Non-functional requirements

Operational

|  |  |
| --- | --- |
| Type of Requirement | Description |
| Technical Environment Requirements | * System can be accessed by mainstream browsers, e.g. Chrome, IE, Firefox on PC or MAC * Whole office has an always-one network connection to the system or database * System provide a capability to support user ordering through smart phone with only HCI layer upgrading. |
| System Integration Requirements | * System needs to import user information through excel or another flat file. * System might integrate with SMS system which can delivery some important messages to the users. * System might need to integrate with HR system to achieve authority management. |
| Portability Requirements | * System needs to easily be transferred to major smartphone OS, e.g. android, iOS through the mobile app. |
| Maintainability Requirements | * System will fix bugs and release new version every three months. * System can be upgraded to support some sensors to record actual flight information with one-month advance notice. |

Performance

|  |  |
| --- | --- |
| Type of Requirement | Description |
| Speed Requirements | * Response time must be less than 2s through customer client; and less than 1s through intranet. (except advance analysis functions, e.g. reports) * Database must be updated in real-time, which means order is valid immediately. |
| Capacity Requirements | * Support maximum of 30-50 simultaneous users at peak user time (with plane number growth, the maximum access user will be increased accordingly.) |
| Availability and Reliability Requirements | * System require 24/7 on-line with 99% uptime performance expect schedule maintenance. * Schedule maintenance will be 2-3 times per year and less than 12 hours each time. |

Security

|  |  |
| --- | --- |
| Type of Requirement | Description |
| System Value Estimates | * A system outrage is estimated to cost $1000 per day, per plane * A complete loss of data is not acceptable. |
| Access Control Requirements | * Customer can only create order and update limited information of his own * System admin can update order and schedules of pilot or plane, or create basic information of pilots and planes. * System admin can create bill and invoice * Pilot can update his own information and create schedule |
| Encryption and the Authentication Requirements | * All users need user and password to login system * Data base is required separated user name and password to login for maintain purpose * The web connection between the different branches and server should be security. |
| Virus Control Requirements | * Network router is accountable to check viruses * App server and database server is installed anti-virus software |

Cultural and political

|  |  |
| --- | --- |
| Type of Requirement | Description |
| Customization Requirements | * Two languages support: English and Spanish |
| Legal Requirements | * Personal Information cannot be exported outside of company * Personal information cannot be divulged by oral or literal. |

Conversion Plan

The conversion plan depicts the strategies and the process of how HA Plane rental company converts from the manual system to the electronic system.

Conversion Strategy

Since there is not any legacy system, we adopt a strategy that implants the whole system in one of branch performing the pilot job and replace the manual work. But we still keep the manual process for backup purpose in case there are some critical problems that the pilot system cannot handle. Additionally, the pilot will be split to pilot A and pilot B. in pilot A, the requests of customer will be performed by the company employees, e.g. system admin. In pilot B, customer can login system by themselves and reserve a plane. We choose this strategy because it can keep risks in a controlled area as well as faster a group of training leaders which can delivery knowledge to other branches. The brief chart of conversion strategy please see blew:

Conversion Process

One week before pilot, all the hardware, software and data should be prepared. Except client PC, all the servers and database are located in the headquarter, the pilot branch accesses it through a security network.

Hardware conversion

Hardware vendor should delivery and install the application server, database server and security hardware one month in advance. And insure the network is workable between server and client in the branches and internet.

the necessary client hardware upgrade might be deployed after hardware evaluation. All the retired client PC will be replaced by new one month in advance. All the hardware is listed blew:

|  |  |  |  |
| --- | --- | --- | --- |
| Hardware Name | Numbers | Location | Install Date |
| Application Server | 1 | HQ | 20/12/2017 |
| DB Server | 1 | HQ | 30/12/2017 |
| Security firewall | 2 | HQ+Branch | 25/12/2017 |
| Network | 2 | HQ+Branch | 5/1/2018 |
| Client PC | 15 | Branch | 10/1/2018 |

Software conversion

After hardware prepared, Operation system, database and other required software need to be installed on server or clients a half month in advance. Also, the rental server application should be deployed on the application server.

|  |  |  |  |
| --- | --- | --- | --- |
| **Software Name** | **Number** | **Hardware** | **Install Date** |
| **Windows 10 server R2** | 2 | Application server  DB server | 1/1/2018 |
| **SQL Server 2017** | 1 | DB server | 1/1/2018 |
| **Anti-virus** | 15 | New client | 6/1/2018 |

Data Conversion

Since there is no legacy system before, only configuration data and basic profile data will be built on the system. The plan, instructor, employee and customer information would be created by importing from Excels into database through ETL. The historical rental transaction data will not be included in this stage.

|  |  |  |  |
| --- | --- | --- | --- |
| **Data** | **Source** | **Destination** | **Transfer Date** |
| **Plane profile & price** | Plane.xlsx | Plane related tables | 13/1/2018 |
| **Customer Profile** | Customer.xlsx | Customer related tables | 13/1/2018 |
| **Instructor profile** | Instructor.xlsx | Instructor related tables | 13/1/2018 |
| **Employee** | Employee.xlsx | Employee and organization | 14/1/2018 |
| **Authority** | Role.xlsx | Role | 14/1/2018 |

Backup & Recovery Plan

The data server performs backup job at night each day; the application server performs backup job at night every week or before launching new version of the system. If any irreparable critical error happens, the recovery action should be executed in a half hour.

Conversion Evaluation

After completing all tasks of conversion plan, there are several criteria to evaluation the result of hardware, software and data respectively.

|  |  |  |  |
| --- | --- | --- | --- |
| **Scope** | **Criteria** | **Completed** | **Issue** |
| **Hardware** | * all the server works correctly * the network connected with the designed speed * security firewall works correctly |  |  |
| **Software** | * all required software is installed properly as designed performance * database can be accessed through network |  |  |
| **Data conversion** | * all data imported properly |  |  |
| **Backup** | * complete backup and restore tests * run backup tasks correctly as scheduled |  |  |

change management plan

Change management is an essential part of deploying HA rental system, which helps our employees and managers adapt to the new system without undue stress. There are three major steps in change management.

Awareness

Before the project kick-off and in the life time of whole project, making people awareness is important which allows people adapt the new process or skills comfortably. The basic changes include:

|  |  |
| --- | --- |
| **Changes** | **Affected Role** |
| Manual process will be replaced by system, all the business processes will be handled in this new system | All employees  All customers |
| Operate rental order through browser | Call center employee  Customer  Front-site employee |
| Check the order price and detail on-line | Finance  Sales |
| Make schedule | Plane admin  Instructor |

The new system evolution is a persistent process. Any employee or customer can promote his change request to the change committee which will make the decision and feedback. The change committee includes: Vice president(sponsor), Project manager, IT, business department liaison, finance liaison, etc.

New SOP

According to the new system, a new coordinate SOP (HA Plane Rental System SOP) might be launched which is related to the awareness but more detail. For example, a call center employee should follow this SOP to answer costumer’s call for reservation and make the current operations to create(update) an order for this customer. Then send the successful reservation feedback to the customer. The possible sections in the new SOP are depicted as blew:

|  |  |
| --- | --- |
| **SOP Section** | **Responsible Person** |
| Customer Reservation | Font-site employee  Call center employee  System admin |
| Plane Schedule | Plane Admin |
| Instructor Schedule | Instructor |
| Change Request Management | All employees |
| Unite Price Change | System Admin |
| Order history export  Order detail export | Finance  Sales  System Admin |

Access Cost & Benefit

For the conversion stage and post-conversion stage, the new system brings significant benefit, as well as has some cost. The follow table descripts the cost and benefit possible occurring.

|  |  |
| --- | --- |
| **Cost** | **Benefit** |
| Learning curve | Increased efficiency and skills for employees |
| Training cost | Less unpleasant areas for frontline employees |
| Employee needs time to adapt | Easier to schedule plane and instructor for admin and instructor |
| Customer needs time to adapt | increased efficiency for support functions, e.g. finance, IT, supply chain |
| System maintenance cost | Possibility to purchase more planes for management level |
|  | Competitive advantages in the field of plane rental |
|  | Increased comfortable for customer |

Training

Classroom Training is adopted in the pilot period, then a computer-based Training will be extended to the whole company in the second period. The representatives in each department and maintenance team take response for the questions from the internal users.

Bonus

In the period of implementing new system, company will give bonus for the person or team who:

* most familiar with system, and to be an instructor of system in his department
* promote the most valuable suggestion
* the quickest team which complete the training process and use system with less errors

Pilot Evaluation

The whole pilot estimate takes 3 months, then it will be evaluated if the new system would be deployed into the whole company. The evaluation contents will be listed as blew:

|  |  |
| --- | --- |
| **Section** | **Measure criteria** |
| hardware | No significant problem, e.g. shut down, very slow  Running functionally by 7\*24 |
| Software | No conflicts between software.  Running functionally by 7\*24 |
| Data | No data missing or lost  Performance achieve target |
| Back up & restore | Back up performs functionally each day  Restore performs functionally in any given test |
| Employee feedback | No significant stuck in the business because of system  All the high-middle bug has been fixed |
| Sponsor feedback | Business has been improved by system  No more grand business change which leads to system changes |
| Customer feedback | Mostly comfortable the new rental system  Average more positive feedback in survey |
| Cost | Cost in the scope of plan |