for an application to get a visa. For the visa, there are 3 main types of visas, a tourist visa, a work visa, and a family visa. The immigration officer is the main approval actor for any visa. A report class collects any report issued by the system. Reports such as criminal records and overstay reports. The passport class checks for overstays and sends it to the report class to make an overstay report. Finally, the billing class is made by the employer when he finishes the process of applying for a visa.**