Opportunity for Business Process Engineering: Inventory Management System

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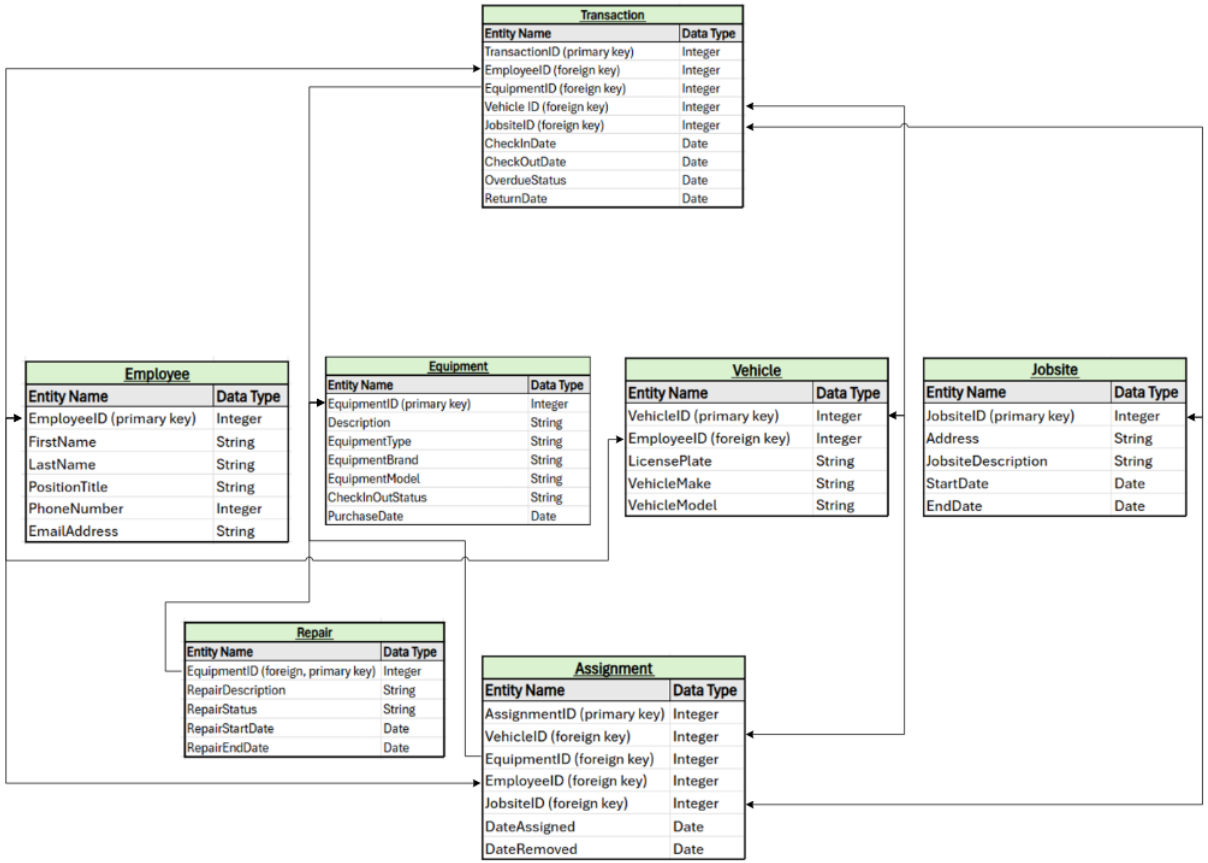
Project goals

- Research and identify inefficiencies in the inventory management process at my place of work
  - Landscape company managing small tools/equipment
  - Needing visibility on where items are (vehicle, crew, jobsite) and their physical condition (needing repairs?)
  - Currently utilizing hand-written paper inventory checks
- Design, test, and propose technical system solution to the business
  - Inventory management database
  - End user and administrator application

User Centered Development

- Design must be easy to use compared to paper time sheets
- Would like to implement the use of QR/barcode scanning and asset IDs to pull equipment information: check in/out status, repair status, location
- User accounts to pull user information: crew, vehicle, assigned jobsites
- Must meet the needs of relevant stakeholders like the management team, asset manager, shop/warehouse mechanics, procurement team, and scheduling team

Database design



Transaction

Entity Name	Data Type
TransactionID (primary key)	Integer
EmployeeID (foreign key)	Integer
EquipmentID (foreign key)	Integer
Vehicle ID (foreign key)	Integer
JobsiteID (foreign key)	Integer
CheckInDate	Date
CheckOutDate	Date
OverdueStatus	Date
ReturnDate	Date

Employee

Entity Name	Data Type
EmployeeID (primary key)	Integer
FirstName	String
LastName	String
PositionTitle	String
PhoneNumber	Integer
EmailAddress	String

Equipment

Entity Name	Data Type
EquipmentID (primary key)	Integer
Description	String
EquipmentType	String
EquipmentBrand	String
EquipmentModel	String
CheckInOutStatus	String
PurchaseDate	Date

Vehicle

Entity Name	Data Type
VehicleID (primary key)	Integer
EmployeeID (foreign key)	Integer
LicensePlate	String
VehicleMake	String
VehicleModel	String

Jobsite

Entity Name	Data Type
JobsiteID (primary key)	Integer
Address	String
JobsiteDescription	String
StartDate	Date
EndDate	Date

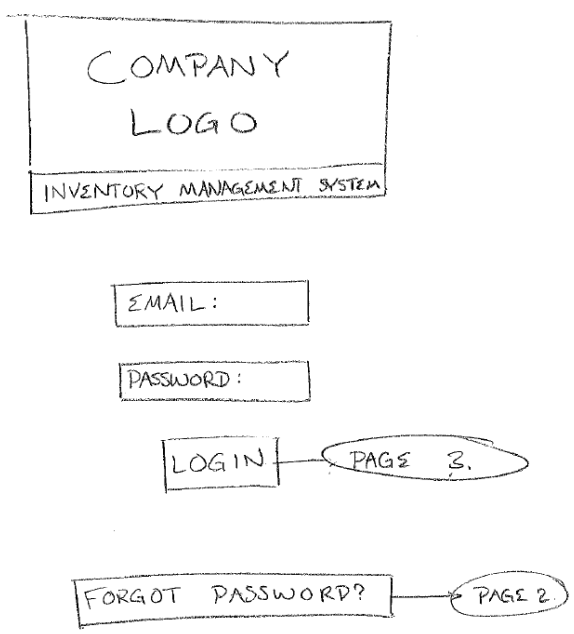
Repair

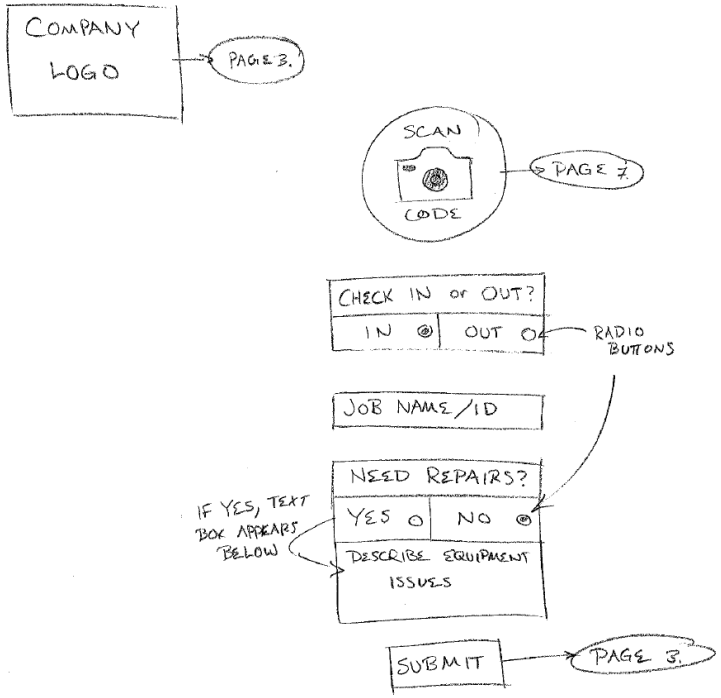
Entity Name	Data Type
EquipmentID (foreign, primary key)	Integer
RepairDescription	String
RepairStatus	String
RepairStartDate	Date
RepairEndDate	Date

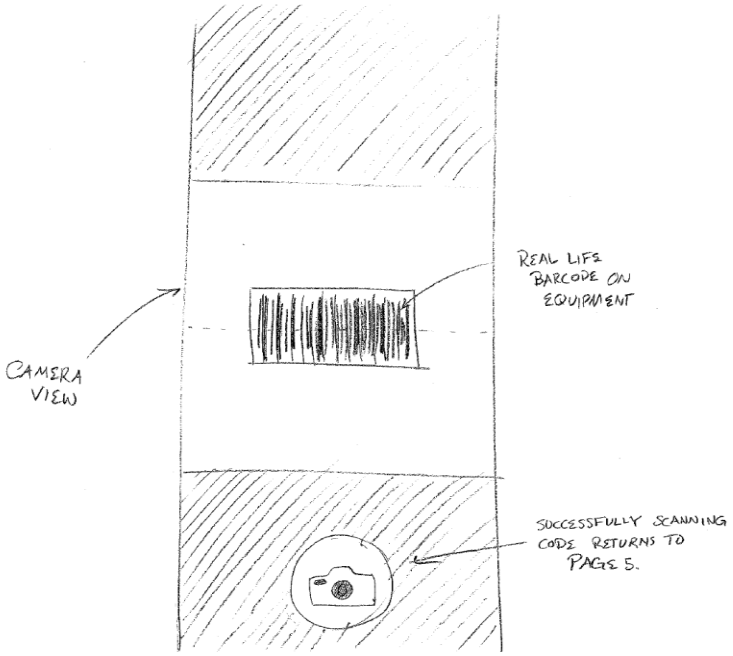
Assignment

Entity Name	Data Type
AssignmentID (primary key)	Integer
VehicleID (foreign key)	Integer
EquipmentID (foreign key)	Integer
EmployeeID (foreign key)	Integer
JobsiteID (foreign key)	Integer
DateAssigned	Date
DateRemoved	Date

Prototype One: Hand Drawn Wireframe



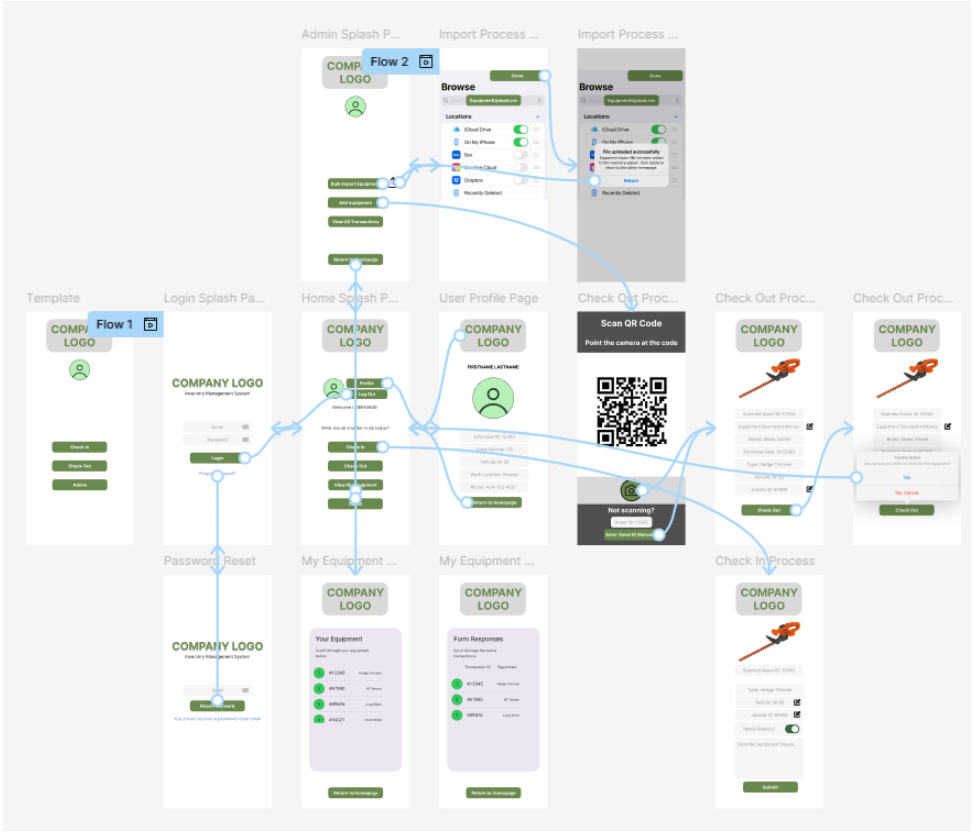


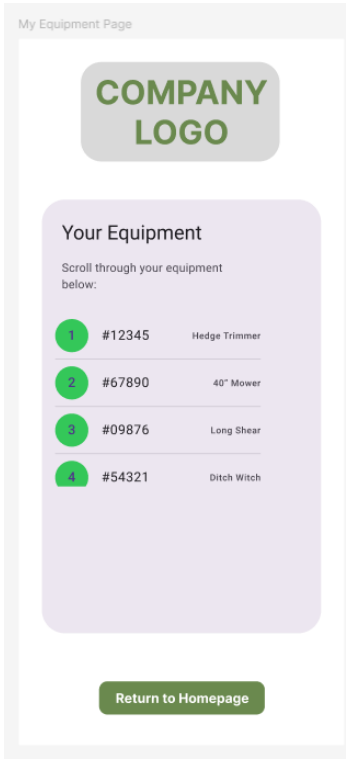


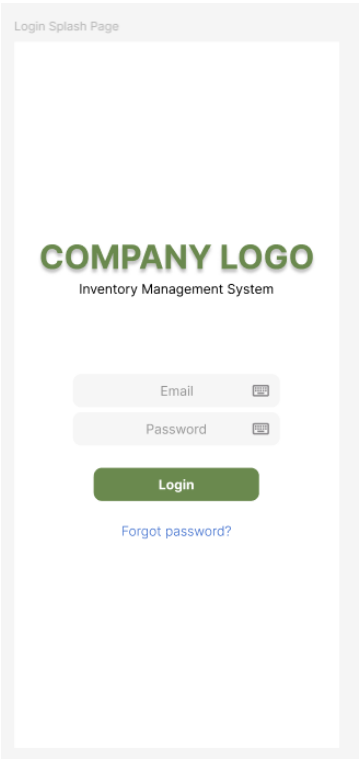
Prototype 1 User Testing Results

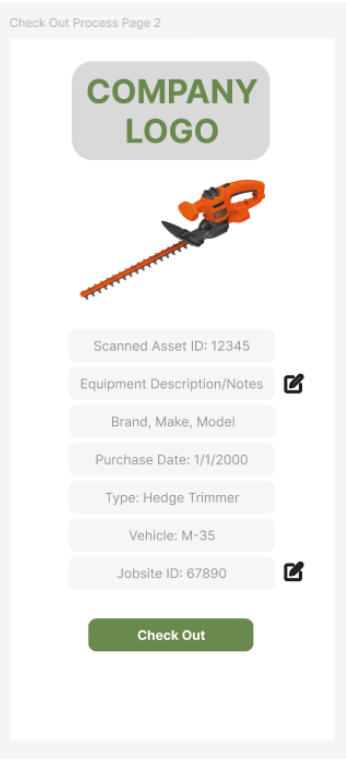
- Identified issues with usability/functionality
  - Too much cross over between end user and admin functionality
  - Redundant scanning during check in process; scanning only needed for check out
  - Still needing repair process flushed out
  - Not enough system status feedback to the user
- Otherwise, good reception to the concept, relevant users/stakeholders looking to see more

Prototype Two: Figma

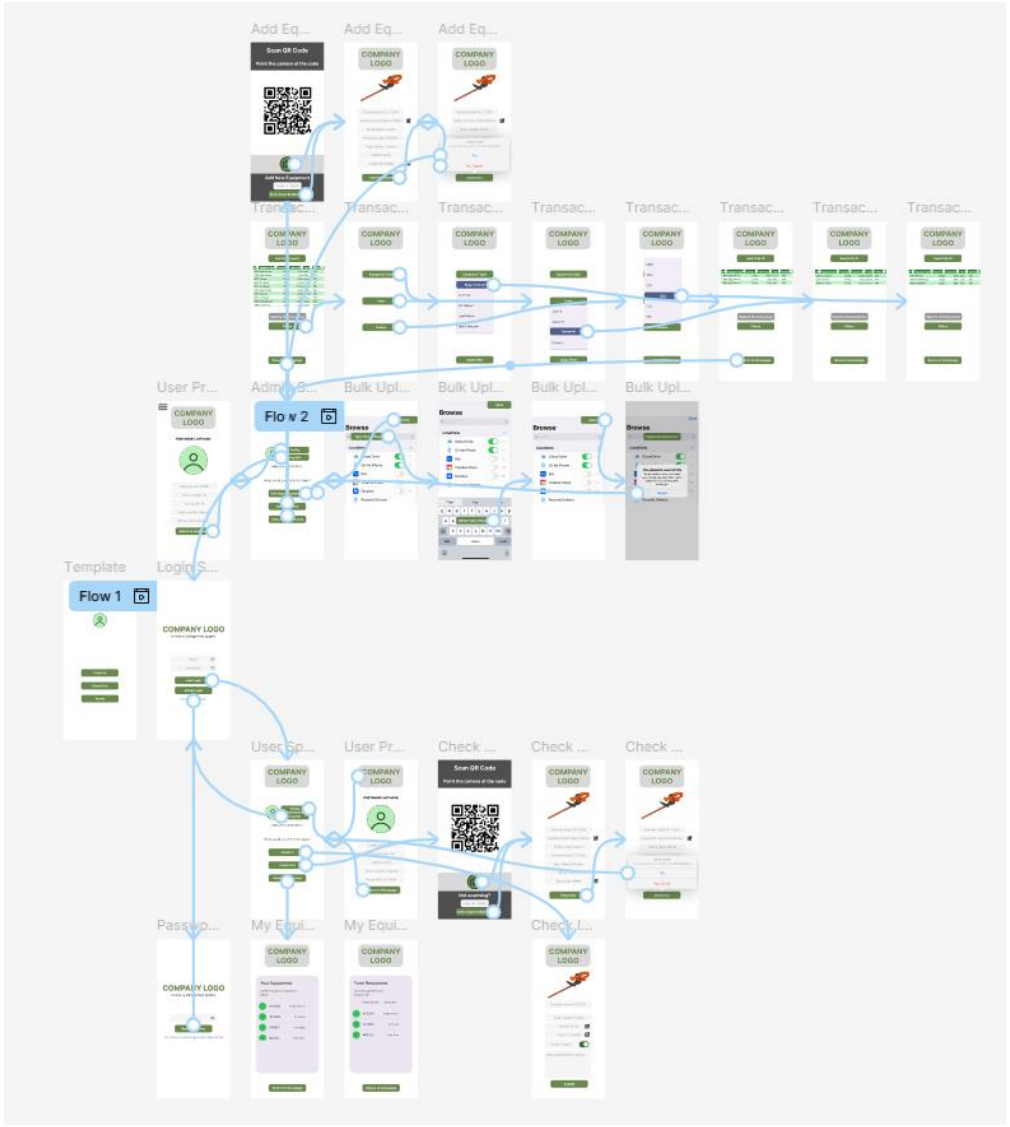


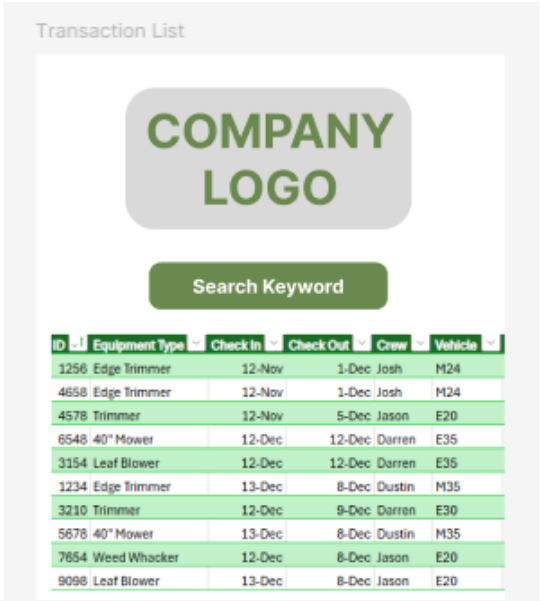


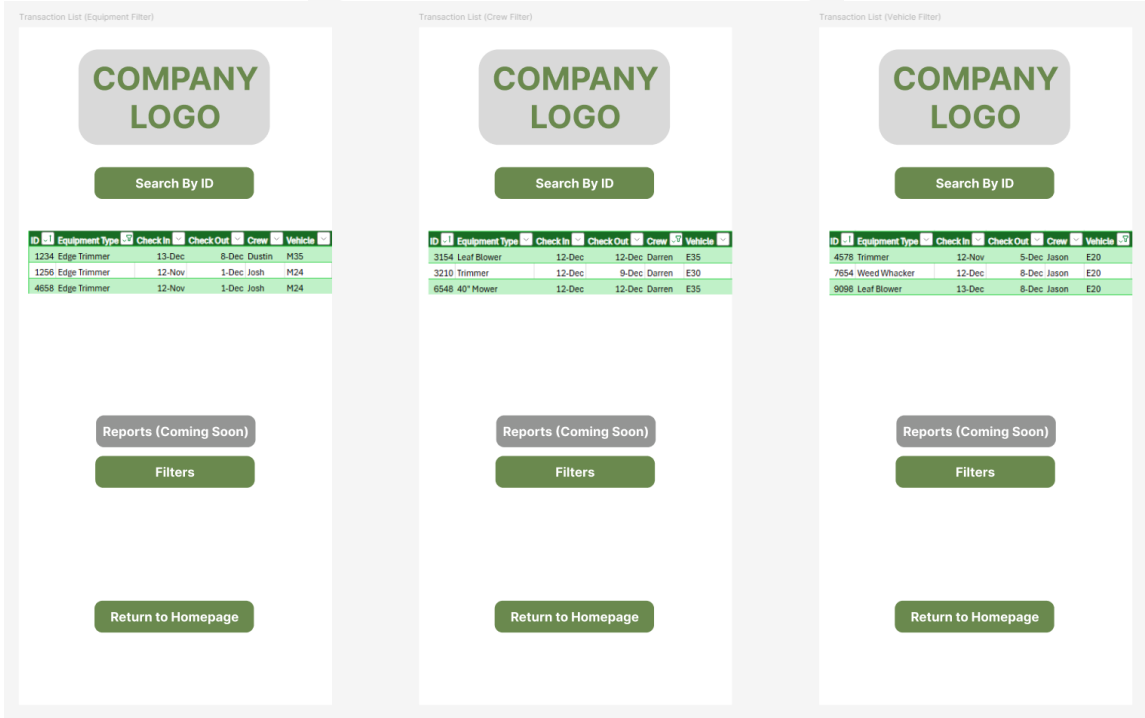




Final Prototype: Figma







Final Prototype testing results

- Much more usable than previously
  - Better user freedom and feedback from the system
- Higher ability to achieve identified user tasks
  - Filter the equipment list to find the location of an equipment
  - Admins able to upload one or multiple new equipment via a file upload
- Overall improvements, but still identified room for improvement
  - Repair process still lacking usability

Final Prototype goals

- Present to management at the company to see if they would consider embarking on development, implementation, training, and management of the system
- If so, continue developing
  - Inventory audit report
  - Equipment repair report
  - Financial budgeting report

Thank you!