SE 4352.001 Software Architecture

Final Term Project

Pig Farmer Automated Resort Software (PFARS)

By Alex Lundin, Geet Babaria, Justin Horak

Pig Farmers Automated Resort Software (PFARS) system is a fully integrable resort software system built to client specifications. PFARS limits the need for actual physical employees by introducing Artificial Intelligence into daily operations.

The PFARS based resort is an automated vacation hotspot that allows for clients to do as little as possible in their normal daily needs and tasks. This includes but is not limited to such things as preference control, in which customer prior to completing their check-in, set their temperature, music, and snack preferences. Additionally, upon completion a RFID card is sent to the customer with a set range of check-in to check-out times. This card can be reactivated for additional resort visits.

Each resort customer sets their initial preferences, followed by a PFARS request for permission to establish connection with social media sites to specify more preferences such as uploading pictures of family on to digital picture frames. At this point the check in is complete and the preferences are sent to the PFARS server.

Once, PFARS sends a request for check-in to the server, staff will be alerted, and the appropriate requested items are collected and set into the customers temporary domicile. PFARS based temporary domiciles, are based on a centralized resort server, in which the resort staff monitors.

Staff members are required to have security permissions based on job title which will limit access according to their clearance. Customers will also have special permissions based on their needs and additional service costs.

Each domicile is smart appliance ready and adaptable to additional hardware. The air conditioning, refrigerator, domicile door locks and security cameras will be minimal requirements for functionality when automating PFARS.

Optional customer functions are as follows: voice activated system control, scheduling and reminder system, and automated concierge service which is integrated into the PFARS customer permissions upon preference selection.

Automated concierge service will be connected to the local community which will allow for item delivery or reservation services for events and/or restaurants.

NOTE: Preferences can be changed at any time via PFARS resort app, and if selected can also be controlled through the voice activated system control.

Functional Requirements
- Administrative functions
    - Registration for:
        - Customer
        - Employee
        - Vendor
- Audit Tracking
    - Check-In Time
    - Check-Out Time
    - Inventory of items in domicile
- Authentication
    - RFID
        - Gate to community
        - Door to house
        - Activity centers
- Authorization levels
    - Classification of users
        - Customers
            - Level 1
            - Level 2
            - Level 3
        - Employee
            - Admin
            - User
        - Vendor
            - User
- Backup system
    - Parsed down version of full system
    - Only includes life critical functionality
- External Interfaces
    - Plugins to all external services
        - Food
        - Transport
- Historical Data
    - Customer choices
    - Customer preferences
- Legal or Regulatory Requirements
    - Camera monitoring
    - Privacy policy
    - Waiver signatures
- Reporting Requirements
    - History of customer choices
    - History of customer preferences
- Transaction corrections, adjustments and cancellations
    - Items ordered to domicile

Non-Functional Requirements

- Availability
    - o System should be available 24/7
    - o System should be unavailable for time customer is not checked in or not maintenance time.
    - o Customer will also have mobile system to control utilities when outside the house
- Capacity
    - o Able to service at least 20 smart homes
    - o Able to service at least 200 application
- Performance – for example Response Time, Throughput, Utilization, Static Volumetric
    - o Network Availability 100%
    - o Response time, Highest priority for customers, lowest priority for inhouse maintenance and records.
    - o RFID response time needs to be within 2 seconds
    - o Voice Recognition need to be configured in 1 min
    - o Voice recognition also acts as secondary key
    - o Easy to connect to most personal I.O.T. devices
- Recoverability
    - o System should be able to automatically recover vital security functions from backup in case of server failure.
- Reliability
    - o System should make multiple backup copies of itself, incase system fails.
    - o In case of failure switch to different server to be serviced
- Scalability
    - o Server should be able to accommodate up to 1000 devices
    - o Network should be able to accommodate traffic of all device or prioritize the traffic
    - o System should be compatible with most sensors in market
- Security
    - o Deny access to all personal data of customer.
    - o Only authorize users can access data.
    - o All data must be encrypted before stored to server
    - o All physical access points must be RFID authorized