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Research and Assumptions

Additions and Expansions

This section of this report will outline what has been added to and expanded upon from the case study (ActiveGo). The entities I have assumed to exist outside of the case study, and/or elected to include in the rich picture and event table are as follows:

* ActiveGo Management {1}
* ActiveGo System Developers {1}
* ActiveGo Customer Interactions {1}
* ActiveGo System {1}
* Equipment Packs {6}
* Storage Locations {6}
* Bank {2}
* Australian Taxation Office (ATO) {2}

I elected to separate the nebulous term "ActiveGo" into several different entities that serve different and specific purposes in my interpretation of this system (Management, System Developers, Customer Interactions and ActiveGo System). It is important to distinguish all these entities from one another, both for visual and logical clarity when explaining the potential structure and outlining the processes this system would perform.

The Management entity refers to an organizational entity that oversees and manages the work that System Developers and Customer Interactions perform, including System Developers maintaining and updating the hardware and software that the ActiveGo System runs on, and Customer Interactions' performance when dealing with customers of ActiveGo.

Equipment Packs and Storage Locations are included in a list of entities due to customers directly interacting with them (e.g., picking up an equipment pack from a specific storage location).

The Bank entity refers to a bank that both customers and the ActiveGo System interacts with to manage financial transactions (e.g., payment of a daily fee, storage of a customer's deposit".

I also elected to include the ATO as an external entity, making assuming that ActiveGo would be an Australian-based company and system. This system's transactions and business would not fall under any of the categories that make it exempt from GST, and as such all the system's transactions need to be forwarded to the ATO and pay a portion of each sale in GST.

Further Activities and Pursuits

Many of the assumptions I have made in the previous section of this report could be clarified and elaborated on if this case study was non-fictional. For instance, I could request comment from ActiveGo Management for clarification on the current makeup of the organization, their ideal structure, exactly what processes the system must perform, and whether the inclusion of the Bank and ATO entities are necessary in my models. Additionally, I could interview spokespersons for real-world companies that facilitate equipment rentals in their systems (not necessarily just exercise equipment), such as Bunnings, Kennards, or Thrifty.

Assumptions

Please refer to the page in the Table of Contents titled “List of Assumptions” for an exhaustive list of the assumptions I made and used when writing this report and the various diagrams and tables included in it. They will be labeled with curly braces (e.g., Assumption #1 would be {1}).

Graphical user interface, application, map

Description automatically generated

Rich Picture

ActiveGo Locations & Products Boundary

In this rich picture, I elected to distinguish Equipment Packs and Storage Locations from the rest of the ActiveGo Group entities. I decided that this distinction was important due to the nature of Equipment Packs being inanimate objects, alongside Storage Locations encompassing a physical location, rather than a person or system that performs a specific task. However, they are both entities owned and managed by ActiveGo as a company, so I decided to place ActiveGo Locations & Products inside ActiveGo Group & Departments. Additionally, I decided to make Equipment Packs a separate entity from Storage Locations in the rich picture to distinguish between when Customer Interactions needs to check the condition of the packs (which is best illustrated by having a direct relationship to Equipment Packs) and the location of the packs (which is best illustrated by having a direct relationship to Storage Locations).

System Vision

Problem Description

ActiveGo has proposed a replacement ICT system for its current pen-and-paper system. In its current state, ActiveGo relies entirely on employees to calculate all fees for their equipment hire, including deposits and late fees, in addition to managing and cataloguing the locations and states of each equipment pack owned by ActiveGo. This kind of system is inherently prone to human error and is much more time-intensive than implementing and using an ICT system.

System Capabilities

The proposed new system will automate the following processes:

* Payment calculation and facilitate transactions
* Store relevant customer payment information
* Maintain the current locations and states of equipment packs
* Store all required customer information
* Communicate relevant transaction metadata to banks for taxation purposes
* Hold and release deposits as necessary

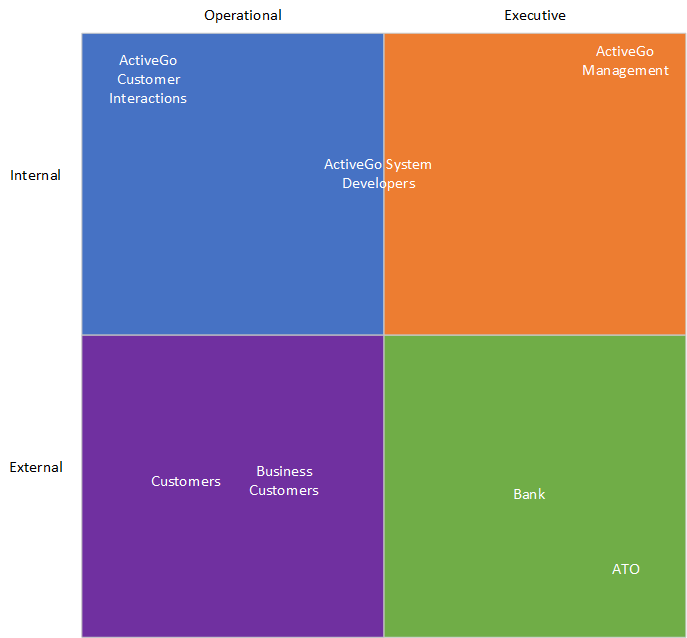
Business Benefits

In addition to saving time when serving customers by reducing the overhead workload on employees, the system could also significantly improve the reliability, security and availability of the data stored by ActiveGo, especially sensitive personal information of customers. If the system is implemented, it could also potentially improve the redundancy of data by running the system on a server with storage redundancy of some form. There may also be less of a requirement for the current number of employees fulfilling these processes if the system is implemented, thus lowering operating costs for ActiveGo.

Stakeholder Analysis

Stakeholder List and Relevance

* ActiveGo Customer Interactions {1}
  + Facilitates all interactions between customers and the ActiveGo System – crucial stakeholder that is vital to the function of the system
* ActiveGo Management {1}
  + Manages and organizes all internal operations between different ActiveGo stakeholders – important, but not entirely necessary for the implementation of the new system
* ActiveGo System Developers {1}
  + Vital stakeholder that will both design and maintain the system – imperative to the function of the system
* Customers/Business Customers
  + Important stakeholders that shape the requirements and functions of the system
* Bank {2}
  + Stakeholder that holds little-to-no power in the function of the system aside from the management of transactions
* ATO {2}
  + Stakeholder that is even less influential over the operation of the system than the Bank – exists in this model only to reflect a real-world application of the system



Customer Classification

I have elected to classify both "Customers" and "Business Customers" as Operational/External stakeholders, because they interact with the ActiveGo System through Customer Interactions, and with physical assets owned by ActiveGo (Equipment Packs). They do not directly interact with the system; thus, I have defined them as external stakeholders. They also do not have an executive influence over the operations or processes of the system, and as such I have elected to classify them as operational stakeholders instead of executive stakeholders.

ActiveGo Management Classification

I have elected to classify ActiveGo Management as an Executive/Internal stakeholder. This is because Management oversees and instructs all other departments of ActiveGo and controls the functions and processes of the ActiveGo System. They would not be best described as operational stakeholders due to Management not being directly involved with the technical and operational aspects of the roles that both System Developers and Customer Interactions fulfill.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Event Name** | **Type** | **Source** | **Condition** | **Trigger** | **Action** | **Response** | **Destination** | **Notes** |
| Submit Customer Information | External | Customers via Customer Interactions | Customer is not a business customer | Customer Interactions inputs customer information | 1. Store all input customer information on ActiveGo System | Data stored in system | ActiveGo System | Includes: First Name, Last Name, Postal Address, Email Address, Phone Number, Date of Birth |
| Submit Customer Information | External | Business Customers via Customer Interactions | Customer is a business customer | Customer Interactions inputs business customer information | 1. Store all input customer information on ActiveGo System | Data stored in system | ActiveGo System | Includes: Company Name, Postal Address, Email Address, Phone Number |
| Edit Customer Information | External | Customer Interactions | Customer is not a business customer | Customer Interactions edits customer information | 1. Store all new edited customer information on the ActiveGo System  2. Replace all previous customer information with current customer information | Display edit confirmation to Customer Interactions | ActiveGo System | Includes: First Name, Last Name, Postal Address, Email Address, Phone Number, Date of Birth |
| Edit Customer Information | External | Customer Interactions | Customer is a business customer | Customer Interactions edits business customer information | 1. Store all new edited customer information on the ActiveGo System  2. Replace all previous customer information with current customer information | Display edit confirmation to Customer Interactions | ActiveGo System | Includes: Company Name, Postal Address, Email Address, Phone Number |
| Submit Customer Hire | External | Customer Interactions | N/A | Customer Interactions enters customer's request for an equipment pack | 1. Store all input equipment hire information on the ActiveGo System | Data stored in system | ActiveGo System | Includes: Hire Date, Return Due Date, Pack Type, Pack Pickup Location, Pack Pickup Condition |
| Submit Customer Return | External | Customer Interactions | N/A | Customer Interactions enters conformation of equipment pack return | 1. Store all input equipment return information on the ActiveGo System | Data stored in system | ActiveGo System | Includes: Actual Return Date, Pack Type, Pack Drop-Off Location, Pack Return Condition |
| Calculate Customer Hire Cost | State | N/A | N/A | Event output (Submit Customer Hire) is submitted to the ActiveGo system | 1. Retrieve "Pack Type" parameter  2. Calculate daily fee in accordance with "Pack Type" parameter | Data stored in system | N/A | N/A |
| Calculate Customer Deposit | State | N/A | N/A | Event output (Submit Customer Hire) is submitted to the ActiveGo system | 1. Retrieve "Pack Type" parameter  2. Calculate deposit in accordance with "Pack Type" parameter | Data stored in system | N/A | N/A |
| Charge Customer Hire and Deposit | State | N/A | N/A | Event (Calculate Customer Deposit) is completed | 1. Retrieve value of events (Calculate Customer Hire Cost) and (Calculate Customer Deposit)  2. Send withdrawal request to Bank equal to total value of events | Withdrawal request sent to bank | N/A | Charges the customer when they have requested to hire an equipment pack |
| Check Customer Payment Status | State | N/A | Payment from customer is approved by Bank | Event (Charge Customer Hire and Deposit) is completed | 1. Send payment information to event (Hold Customer Deposit) | N/A | N/A | N/A |
| Check Customer Payment Status | State | N/A | Payment from customer is declined by Bank | Event (Charge Customer Hire and Deposit) is completed | 1. Display "Payment Declined" message  2. Prompt Customer Interactions to resolve payment issue with the Customer  3. Retry event or decline service | N/A | N/A | Catches the possibility of a declined payment |
| Hold Customer Deposit | State | N/A | N/A | Payment from Customer is received, and transaction value is equivalent to calculated value of event (Charge Customer Hire and Deposit) | 1. Store value of the event (Check Customer Payment Status) | Confirm bank has received funds, store value in the system | N/A | N/A |
| Withhold Customer Deposit | State | N/A | N/A | Event (Submit Customer Return) "Pack Return Condition" parameter is (Incomplete/Damaged) | 1. Do not initiate event (Release Customer Deposit) until Customer Interactions manually release the funds after the issue is resolved | Display deposit status to Customer Interactions | N/A | Used for withholding security deposits if a customer returns a pack in a damaged or incomplete state |
| Release Customer Deposit | State | N/A | N/A | Event (Submit Customer Return) "Pack Return Condition" parameter is (Complete/Undamaged) | 1. Refund value of event (Calculate Customer Deposit) if event (Submit Customer Return) is complete and event (Withhold Customer Deposit) is not triggered | Send fund transfer request to bank | N/A | N/A |
| Customer Equipment Hire Collection | External | Customer | N/A | Customer collects "Pack Type" from "Pack Pickup Location" | 1. Equipment Pack location is updated to "Currently on Hire" | N/A | ActiveGo System | This event is for specifically marking that a pack has been collected by a customer after they have paid their hire fee and deposit |
| Customer Equipment Hire Return | External | Customer | N/A | Customer returns "Pack Type" to "Pack Drop-Off Location" | 1. Equipment Pack location is updated to the value of "Pack Drop-Off Location" | N/A | ActiveGo System | Clearly marks the pack as being returned to a storage location |
| Combine Incomplete Packs | State | N/A | N/A | One or more of the same pack type is incomplete and can be combined to make one complete and undamaged pack | 1. Two Equipment Packs are combined if they both share the parameter "Incomplete/Damaged" 2. One Equipment Pack of the same kind is created and has the parameter "Complete/Undamaged" 3. The other "Incomplete/Damaged" Equipment Pack is deleted from the system | Merge Equipment Packs | Storage Location | N/A |
| Generate Pack Condition Report | Temporal | N/A | N/A | The day is a Friday | 1. Aggregate all most recent equipment state data 2. Generate and display a report | Report is generated and displayed to Management and Customer Interactions | ActiveGo System | N/A |
| Calculate Customer Late Fees | Temporal | N/A | N/A | Event (Submit Customer Hire) "Return Due Date" parameter is equal to the value of the parameter +1 day | 1. Store value of the event (Calculate Customer Hire Cost)  2. Multiply value by 1.5  3. Store multiplied value as "1 Day Late Fee" | N/A | N/A | N/A |
| Calculate Customer Late Fees | Temporal | N/A | N/A | Event (Calculate Customer Late Fees) was triggered exactly 1 day prior | 1. Retrieve "1 Day Late Fee"  2. Add value of "1 Day Late Fee" to itself, and store that total as "2 Days Late Fee" | N/A | N/A | N/A |
| Calculate Customer Late Fees | Temporal | N/A | N/A | Event (Calculate Customer Late Fees) was triggered exactly 2 days prior | 1. Retrieve "2 Days Late Fee" 2. Add value of "1 Day Late Fee" to "2 Days Late Fee" 3. Store new value as "3 Days Late Fee"  4. For all succeeding days, add the value calculated the previous day to the value of "1 Day Late Fee" and name the value "x Days Late Fee" | N/A | N/A | N/A |
| Charge Customer Late Fees | Temporal | N/A | N/A | Event (Submit Customer Return) "Actual Return Date" is the current date | 1. Retrieve most recently stored value of event (Calculate Customer Late Fees) 2. Charge customer the equivalent value | Withdrawal request sent to bank | N/A | N/A |
| Send Transaction Data to Bank | State | N/A | N/A | Event(s) [Charge Customer Hire and Deposit | Charge Customer Late Fees] is/are triggered | 1. Send transaction metadata to Bank | Send relevant transaction data to bank | N/A | This event enables the bank to send relevant transaction information to the ATO (see Rich Picture) |

List of Assumptions

1. ActiveGo is divided into Management, Customer Interactions, System Developers, and ActiveGo System
2. Bank and ATO are relevant and required for the system to function in the real world
3. Withheld deposits are all eventually refunded after customers resolve the condition the pack was returned in
4. Equipment packs are stored where they were last returned by a customer
5. Bank provides Point of Sale services for the ActiveGo System to handle customer transactions and deposits
6. Equipment packs and storage locations are entities

Reference List

[1] “Requirements Engineering: System Vision.” <http://birgit.penzenstadler.de/teach/590/2015spring_CECS-590_08-SystemVision.pptx.pdf> (accessed Sep. 01, 2021)

[2] “About Us.” <https://www.kennards.com.au/about-kennards-hire/>

(accessed Sep. 01, 2021).

[3] “Hire Shop.” <https://www.bunnings.com.au/products/hire-shop>

(accessed Sep. 03, 2021).

[4] “Vision document” Jun. 23, 2021. <https://prod.ibmdocs-production-dal-6099123ce774e592a519d7c33db8265e-0000.us-south.containers.appdomain.cloud/docs/en/elm/7.0.0?topic=requirements-vision-document> (accessed Sep. 01, 2021).

[5] J. W. Satzinger, “INTRODUCTION TO ESSENTIAL SYSTEMS ANALYSIS,” p. 13.

(accessed Sep. 01, 2021)

[6] “Modeling System Events.” <https://www.modernanalyst.com/Resources/Articles/tabid/115/ID/2932/Modeling-System-Events.aspx>

(accessed Sep. 04, 2021).

[7] “Stakeholder analysis.”

<https://www.pmi.org/learning/library/stakeholder-analysis-pivotal-practice-projects-8905> (accessed Sep. 03, 2021).

[8] “Stakeholder management.” Available: <https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/staff-development/public/impex/Stakeholder-management-21jun17.pdf>

(accessed Sep. 03, 2021)