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Alternatives Unlimited Inc. Property Service Application

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PROPERTY SERVICE APPLICATION

Final Report

Prepared for - MSIT 3999 Capstone

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Submitted by

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Table of content

CHAPTER 1 – INTRODUCTION.....	3
About the company.....	3
Project description.....	4
CHAPTER 2 – PROJECT MANAGEMENT APPROACH.....	7
Our approach	7
CHAPTER 3 – PROPERTY SERVICE APPLICATIONS IN THE MODERN MARKET	10
CHAPTER 4 – REQUIREMENTS	11
Previous solution - “Building Blocks application”	11
Requirements for new solution	12
CHAPTER 5 – RESEARCH	23
Hippo CMMS - Work Order Management	23
eQuest	25
Fleetmatics.....	27
Rentec Direct.....	28
PHA Web.....	31
MA CMMS.....	32
ProLease	34
CHAPTER 6 – ANALYSIS.....	37
Functionality fullness	37
Interface simplicity.....	38
Price conditions	39
CHAPTER 7 – RECOMMENDATIONS AND CONCLUSION.....	40
Recommendations	40
Conclusion.....	40
REFERENCES.....	42
APPENDIX A: APPROACH	43
A1: Base plan.....	43
A2: Trello	46
APPENDIX B: BUILDING BLOCK APPLICATION INTERFACE	48

APPENDIX C: SOFTWARE REVIEWS	52
C1: Hippo CMMS	52
C2: eQuest.....	61
C3: Fleetmatics	66
C4: Rentec Direct.....	75
C5: PHA Web	80
C6: MA CMMS.....	88
C7: ProLease.....	93
APPENDIX D: ANALYSIS.....	97
D1: Functionality fullness comparison	97
D2: Users Interface comparison	101

CHAPTER 1 – INTRODUCTION

About the company

Alternatives Unlimited Inc. was founded in Uxbridge and has expanded the network in rendering services throughout the Blackstone Valley as well as in Greater Worcester, Greater Milford, Fitchburg/Leominster, and Wrentham/Plainville areas. In its more than 35 years of presence, Alternatives has developed from a three-program organization serving only 26 individuals with 15 workers to a 55-program office with a \$39 million spending plan and a staff of more than 600 devoted experts serving around 2000 individuals. Their current trends involve in offering an unparalleled slate of administrations to several individuals with formative and/or psychiatric inabilities. The company is engaged in continuous efforts of retaining the core values of compassion and community involvement which includes people from all walks of life¹.

Mission

Alternatives Unlimited has always been about collaboration and not isolation. Alternatives is about sharing. Alternative Unlimited’s mission is to assist in fulfilling the desire for three basics that make life worth living: a real job, a real home, and real relationships.

Vision

The vision of the company can be described in their words: “As an agency that strives to enhance community connections for persons with disabilities, we believe it is our responsibility to be a bridge between those who need our services and the community at large. We recognize that strengthening community connections requires creating social ties, fostering frequent interaction between people from all walks of life and developing a sense of mutual obligation toward one another.”²

Core Values

The company provides the following services to the community³:

- Adult Family Care
- Developmental Disability Services:

¹ <http://www.alternativesnet.org/about-us/>

² <http://www.alternativesnet.org/about-us/community-mission/>

³ <http://www.alternativesnet.org/>

- Clinical Services
- Day Services
- Employment Services
- Residential Services
- Mental Health Services:
 - Clubhouse Services
 - Community-Based Flexible Supports (CBFS)
 - Outpatient Services

Project description

Objectives

The purpose of this project is to propose Property service application to be enforced for documenting and managing the work orders raised throughout the residencies. The company is looking into an application that would facilitate to track and monitor the maintenance request received in a systematic order and ensuring priority work request is resolved within the set timeframe. The project is to enhance the property service's work more efficiently as this will provide a high level of charge for the occupants by providing quicker response to their requests. The Objectives set to achieve for this project are realistic and would be met within the set time frame.

Project Outcomes

An effective functioning of online property service application to replace the manual entry of work orders with a regular backup of data. The application would automate the entire process of rendering service to the tenants of the premises.

Scope

1. In- scope:

An Approach to recommend a property service application so as to regulate the maintenance data and work orders for its resident premises. The property Manager and the maintenance staff can use daily to update and track the work orders, assigned a task, monitor the progress of work order, conduct data analysis.

The Project should include the following scope of work:

- defining, describing and prioritizing requirements;

- analysis of the property service application market;
- research for existing solutions and their comparison;
- recommendations to the company about the most relevant solution.

2. Out of scope:

- software development;
- employees training;
- implementation of the recommended application.

Risks

Negative Risk:

- the disparity of selected decision to all requirements;
- the lack of appropriate decisions is on the market;
- going beyond the scope of project budget;
- communication process with the client can be ineffective;
- disagreement in the project team.

Positive Risk:

- employee's working speed and efficiency will be increased;
- employee's mobility will be increased via an opportunity to use mobile devices.

Resources

Table 1 - Resources

Name	Role	Contact details
Jalpa Dave	Team member	jdave@clarku.edu
Nataliya Pennie	Team member	Nkulish@clarku.edu
Neelakshi Bali	Team member	Nbali@clarku.edu
Richard Cehon	Capstone professor	Rcehon@clarku.edu
Steven Piontkowski	Director of IT (Alternatives)	Steven.Piontkowski@alternativesnet.org
Moe DePalo	Property Manager (Alternatives)	Moe.Depalo@alternativesnet.org

Challenges

As in every project, even our Capstone project with Alternatives has a few challenges that our team faced:

- We couldn't organize our initial meeting for two weeks on account of the ineffective correspondence.
- Our project got changed by the client after being assigned the same. Our initial project was to manage the database and centralize it throughout the organization. But after about four weeks, we were informed that the client did not need help with the previous project of database management and provided us with a new project. This wasted our team's time and delayed our project by four weeks, and we are a little behind as compared to other teams. But we are handling it well as of now.
- Another important challenge to overcome is that of requirements of the client. The client was using an outdated property service application called Building Blocks and now wants to switch to another application which is similar to the Building Blocks in terms of functionality, except adding a few more requirements.

CHAPTER 2 – PROJECT MANAGEMENT APPROACH

Each project is unique and has personal specific; implemented approach should consider all project's specialties and project conditions.

Specialties and conditions of our project:

- type of project works – analytics and consultations;
- small team – only 5 persons (3 persons from the Capstone team; 2 persons from the client company);
- the short length of project – 2 months;
- all team members have different schedule – members are students with different classes;
- the client is located in a different city.

We've created our approach based on SCRUM methodology⁴, but we've taken only following principles:

- fixed-length iterations (sprints);
- fixed scope for sprint;
- the structure of sprint (partially).

Our approach

1. The central document is a Base Plan. The base plan includes all projects milestones. The base plan should be reviewed and actualized at least one time per mount.

*Our base plan was created after initial meeting with the client. This plan was changed in April because we approved new structure of the report and reviewed the necessary time for product review preparation (initial and changed versions of the base plan in **Appendix A1**).*

2. The length of iteration is 1 week. The scope of a sprint is defined during the spring planning meeting; the scope shouldn't be changed during the sprint; the scope should be in line with the base plan.

Structure of sprint:

- sprint planning - the main goal is to approve the plan for the following week;
- intermediate results - the main goals are to share the personal result with the team, and understand where the team is;
- sprint retrospective – the main goal is to summarize and analyze sprint results.

⁴ <https://www.atlassian.com/agile/scrum>

The scope of a sprint is a detailed plan. All task of the detailed plan should be created in issue tracking system; all task should have assigned; all task should be finished during the sprint.

Because of the size of the team, we decided to join sprint planning and sprint retrospective meetings, so we have 2 meeting per week:

- *on Monday at class (18:30 pm) – sprint retrospective and planning meeting;*
- *on Friday by Skype (10:00 am) – intermediate results meeting.*

As issue tracking system we've chosen "Trello"⁵ because it is a free, simple and web-based solution. This software is not powerful, but it allows users make all necessary basic functions:

- *create a simple workflow for tasks;*
- *create a task (assign responsible person and due date; write description and comments; add attachments);*
- *see backlog as a list or as a calendar;*
- *hide executed tasks;*
- *some other features.*

*Examples of our work with Trello in **Appendix A2**.*

For organizing effective work inside team we used following instruments:

Table 2 - Instruments

Instrument	Instrument's applying
Google Docs	Document sharing and collaboration.
Skype	Removal meetings with the team.
WatsApp	Instant information sharing.
Trello	Project management.

3. All meetings with the client are connected with milestones according to base plan. Each meeting should have a specific goal and bring a particular result. The result of the meeting can be the reason for reviewing the base plan.

⁵ <https://trello.com/>

During the project we had following meetings with client (all these meetings are connected with the second project. The first project was canceled by the client):

Table 3 - Meetings with the client

Date	Goal	Result
03.01.2016	Initial meeting with the Client.	Introductory information which is necessary for starting the project is obtained.
03.29.2016	Meeting with the client for approval of requirements.	All requirements are specified and approved.
04.12.2016	Meeting with the client for discussing intermediate results of searching.	Feedback about proposed solution and comparative metrics is received.
05.02.2016	Final presentation for the client	Project results are presented. Feedback from the client is received.

CHAPTER 3 – PROPERTY SERVICE APPLICATIONS IN THE MODERN MARKET

Property service application is a software used to automate the various types of operations and activity conducted on the premises related to maintenance management. The recent trend in the real estate industry is to inculcate and implement well define property management tool so as to yield productive results and sustain the market position.

There is a growing demand for high-tech property service software in the real estate business. This property service software facilitates to streamline the maintenance request and work order system. The cost competent investment in this type of technology tools benefits the entire property management team to handle the property maintenance tactfully. Thus, their prompt action also helps them to gain a goodwill point and generate higher revenue.

Property service application assists the maintenance administration team to perform well in delivering their duties including:

- manage emergency and non-emergency service calls per property and staff needs;
- automate dispatch to an emergency technician for faster tenant or resident response times;
- enter service requests into your property management system as they come in;
- monitor ticket volume, maintenance response times and trends;
- ensure appropriate customer care follow-up and closure of maintenance projects to build higher tenant and resident satisfaction rates, increase online positive social media feedback, tenant retention and result in a higher number of new prospects⁶.

⁶ <https://www.linkedin.com/pulse/top-tech-trends-2016-property-management-commercial-buildings-airst>

CHAPTER 4 – REQUIREMENTS

The previous solution - “Building Blocks application”

For previous 11 years, the property service of the company used the “Building Blocks application”. This program was developed by a local company which stopped exist four years ago. Consequently, last four years the application doesn’t have any support or ability to developing and modifying. This event became the main reason for searching for a new solution.

Functionality of “Building Blocks application”:

- Component, Buildings, and Program management;
- Assets management;
- Contact management;
- Work Order management, which includes following important opportunities:
 - an opportunity to assign a responsible person for the Work Order;
 - an opportunity to create tasks;
 - an opportunity to appoint status to Work Order;
 - an opportunity to commit results and spent time.

“Building Blocks application” advantages:

- the application had a user-friendly interface;
- the application was simple to use;

“Building Blocks application” disadvantages:

- the application worked too slow;
- this application allowed to commit the fact of executed work but didn’t allow to manage the whole process from creating the request to execute the work;
- all tasks connected with request’s combination, workers’ schedule, request’s efficient distribution were not automated; consequently, a manager had to do a lot of paperwork additionally to work with the application;
- reports weren’t able to be customized;
- the solution didn’t provide apps for mobile devices.

Example of “Building Blocks application” interface

(more examples in **Appendix B**)

The screenshot shows a software window titled "Work Orders Save as a NEW Work Order. (one time use)". The interface includes a menu bar with options like "Assets", "Tasks", "Labor", and "Actions". Below the menu is a form with several input fields: "# and Name" (with a placeholder "Type 'program name' here"), "Project", "Priority" (set to "Routine"), "Category" (set to "Repair"), "Request by", "Contact", "Customer", and "Notes" (with a placeholder "Type 'Brief description of the work done']"). To the right of the form are fields for "Status" (set to "Complete"), "Date of Status" (set to "1/28/2016"), and a "Type" dropdown menu. There are also radio buttons for "Selected" and "All", and buttons for "Issued", "Started", "Completed", and "Payable". At the bottom of the window is a table with the following columns: Component, Building, Program, Asset UID, #, Task, Status, \$Labor, \$Material, \$Total, \$Budget, and Variance. The table is currently empty. Hand-drawn red and yellow arrows with the text "Sign Here" are overlaid on the form, pointing to the "Project", "Category", "Request by", "Contact", "Customer", and "Notes" fields.

Picture 1 - Work order creation.

Requirements for new solution

On initial meeting with Alternatives we defined person who will be responsible for this project from the company and will be our main point-of-contact:

- Moe DePalo - Property/Maintenance Manager from property service department.

The requirements gathering process

1. We had a separate meeting with Moe. The goals of the meeting were receiving initial information about department work and clarify base functional and nonfunctional requirements for future solutions. On this meeting we received the following information:

- general information about work process;
- the functionality of a previous decision (Building Block Application);
- advantages and disadvantages of the previous decision;
- base functional and nonfunctional requirements for future solutions;
- information about a solution (PHA Web) which Moe is already considering as a potential variant.

2. Alternatives had one potential candidate for implementation - "PHA Web". This application had disadvantages but at first sight, it covered almost all use-cases of property service department. That's why we decided to take demo presentation of this solution.
3. Base on assembled requirements, our conversation with Moe, and demo presentation we created a list of requirements and user-stories and arranged next meeting with Moe.
4. The goals of the meeting were clarifying, approving and prioritizing the list of requirements and users-stories. As a result of this meeting we received approval list of requirements, we excluded unnecessary scenarios and added missing one.
5. We have decided that existing requirements specification is enough for achieving project goals and choosing an appropriate solution.

General information about departments works process

Table 4 - departments works process

Category	Description
Amount of users	11 users. Even if the department is expanded, a number of users won't exceed 20 people.
Amount of units	The company has a little bit more than 100 units, but definitely less than 200 units
Roles	Administrator, Manager, Worker
Characteristics of target audience	
Administrator	A person who is resolving technical and administrative issues connected with the application. He doesn't have a lot of time, and usually, he is not a high-quality specialist.
Manager	A person who manages requests and workers. He often spends more time working with people than working with computers programs. He has to keep in mind many different tasks simultaneously. He doesn't have any free time.
Worker	A person who directly performs works on the place (plumber, repairer, carpenter, etc.). He is not an advanced user of PC. He usually has to visit several different locations in one day.

New application's requirements

The new system should cover all functionality of "Building Blocks application" and meet additional requirements.

For defining the importance, we use qualitative system of measurement:

- High - a requirement is very important;
- Medium - a requirement is neutral;
- Low - a requirement is not important.

Table 5 - Functional requirement


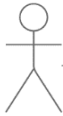

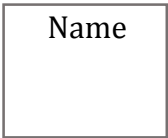
Functional requirement	Importance
The solution must provide mobile app for, at least, next user-stories: <ul style="list-style-type: none"> ● Manage inspections (all user-stories); ● Manage work orders (all user-stories); ● Manage worker's schedule; ● Inventory. 	High
The solution must provide an opportunity to attach photos to orders and inspections.	Medium
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	High
The solution must provide a sufficient list of reports or an opportunity to customize reports.	High
The solution must provide an opportunity to prioritize orders.	High
The solution must provide an opportunity to manage of worker's schedule.	Medium (nice to have)
The solution must allow group locations by components, buildings and apartments.	High

Table 6 - Nonfunctional requirement

Nonfunctional requirement	Importance
The application must work fast (The creation of order must take 30 sec or less)	High
The interface must be simple and suitable for daily using	High

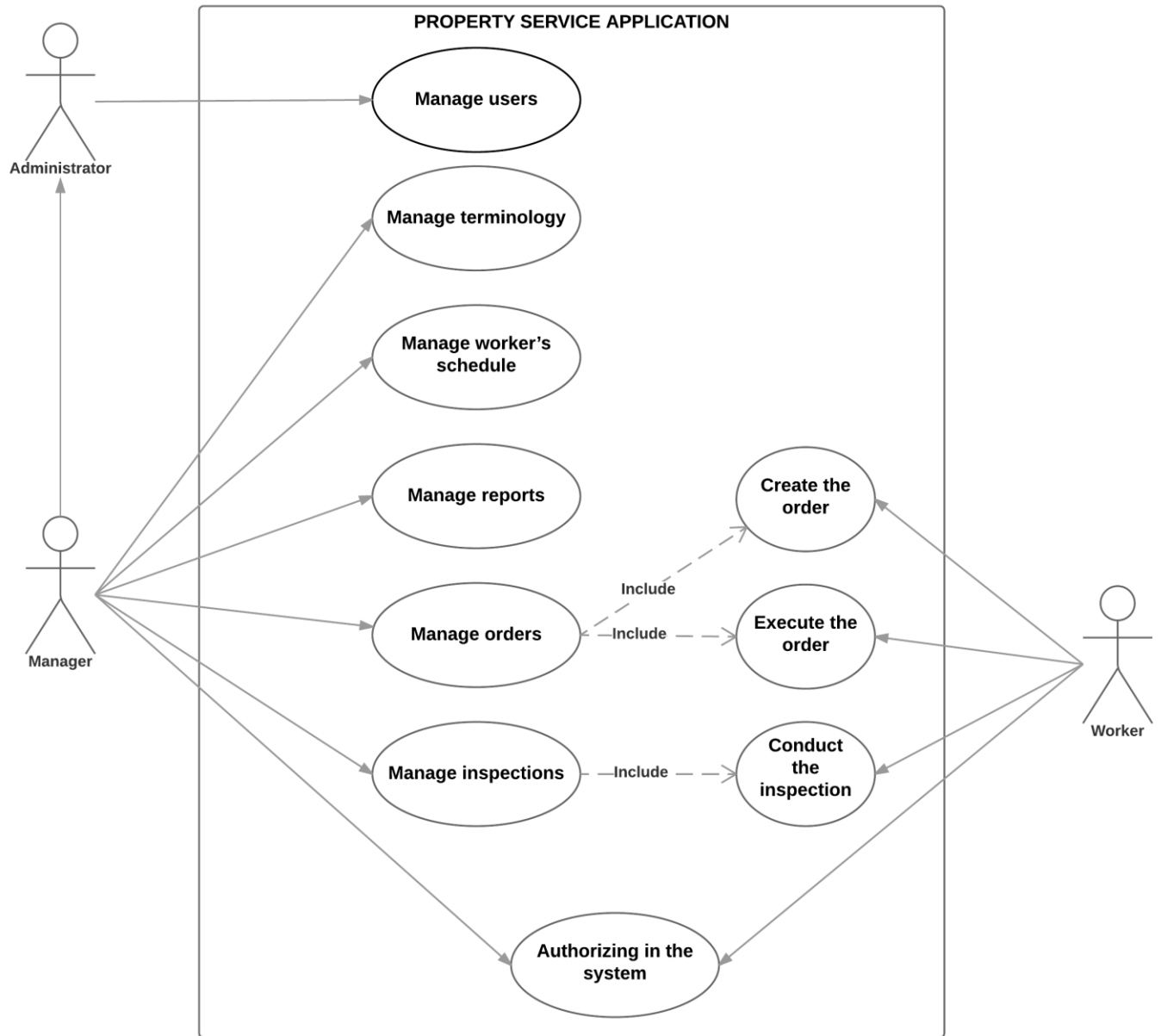
We have created use-case diagram for graphically showing required use-cases, roles, and the relationship between them. Use case diagrams depict⁷:

Table 7 - Use case diagrams depict

Image	Definition
	Use cases. A use case describes a sequence of actions that provide something of measurable value to an actor and is drawn as a horizontal ellipse.
	Actors. An actor is a person, organization, or external system that plays a role in one or more interactions with your system. Actors are drawn as stick figures.
	Associations. Associations between actors and use cases are indicated in use case diagrams by solid or dotted lines. An association exists whenever an actor is involved with an interaction described by a use case. Associations are modeled as lines connecting use cases and actors to one another, with an optional arrowhead on one end of the line. The arrowhead is often used to indicating the direction of the initial invocation of the relationship or to indicate the primary actor within the use case.
	System boundary boxes. It is a rectangle around the use cases, called the system boundary box, to indicates the scope of your system. Anything within the box represents functionality that is in scope and anything outside the box is not.

⁷ <http://www.agilemodeling.com/artifacts/useCaseDiagram.htm>

High-level use-case diagram



Picture 2 - Use-case diagram

Description to use-case diagram:

This is the list of user-stories that were showed in the diagram, but here we have entire and detailed one, including the level of importance of each user-story.

Table 8 - User-stories

User-story	Importance
<p><u>Authorizing in the system</u></p> <p><i>As a User, I want to authorize in the system using personal Login and Password to reach access to the system.</i></p>	High
<p><u>Manage users</u></p> <ul style="list-style-type: none"> ● Add new user <i>As an Administrator, I want to add new users for providing them access to the system.</i> ● Edit user's information <i>As an Administrator, I want to edit existing user's information for maintaining the actuality of their personal information.</i> ● Manage user's rights <i>As an Administrator, I want to manage user's permissions (create, read, open, edit, or delete different documents in the system) for dividing responsibilities.</i> ● Delete a user <i>As an Administrator, I want to delete users from the system for breaking their access to the system.</i> 	High
<p><u>Manage terminology</u></p> <ul style="list-style-type: none"> ● Add new item ● Edit item ● Delete item <p><i>As Manager, I want to add, edit and delete items value in terminologies for maintaining actuality of terminologies.</i></p>	High
<p><u>Manage inspections</u></p> <p><i>Inspection - the act of looking at unit or apartment closely in order to find problems.</i></p>	
<ul style="list-style-type: none"> ● Create the inspection <i>As Manager, I want to create a document which will be the reason</i> 	High

<i>for conducting inspections in one or several units or apartments for conducting an inspection in the future.</i>	
<ul style="list-style-type: none"> ○ Create multiple recurring inspections <i>As a Manager, I want to create repeatable inspection and set up its schedule for saving my time and conducting similar inspection according to schedule.</i> 	Medium
<ul style="list-style-type: none"> ○ Create single inspection <i>As a Manager, I want to create a single inspection for conducting a one-time inspection.</i> 	High
<ul style="list-style-type: none"> ● Edit the inspection <i>As a Manager, I want to edit existing inspections for making corrections.</i> 	High
<ul style="list-style-type: none"> ● Delete the inspection <i>As a Manager, I want to delete wrong and not relevant inspections for maintaining actuality of inspection schedule.</i> 	High
<ul style="list-style-type: none"> ● Planning/schedule inspections <i>As a Manager, I want to assign a date and responsible person for each inspection to provide conducting inspections on time.</i> 	High
<ul style="list-style-type: none"> ● Search the inspection <i>As a Manager or Worker, I want to find inspection in accordance with different criteria (assignee, date, status) for editing, deleting, planning, conducting or making re-inspection.</i> 	High
<ul style="list-style-type: none"> ● Conduct the inspection <i>As a Manager or Worker, I want to conduct the inspection and fill the protocol for committing detected problems or lack of them.</i> 	High
<ul style="list-style-type: none"> ● Re-inspection <i>As a Manager, I want to re-open a suspicious conducted inspection for conducting re-inspection and providing a high level of service for tenants.</i> 	Medium

Manage work orders	
<i>Work order - is a request to eliminate defects. A work order can include one or several tasks.</i>	
<ul style="list-style-type: none"> • Create the work order <i>As a Manager or Worker, I want to create a new work order for committing detected problems.</i> 	High
<ul style="list-style-type: none"> ○ Create single work order <i>As a Manager or Worker, I want to create a single work order for performing including tasks only one time.</i> 	High
<ul style="list-style-type: none"> ▪ Create the order by unit <i>As a Manager or Worker, I want to create a single work order for particular unit or apartment for committing detected problems in particular apartment or unit.</i> 	High
<ul style="list-style-type: none"> ▪ Create the order for multiple units <i>As a Manager or Worker, I want to create the same work order for several units or apartments by one operation for saving my time.</i> 	Medium
<ul style="list-style-type: none"> ○ Create recurring work order <i>As a Manager, I want to create a repeatable work order and set up its schedule for saving my time and performing similar work orders according to schedule.</i> 	Medium
<ul style="list-style-type: none"> ▪ Create the order for multiple units <i>As a Manager, I want to create a repeatable work order for several units or apartments by one operation, and set up its schedule for saving my time and performing similar work orders according to schedule.</i> 	Medium
<ul style="list-style-type: none"> • Edit the work order <i>As a Manager, I want to edit existing work order for making corrections.</i> 	High

<ul style="list-style-type: none"> • Assign the work order <i>As a Manager, I want to assign a date and responsible person for each work order to provide performing work orders on time.</i> 	High
<ul style="list-style-type: none"> • Complete the work order <i>As a Worker, I want to complete a work order and fill a report to commit the fact and results of performed work.</i> 	High
<ul style="list-style-type: none"> • Delete the work order <i>As a Manager, I want to delete wrong or not relevant uncompleted work order for maintaining actuality of work order's schedule.</i> 	High
<ul style="list-style-type: none"> • Verify of executed work order <i>As a Manager, I want to verify executed work order for monitoring the quality of performance.</i> 	High
<ul style="list-style-type: none"> • Search the work order <i>As a Manager or Worker, I want to find work order in accordance with different criteria (assignee, date, status) for editing, deleting, assigning, completing or verifying.</i> 	High
<p><u>Manage worker's schedule</u> <i>As a Manager, I want to set up a schedule of work for each Worker and Manager, including holidays, vacations, and sick leaves for seeing available resources.</i></p>	Medium
<u>Manage reports</u>	
<ul style="list-style-type: none"> • Configure report (Alternative is a sufficient list of reports) <i>As a Manager, I want to have the opportunity to build all necessary reports for making an effective analysis of department's work and providing reporting to authority.</i> 	High
<ul style="list-style-type: none"> • Build report <i>As a Manager, I want to see a report on my screen and download report at convenient for following processing format (Excel, Pdf) for making an effective analysis of department's work and providing reporting to authority.</i> 	High

<p><u>Manage assets</u></p> <ul style="list-style-type: none"> ● Add assets ● Search assets ● Edit assets ● Delete assets ● Transfer assets <p><i>As a Manager, I want to add, edit, delete, transfer between different units, and search assets which:</i></p> <ul style="list-style-type: none"> ● <i>available for our department to perform work orders;</i> ● <i>are located in tenant's units and apartments;</i> <p><i>for providing workers with necessary equipment, and providing residents with all necessary stuff.</i></p>	Low
<p><u>Inventory</u></p> <ul style="list-style-type: none"> ● Add inventory ● Search inventory ● Edit inventory ● Delete inventory <p><i>As a Manager, I want to manage (add, edit, delete, search) and conduct inventory for monitoring.</i></p>	Low

Requirements to main document “Order”

“Order” is the most important concept/document in a solution. This list of attributes describes necessity fields of this document and preferable type of each attribute.

Types:

- Automatic – a field is filled by the system automatically when a certain event has happened.
- Dropdown. There is a list of possible values of the field with an opportunity to choose one or several values.
- Calendar – calendar with an opportunity to choose particular date or date and time.
- Fill-in – blank field.
- Attachment

Table 9 - Document "Order"

Attribute	Type	Comment
General information:		
<ul style="list-style-type: none"> Status 	Automatic	Required
Information about creator:		
<ul style="list-style-type: none"> Username 	Automatic	Required
<ul style="list-style-type: none"> Date and time 	Automatic	Required
<ul style="list-style-type: none"> Maintenance request received (inspection, emails from programs, workers) 	Dropdown	Required
Information about location:		
<ul style="list-style-type: none"> Building name 	Dropdown	Required
<ul style="list-style-type: none"> Apartment's number 	Dropdown	Optional
Information about task:		
<ul style="list-style-type: none"> Due Date and Time 	Calendar	Required
<ul style="list-style-type: none"> Assignee 	Dropdown	Required
<ul style="list-style-type: none"> Category (heat / Air conditioning, plumbing, extermination, electricity, etc.) 	Dropdown	Required
<ul style="list-style-type: none"> Tasks 	Dropdown	Required
<ul style="list-style-type: none"> Priority 	Dropdown	Optional
<ul style="list-style-type: none"> Description 	Fill-in	Optional
<ul style="list-style-type: none"> Photos to be attached 	Attachment	Optional
<ul style="list-style-type: none"> Materials needed 	Fill-in	Optional
Additional fields		
<ul style="list-style-type: none"> Comments 	Fill-in	Optional

CHAPTER 5 – RESEARCH

The next move for the team was to direct the exploration process. The research of property service application ought to be in accordance with the customer's necessity. Subsequent to leading a significant amount of investigation of different applications, we were able to gather seven applications in the market that can be appropriate as per the client's specification. Each of this applications has a different scope, but the functionality remains the same. These property service applications offer cloud-based storage of data and facilitates as a SaaS solution.

The following is the list of applications that were considered:

- Hippo CMMS
- eQuest
- Fleetmatics
- Rentec Direct
- PHA Web
- MA CMMS
- ProLease

Hippo CMMS - Work Order Management

Website - <http://try.hippocmms.com/getapp/>



About the company

Hippo CMMS is a web-based maintenance software company based in Canada. With 90% client retention and unbeatable support they provide simplify solutions of maintenance management solutions. Hippo CMMS offers a wide variety of its products ranging to various industry customers which include health care, Nonprofit, Education Facility management, Manufacture, etc⁸.

General information about solution

It provides a fully integrated maintenance request portal that can be accessed by all staff and customers. Companies can add as many maintenance requesters into their database allowing them to submit maintenance requests when needed. Once requests are submitted, admin users are notified in real-time, review the request, approve (or reject) it, and create a work order which is assigned to a technician or outside vendor. This is a seamless

⁸ <http://www.hippocmms.com/about/team>

process, with the benefits of faster response time, accountability, and increased customer satisfaction⁹. (Requirements and user story in **Appendix C1**)

Mobile app

Hippo CMMS offers mobile application (screenshots in **Appendix C1**). Critical Functionality:

- Work order - yes
- Inspection - yes

Training

Hippo offers unlimited free training in the first 6 months of sign-up.

Data migration

There is a charge of service fee for data migration at a rate of \$150/hr.

Price and licensing policy

HipPro plan includes unlimited user licensing that starts at \$120/month.

The most suitable plan for Alternatives: HipPro STANDARD Dash:

- Unlimited Users / Unlimited Work Requesters;
- \$2,400 - \$3,000/year (Quote received from the Hippo Sales person for Alternatives);
- It includes:
 - Tech Support;
 - Software Upgrades;
 - Training.

Reports

The solution offers reports generation and can also be customized by the client itself at no cost.

Advantages

- Unlimited users and requesters
- Custom User Interface
- Customizable reports

⁹ <http://www.hippocmms.com/products/features-dashboards/work-order-management-software>

- Graphic interface.
- Reporting & analytics
- Unlimited free training in the first 6 months of sign up.
- Better decision making from real-time access to maintenance information.
- Reduced cost of labor and enhances productivity and improved scheduling.
- Faster responsiveness to work orders and critical events.
- Transparency
- Improved compliance and standard tracking and staff training.

Disadvantages

- The software does not possess any barcoding tool or voice recognition capabilities.

eQuest

Website: <http://www.equestsoftware.com/>



About the company

eQuest software is a cloud based work order and quality assurance application. The solution provides various functionality such as managing work orders, inspection, timesheets, reporting, etc.

General information about solution

eQuest software is a cloud based work order and quality assurance application. The solution provides next functionality: (User story and Requirements in **Appendix C2**)

- Work Orders;
- Inspections;
- Job Costing;
- Time & Attendance;
- Quotes;
- Scheduling & Alerts;
- Reporting;
- Time Sheets;
- QuickBooks Integration.

Mobile app

The solution provides web-version and mobile application¹⁰ (screenshots in **Appendix C2**).

Critical functionality:

- Work order – yes;
- Inspection – yes.

Training

Online training is included in the cost¹¹.

Data migration

It offers data migration into the new software.

Pricing and Licensing

For 11 users the cost will be \$440 per month + \$2500 set-up fee. Cost for the first year: \$7780 (Functions & services included in the cost in **Appendix C2**):

- The minimum monthly fee for eQuest is \$300 per month which includes 6 full access user licenses and unlimited FREE customer logins.
- After 6 users, the cost per user drops after your 10th user.
- There is one-time set-up fee.

Reports

The solution provides report designer and several charts.

Advantages

- the opportunity to create customs templates for inspection;
- convenient search for work orders with a lot of filters.

Disadvantages

- the application has the inappropriate speed of work (very slow);
- the application has a difficult interface;
- the application has a high price;
- there is no opportunity to plan inspections;
- there is no opportunity to create a work order from document “Inspection”.

¹⁰ <http://www.equestsoftware.com/features/>

¹¹ <http://www.equestsoftware.com/equest-pricing/>

Fleetmatics

Website: <https://www.fleetmatics.com/>



About the company

Fleetmatics WORK – SaaS solution for helping users in simplifying how they schedule and assign jobs, no matter how many times things change¹².

General information about solution

Fleetmatics WORK – SaaS solution for helping users in simplifying how they schedule and assign jobs, no matter how many times things change.

Two main concepts are “Job” and “Client”. The Job can have different types (work order, inspection, etc.), Client has units or apartments. “Job” can be created via any devices, once it was created, this information is available anywhere the user has internet access, whether it’s on a smartphone or on a computer back at the office (user story, requirement & additional features in **Appendix C3**).

Mobile app

The solution offers mobile application (detailed functionality of mobile app in **Appendix C3**). Critical functionality:

- Work order – yes;
- Inspection - yes (included in the work order).

Training

The company offers training for the product without any additional cost.

Data migration

Yes. There is an opportunity to migrate data from CSV-file.

Pricing & licensing policy

- Implementation fee - \$900 (The company is ready to exclude this fee for us).
- The Monthly cost per mobile user is \$40 for 10 or more and \$50 between 5-10.

¹² <https://www.fleetmatics.com/company-profile>

- No other hidden fees

For Alternatives (11 users):

- Implementation fee: **\$0**;
- Monthly cost: **\$440** (\$40 per user), but the company have made us offer \$385 (\$35 per user) if we make quick decision;
- Cost per year: **\$5280** or \$4620;
- We will be locked in at that price for next years;
- We will be able to add new users at that price;
- No capacity limitation.

Reports

The solution can Build Custom reports based on any field in the system including custom fields.

Advantages

- convenient and simple mobile application;
- the solution has dashboards;
- the solution allows managing working schedule.

Disadvantages

- the high cost of the solution;
- unusual concepts: Jobs and Clients, not Units, Work Orders, and Inspections.

Rentec Direct

Website: <https://www.rentecdirect.com/>



About the company

RENTEC DIRECT is a property management software for landlords and rental property management companies. Rentec Direct's objective is to make day-to-day property management tasks simpler. Founded in 2007 by Nathan Miller when he faced the challenge of property management himself. His motto for Rentec Direct is easy, powerful and affordable.

General information about solution

Rentec Direct offers property management solutions for a wide range of units from small to more than 1000 units. The dashboard provides notices of upcoming activities, pending decisions and deadlines. The notices come with direct links to other areas in the software to make it faster for the manager to work on the software¹³.

There are also icons available to mark certain work orders to act as visual reminders. There are icons of sticky notes besides the work order to show that a message has been posted on the work order. One can also add the icon which calls for “maintenance issues” or a “work order-in progress.”

There are also many filters available throughout the software which makes it easy to go around the software. The “Properties” tab on the top allows for easy filtration or narrowing down of the property and its units and creating work orders for the same¹⁴.

The “Tenants” tab on top serves mainly for managing the financial balances for the tenants, emailing the tenants, creating repair or maintenance requests, updating lease, uploading documents, etc. (Requirement & User stories in **Appendix C4**)

Mobile app

The solution does not offer a mobile app. However, the website is compatible with Android and iPhone. Critical Functionality:

- Work order - yes
- Inspection - yes

Training

There are many online demos available on Rentec Direct’s website which is of use for the training purpose. Also, the tech support is willing to give extra training online.

Data Migration

Available with the help of tech support.

¹³ <https://www.rentecdirect.com/>

¹⁴ https://www.rentecdirect.com/details/rentec_pm

Pricing & licensing policy

It offers a monthly service package and thus there are no term contracts. The pricing starts at \$155 per month for Rentec Pro and \$175 per month for Rentec PM¹⁵, for unlimited user accounts. The first month is free, as it comes as a 1-month free trial. There is no installation fee.

How many units do you manage?

Pricing	Rentec Pro learn more	Rentec PM learn more
200 Units	\$155/Month Plus your first month free! START MY FREE TRIAL	\$175/Month Plus your first month free! START MY FREE TRIAL

Picture 3 - Cost

For Alternatives “PRO tariff” is more suitable because “PM tariff” offers a lot more useless functionality.

Reports

Customized reports can be generated.

Advantages

- Allows for easy tracking of work orders and creating small messages throughout the software by using various icons available.
- Easy to use, available video demos and customer support 24*7.
- Compatible with Windows, Mac, Android, iPad and iPhone.
- The dashboard has a simple interface.

Disadvantages

- Offers more of financial dealing and recording and communications between the landlord and the tenant than plain work orders for maintenance and repairs.
- Involves a lot of not-needed tabs and functionality.

¹⁵ <https://www.rentecdirect.com/pricing>

- Might not function completely on the smartphone since there is no app.
- Does not allow for uploading of images/photographs.

PHA Web

Website: <http://www.pha-web.com>



About the company

Management Computer Services, Inc. is a privately held company that stands on a long tradition of providing superior software and software support, based in La Crosse, Wisconsin. The company is developing housing authority software and support services for more than 40 years.

Today the main product of the company is PHA-Web. The company decided to create PHA-Web in 2002 and began development in January 2003. In 2008 after 5 years of development PHA-Web was offered to the housing authority marketplace. As of 2013 over 240 housing authorities' utilize PHA-Web as their housing management software solution.

16

General information about solution

PHA-Web is a complex web-based management solution for managing all aspects of PHA operations. The solution was written using languages such as ASP.Net, JavaScript, and HTML. The relational database runs on Microsoft SQL Server 2008 Enterprise Edition (detailed information about the product, Requirement & User-stories in **Appendix C5**).

Mobile app

The solution does not offer a mobile application. Critical functionality:

- Work order – No;
- Inspection – Yes.

Training

The company provides training at a cost of \$600 (price includes online training up to 4 hours.)

¹⁶ <http://www.pha-web.com/home/ContentPages/companyInfo.aspx>

Data migration

The company is ready to download initial data from excel files at no additional cost.

Pricing & licensing policy

MCS uses an all-inclusive subscription fee pricing model for PHA-Web. The annual subscription fee is based upon the number of users required to access the PHA-Web software. For blocks “Work Orders” and “Inspections”. The annual subscription includes licensing fees, access to work order and inspection components and unlimited software support. The total PHA-Web Software Maintenance and Support Service fee for a one-year subscription is \$1200. (detailed price structure in **Appendix C5**)

Reports

The solution provides a sufficient list of reports. If the necessary report doesn't exist, the company is ready to create a new type of report or make a one-time query from the database.

Advantages

- There is flexible opportunity to manage user's roles;
- Big amount of reports.

Disadvantages

- There isn't mobile app for managing orders;
- There isn't convenient functionality for searching and managing existing work orders;
- The orders do not have workflow;
- There isn't functionality for manage worker's schedule.

MA CMMS

Website: <https://www.maintenanceassistant.com/>



About the company

Maintenance Assistant is a leading provider of cloud-based EAM (Enterprise Asset Management)/CMMS (Computerized Maintenance Management

System) solutions to businesses of all size all over the world and in 10 languages. Over 30,000 businesses and individual users worldwide have already experienced how Maintenance Assistant efficiently handles corrective, preventive, condition-based and scheduled maintenance for equipment and assets. It solves the challenges of securely capturing, accessing, sharing and backing up critical maintenance data and know-how. Maintenance Assistant CMMS is a full-featured maintenance management package that reduces the total cost of ownership of equipment assets and facilities and increases productivity through its simple and innovative tool-set. Our solution is portable and is available from any internet-enabled computing device – from desktops to tablets to smartphones. There is no provision of buying, installing or managing any expensive hardware. It requires a subscription and works in the web browser.¹⁷

General information about solution

MA CMMS computerized maintenance management software includes a huge array of features built around the highly effective work order system. The web-based system needs no setup and is updated automatically. Technicians will save roughly 3 hrs. a week by having instant access to old maintenance records. Mobile access and QR barcodes will also save the time that already overburdened maintenance teams spend on administrative tasks¹⁸ (Requirement, User story & key features in **Appendix C6**).

Mobile app

CMMS mobile app available for android and iPhone users.

Critical Functionality:

- Work order – yes;
- Inspection – yes.

Training

The company offers training at a cost ranging from \$395 - \$1100.

Data migration

It facilitates in importing maintenance data from CSV or Excel files.

¹⁷ <https://www.maintenanceassistant.com/about-us/our-history/>

¹⁸ <https://www.maintenanceassistant.com/cmms/features/>

Pricing & Licensing policy

The Company offers three packages which are as follows:

- Starter - It is a basic maintenance management software suitable for small business. Prices are quoted as \$19 user/month (billed annually or month to month).
- Professional - Its offers a complete maintenance management solution for any team size. Prices are quoted as \$29 user/month.
- Enterprise - Customizable and integrated maintenance and asset management solution. Prices are quoted as \$59 user per month.¹⁹

The best suitable package for Alternatives would be Enterprise which would cost around **\$7,788** (Exclusive of training & implementation cost)

Reports

The solution offers sufficient list of reports and also facilitates in customizing them.

Advantages

- The user dashboard has a simple interface.
- Customized reports can be generated.
- Accessible through web browser thus facilitating mobility.
- Regular backups of data.

Disadvantages

- High price as compares to market rates.
- Additional charge for every service rendered.

ProLease

Website: <http://proleasesoftware.com/>



About the company

ProLease has been a property management software in the market for more than 20 years now. Philosophy of ProLease is "It's not what you do, it's how you do it."²⁰ ProLease offers easy to use and understand interface with the ability to track even the minutest details and generate

¹⁹ <https://www.maintenanceassistant.com/cmms/pricing/>

reports out of the same. ProLease offers 3-4 product upgrades each year but even then the navigation is simple. The three primary objectives of ProLease have been to:²¹

- Design products that will help clients save time and reduce operating costs.
- Use cutting edge technology to offer solutions that are easy to use for all staff groups.
- Provide awesome support in all phases of our business.

General Information about solution

ProLease Real Estate and Facility Management is web-based software that offers a best-in-class solution for work orders and maintenance modules. The ProLease Maintenance module, often referred to as CMMS software, can streamline the process for managing work orders and preventative maintenance with a powerful workflow engine. This is achieved through the workflow engine which automates the work ticketing process by notifying all parties from initial work request through closeout. ProLease Project Management allows one to manage real estate projects such as site selections, renovations and more. One can track as little or as much detail as one likes, and easily be able to generate project summary reports. Since ProLease is web-based and priced for unlimited users, it is very easy to provide access for anyone in the company to submit work tickets. (Requirements & user story in **Appendix C7**)

Mobile app

Not available yet. A mobile website is not fully functional on iOS and Android.

Critical Functionality:

- Work Order
- Inspection

Training

Free training for the entire time of contract with the vendor.

Data Migration

Supports many formats for data migration. Supports migration from Excel, Access, HarborFlex, Virtual Premise, SLIM, SiteSeer, Strategen, REM, RetailLease and many other competitor databases.²²

²⁰ <http://proleassoftware.com/company/why-prolease/>

²¹ <http://proleassoftware.com/company/why-prolease/>

Pricing & licensing Policy

The pricing is a fixed amount for unlimited users a cost of \$4000 for 6 months

Reports

The solution facilitates in customizing reports.

Advantages

- The dashboard has a simple interface.
- Accessible through a web browser.
- Easy data migration from most of the formats in the market.
- Customer service 24*7.

Disadvantages

- High price.
- Not fully functional on smartphones.
- Does not allow for uploading of images/photographs.

²² <http://proleassoftware.com/services/data-migration/>

CHAPTER 6 – ANALYSIS

For making recommendation we decided to compare solutions by 3 characteristics:

- Functionality fullness;
- Interface simplicity; and
- Price conditions.

Based on the list of advantages and disadvantages of each solution, we exclude following applications, because they have critical disadvantages:

Table 10 - Unsuitable solutions

Solution	Reason for being unsuitable
eQuest	<ul style="list-style-type: none"> • the application has the inappropriate speed of work (very slow); • the application has a difficult interface; • there is no opportunity to plan inspections; • high price as compared to market rates (Cost for the first year: \$7780)
PHA web	The solution doesn't provide a mobile app for managing orders.
MA CMMS	high price as compared to market rates (Cost for the first year: \$8888) and additional charge for every service rendered.
ProLease	The solution doesn't provide a mobile app.

After exclusion there are 3 potential solutions for implementation:

- Hippo CMMS
- Fleetmatics
- Rentec Direct

All of them don't have critical disadvantages. But there is no perfect solution for the company because all solutions don't cover all functional requirements.

Functionality fullness

For functionality fullness comparison we've calculated the percentage of each solution functionality from required functionality and multiply results by coefficient which shows the importance of this functionality (Detailed description of calculating process in **Appendix D1**)

Table 11- Coefficients

Importance of functionality	Coefficient
High	3
Medium	2
Low	1

Table 12 - Functionality comparative table

Functionality	Imp.	Coef.	Hippo CMMS	Fleetmatics	Rentec Direct
Inspection management	High	3	0.92	0.92	0.92
Work order management	High	3	0.94	0.88	0.79
Worker's schedule management	Med	2	1	1	0
Data migration	Med	2	1	1	0
Reports	High	3	1	1	1
Mobile app functionality	High	3	1	0.78	0.67
Sum		16	15.58	14.73	10.12

According to results, "Hippo CMMS" has the most proper functionality and meets the requirements more than two other solutions, but the difference between "Hippo CMMS" and "Fleetmatics" is not critical. So, both solutions can be recommended for implementation.

Interface simplicity

We've compared Web application interfaces of Work order creation process, and Mobile application interfaces (detailed description in **Appendix D2**).

We use qualitative measurement scale: Very Difficult - Difficult - Normal - Simple - Very Simple.

Table 13 -Interface comparative table

Interface Simplicity	Hippo CMMS	Fleetmatics	Rentec Direct
Web browser	Simple	Normal	Normal
Mobile browser/app	Normal	Simple	Difficult
Final result	Normal	Normal	Difficult

Through interface's comparative table, we come to the conclusion that both Hippo CMMS and Fleetmatics are good options for daily work on the software by a number of users.

Price conditions

Table 14 - Price comparative table

Criteria	Hippo CMMS	Fleetmatics	Rentec Direct
Implementation fee	\$0	\$0	\$0
Fee per month	\$250	\$385	\$155
Others fee	\$150/hr. for data migration	\$0	\$0
Variable (opportunity that price can change)	Yes	No	Yes
Price for the first year	\$3450	\$4620	\$1705
Price for the second year Assumption: price will be stable	\$3000	\$4620	\$1860

Based on the price comparative table, Rentec Direct has the lowest price, and Fleetmatics has the highest one (more than 2 times higher than Rentec Direct). Hippo's price is in the middle.

CHAPTER 7 – RECOMMENDATIONS AND CONCLUSION

Recommendations

Final comparative table:

Table 15 - Final comparative table

Criteria	Hippo CMMS	Fleetmatics	Rentec Direct
Functionality	15.58	14.73	10.12
Interface simplicity	Normal	Normal	Difficult
Price for two years	\$6450	\$9240	\$3565

How we can see, Rentec Direct has very available price, but it has poor functionality and difficult interface. Functionality and interface are critical requirements, because of that we do not recommend Rentec Direct for implementation.

According to results, Hippo CMMS has the best correlation between price and quality.

But because of price is not a critical requirement, we would like to recommend Hippo CMMS and Fleetmatics as the property management software to Alternatives. Hippo CMMS and Fleetmatics are the best solutions amongst the seven different software that we researched Hippo CMMS and Fleetmatics come with a mobile app and fulfills all of the basic and important requirements like those of creation of work orders, maintenance requests, customized user reports, worker's schedule management, data migration amongst many others. Both of these options might not be the cheapest options but provide full functionality in terms of what is required by the Alternatives.

We would thus like to recommend not just one but two property management software as we believe that we should give Alternatives a choice to decide as they are the final decision makers.

- Contact for Fleetmatics - Ryan Schulz (Ryan.Schulz@fleetmatics.com)
- Contact for Hippo CMMS - Jorel Minuk (jorel@hippocmms.com)

Conclusion

After spending 10-weeks on this capstone project of researching to recommend a property management software to Alternatives, we have finally come to the conclusion and have a recommendation for the management team of Alternatives. We researched seven different

property management software, but four of them - eQuest, PHA Web, MA CMMS and ProLease did not come to fulfill the requirements provided by the Alternatives' management team. So, we focused all our efforts on the remaining three software - Hippo CMMS, Fleetmatics, and Rentec Direct and dug deeper in the research. After analyzing these three property management applications, we compared them on the basis of requirements fulfilled by each, interface simplicity and price and came out with two recommendations - Hippo CMMS and Fleetmatics.

We believe that both Hippo CMMS or Fleetmatics would be a good fit for the Alternatives.

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APPENDIX A: APPROACH

A1: Base plan

Initial base plan

The base plan is started from 03.01.2016 because the project was changed by the client.

 – milestones that were achieved

Table A1.1 - initial base plan

	Milestone Description	Deadline	Results/Expected results
1	Initial meeting with the Client (for new project)	03.01.2016	Introductory information which is necessary for starting project is obtained
2	Preparation of assignments 2-5	03.21.2016	Assignments 2-5 are ready and sent to advisor
3	Preparation of Chapter Three - Requirements	03.28.2016	Draft of Chapter three is ready
4	Meeting with the client for approval of requirements	04.04.2016	All requirements are approved
5	Preparation of Chapter Two – Trends of Industry	04.04.2016	Draft of Chapter Two is ready
6	Meeting with the client for discussing selected decisions	04.11.2016	Feedback from the client is received. Necessary corrections in Chapters Two and Three are done. Chapters Two and Three are ready.
7	Preparation of Chapter One - Introduction	04.11.2016	Chapter One is ready
8	Project Plan Monthly Report (assignment 4)	04.11.2016	Assignment is ready and sent to advisor
9	Preparation of Chapter four – Results and Recommendations	04.18.2016	Chapter Four is ready

10	Preparation of conclusion, initial page and formatting of report	04.25.2016	Full final report is ready
11	2nd Self-Evaluation assignment and Peer Evaluation (assignment 6)	04.25.2016	Assignments are ready and sent to advisor
12	Capstone Defense Presentation	05.02.2016	Formal presentation is ready and successfully defended
13	Self-Reflection on the Capstone Experience (assignment 9)	05.02.2016	Assignment is ready and sent to advisor

The base plan was reviewed after “Meeting with the client for approval of requirements” (number 6).

The base plan v.2

 – milestones that were achieved in time;


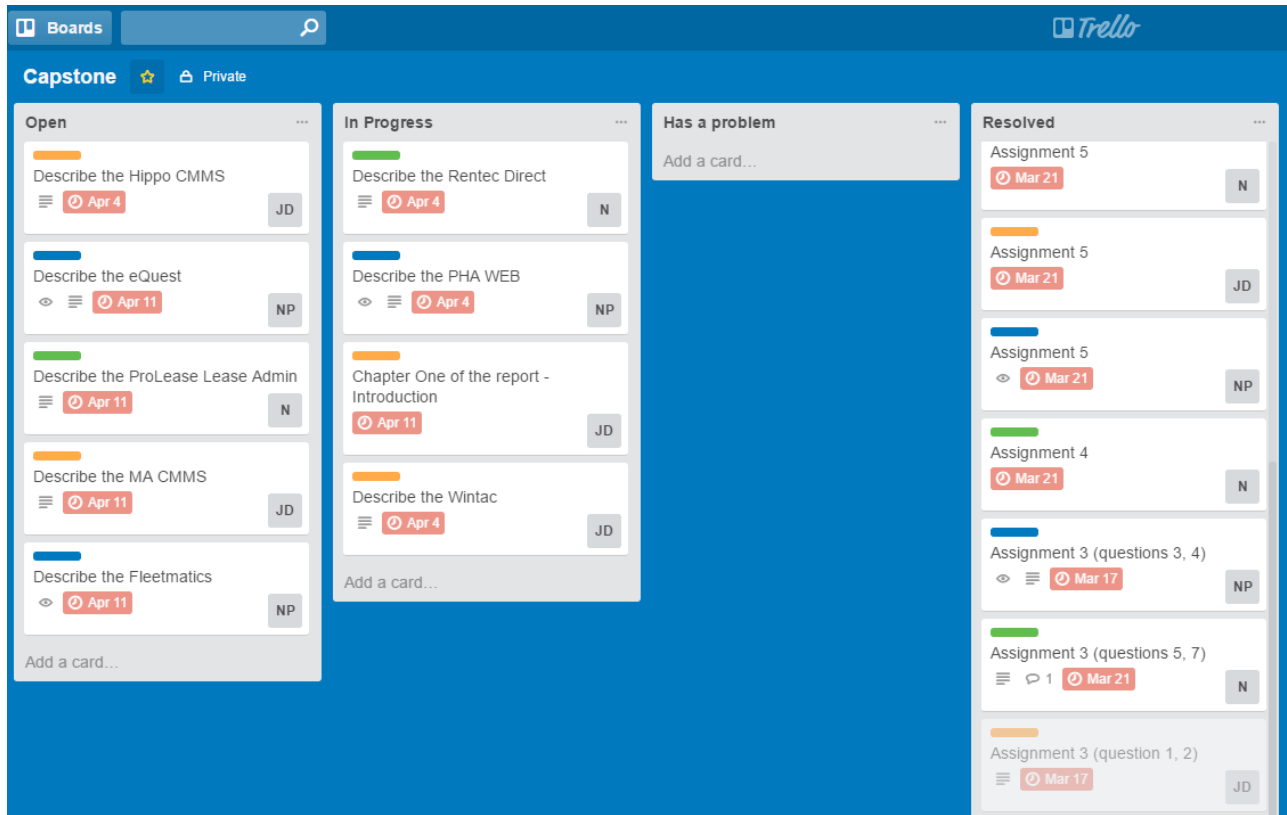
 – milestones that were achieved with delay.

Table A1.2 - second version of base plan

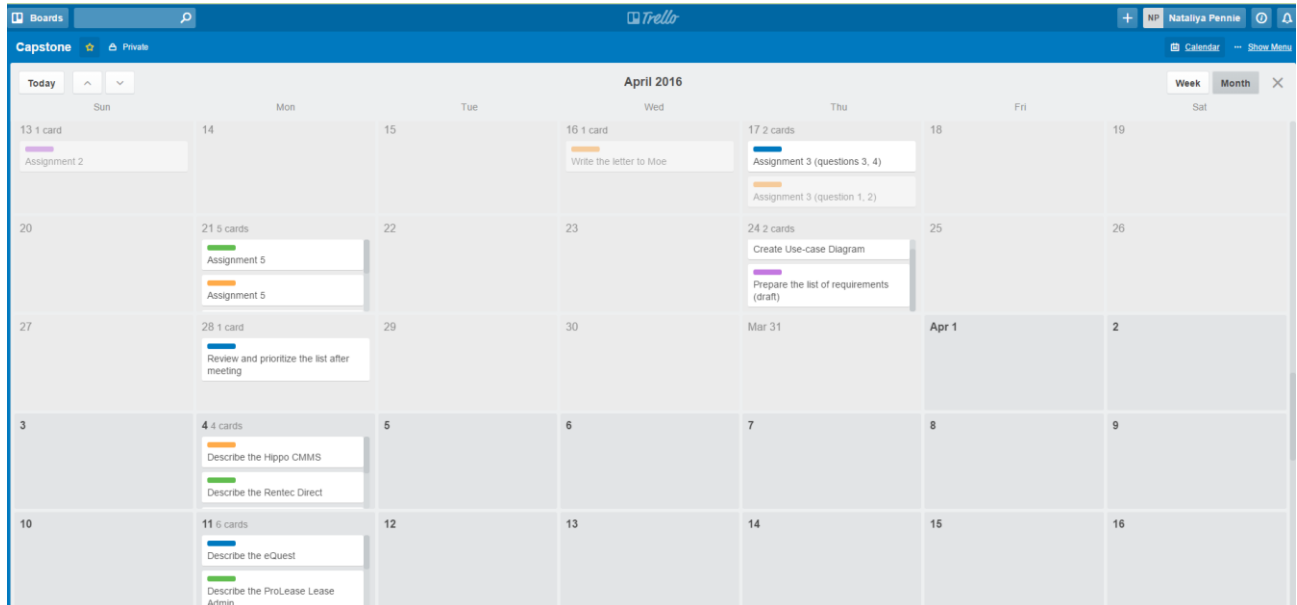
	Milestone Description	Deadline	Results/Expected results
Previous events are not included			
5	Preparation of List of potential products for analysis	04.04.2016	The List of potential products is ready, and responsible person for each product is assigned
6	Preparation of product’s reviews according to list of requirements	04.11.2016	Reviews are ready
7	Preparation of Chapter One of the report - Introduction	04.11.2016	Chapter One is ready for discussion with the team
8	Preparation of Chapter Three of the report – Requirements (final version for report)	04.11.2016	Chapter Three is ready for discussion with the team

9	Meeting with the client for discussing selected product	04.18.2016	Feedback about proposed solution and comparative metrics is received.
10	Preparation of Chapter Two of the report - Approach	04.18.2016	Chapter Two is ready for discussion with the team
11	Preparation of Chapter Four of the report – Research (based on product’s reviews)	04.18.2016	Chapter Four is ready for discussion with the team
12	Preparation of Chapter Five – Results and Recommendations	04.18.2016	Chapter Five is ready for discussion with the team
13	Preparation of conclusion, initial page and formatting of report	04.25.2016	Full final report is ready
14	Preparation of presentation	04.25.2016	The presentation is ready for discussion with the team
16	2nd Self-Evaluation assignment and Peer Evaluation (assignment 6)	04.25.2016	Assignments are ready and sent to advisor
17	Capstone Defense Presentation	05.02.2016	Formal presentation is ready and successfully defended
18	Self-Reflection on the Capstone Experience (assignment 9)	05.02.2016	Assignment is ready and sent to advisor

A2: Trello



Picture A2.1 – work dashboard



Picture A2.2 – Calendar

Write the letter to Moe

in list [Resolved](#)

Members: JD + Labels: + Due Date: Mar 16 at 12:00 PM (past due)

Last Updated: Mar 22 at 2:27 PM

Description [Edit](#)

- clarify questions for assignment 2
https://docs.google.com/document/d/1VDOvTpBbl51b_gyjCMiQ17B0MeRCeDC_Rh_CE6W5EXQ/edit#
- Ask about our meeting with "demo-man"

Add Comment

NP Write a comment... 🔗 @ 😊 📎

Activity

- JD **Jalpa Dave** moved this card from Open to Resolved Mar 15 at 6:23 PM
- NP **Nataliya Pennie** set this card to be due Mar 16 at 12:00 PM Mar 14 at 7:29 PM
- NP **Nataliya Pennie** added **Jalpa Dave** to this card Mar 14 at 7:28 PM
- NP **Nataliya Pennie** added this card to Open Mar 14 at 7:28 PM

Add

-
-
- Checklist
-
-

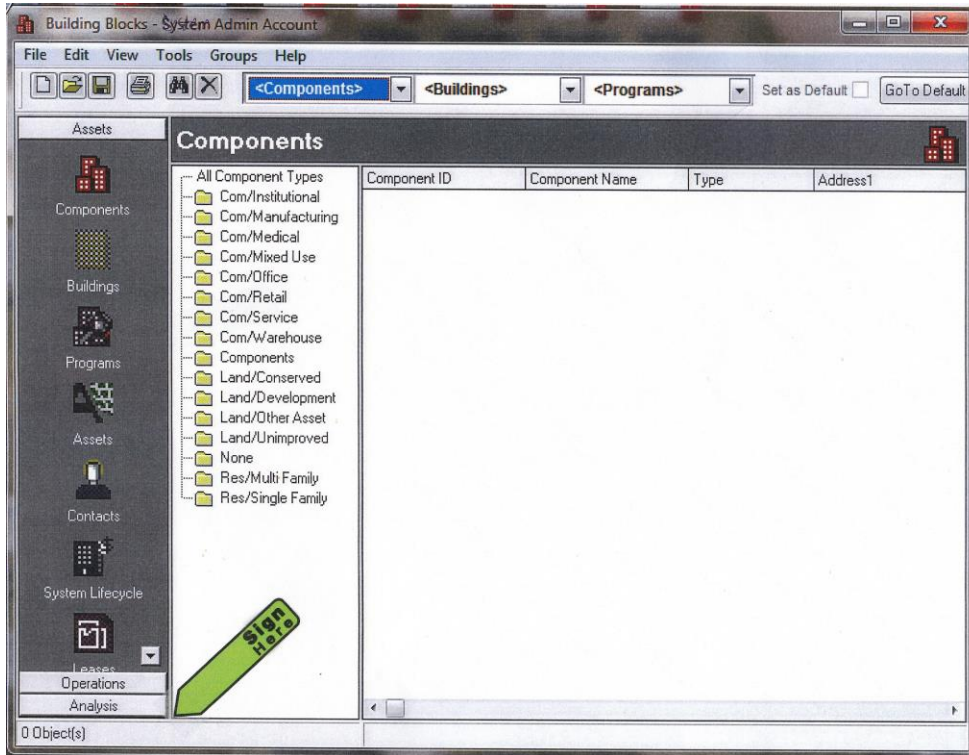
Actions

-
-
-
-
-

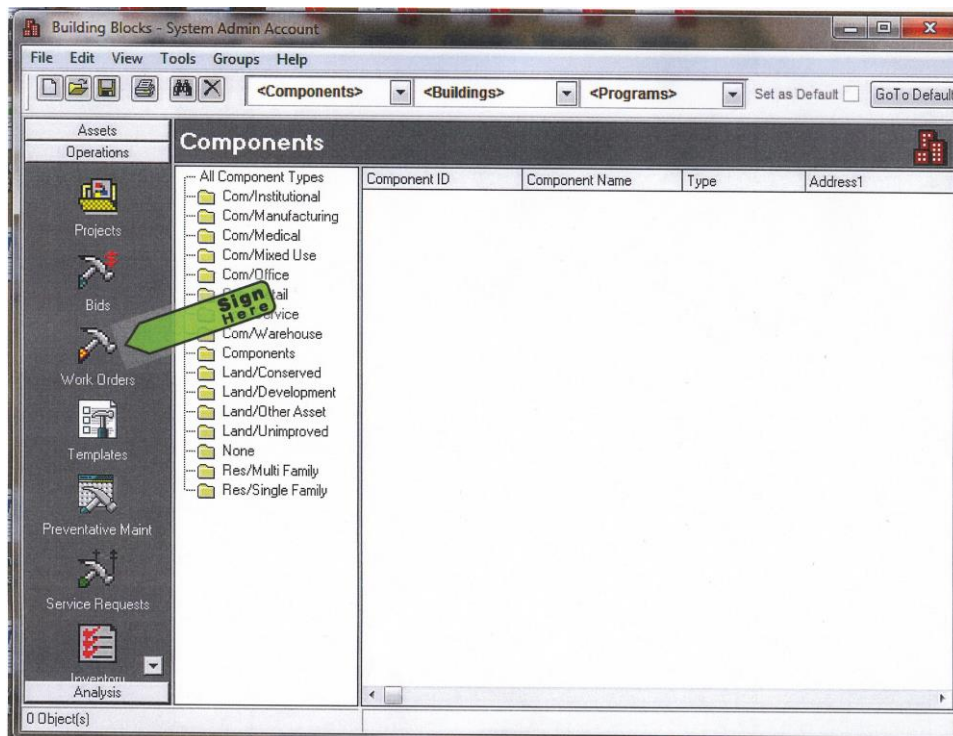
[Share and more...](#)

Picture A2.3 – Task

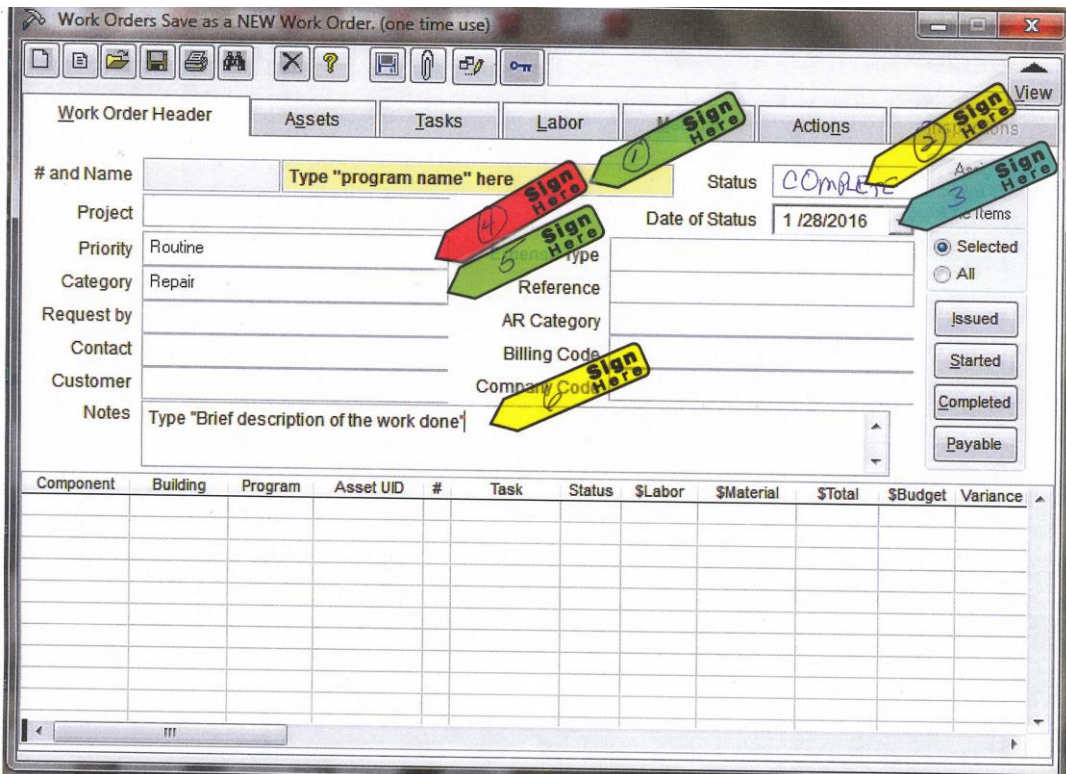
APPENDIX B: BUILDING BLOCK APPLICATION INTERFACE



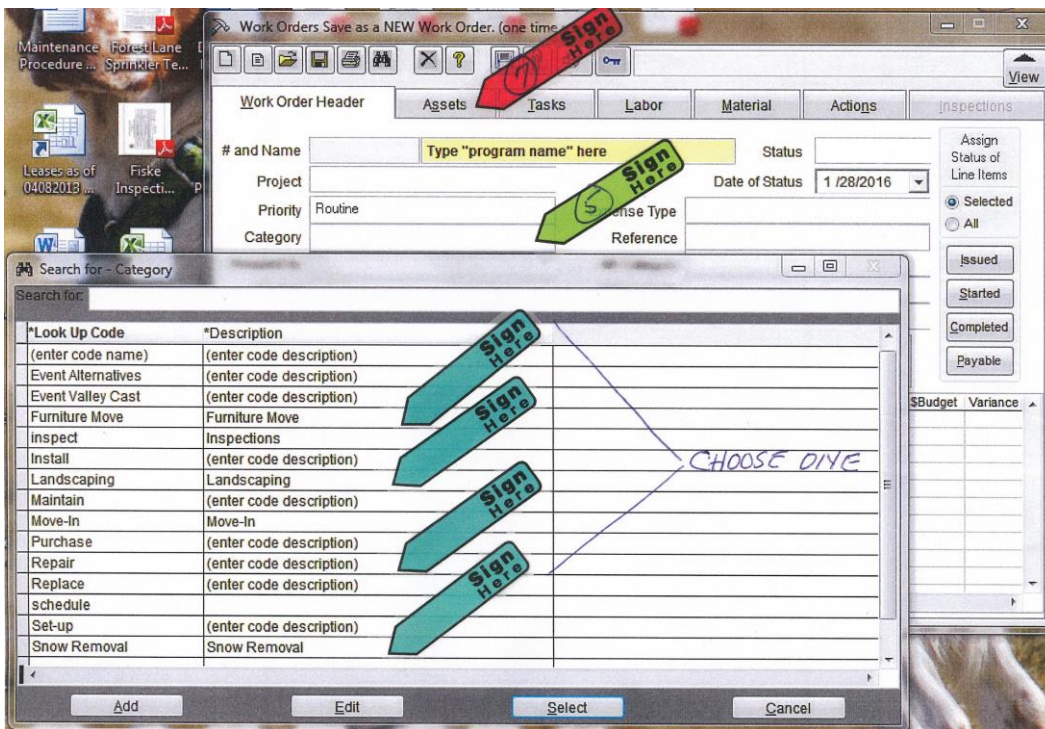
Picture B.1 – “Building Block Application” - Menu.



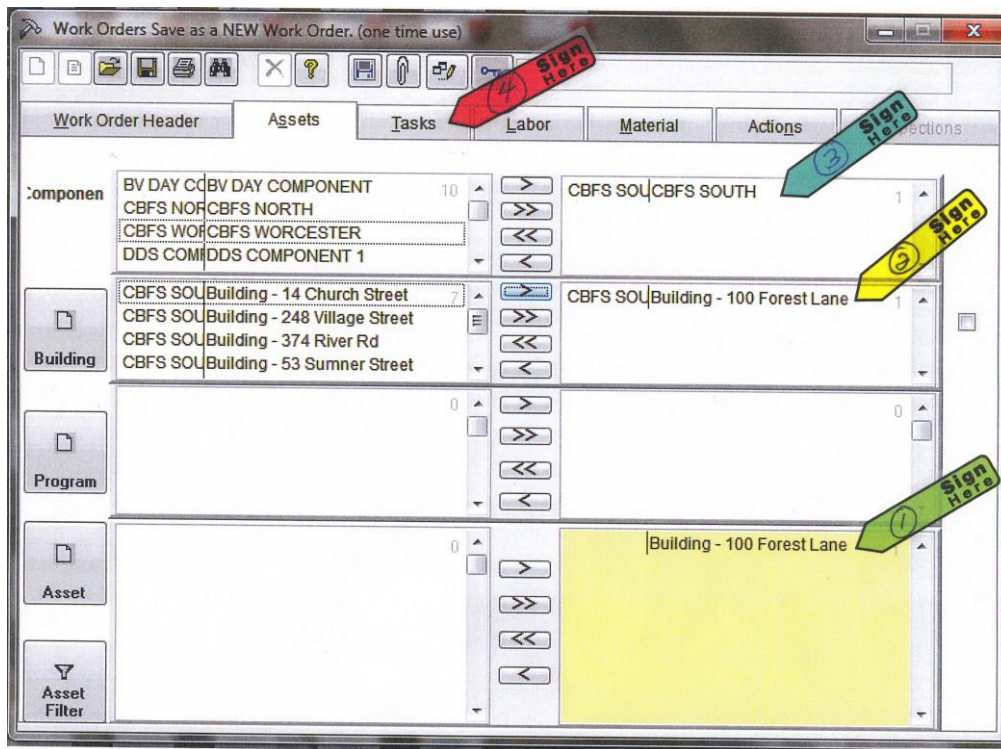
Picture B.2 – “Building Block Application” - Menu of “Operations.”



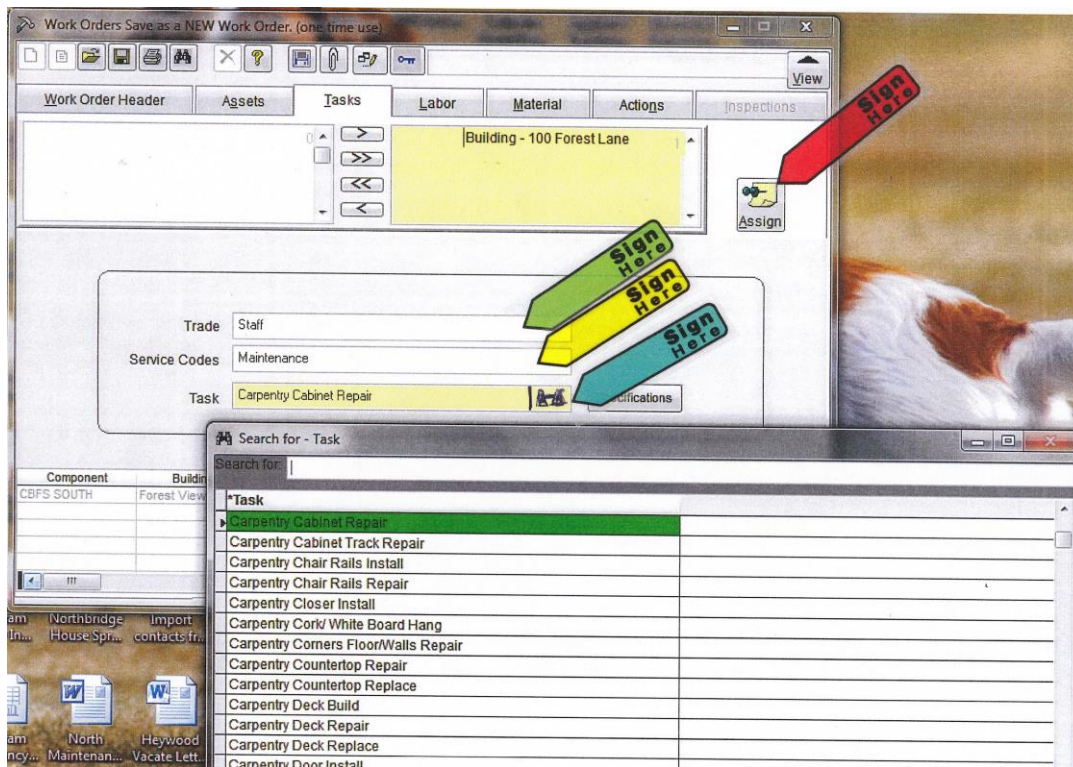
Picture B.3 – “Building Block Application” - Work Order creation process



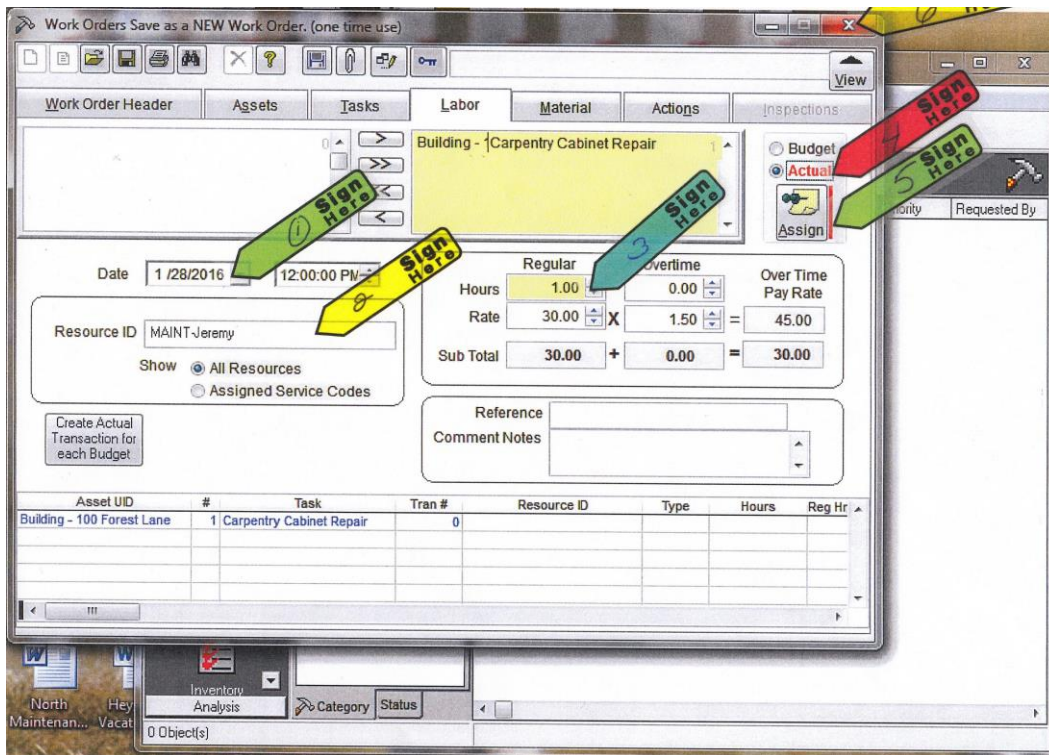
Picture B.4 – “Building Block Application” - Searching example



Picture B.5 – “Building Block Application” – Assets



Picture B.6 – “Building Block Application” - New task



Picture B.7 – “Building Block Application” - Labor

APPENDIX C: SOFTWARE REVIEWS

C1: Hippo CMMS



Requirements

Importance: H - High; M - Medium; L - Low

Table C1.1 - Functional requirement

Functional requirement	I	Hippo CMMS
The solution must provide mobile app for, at least, next user-stories:		
• Manage inspections (all user-stories)	H	Yes
• Manage work orders (all user-stories)	H	Yes
• Manage worker's schedule	M	yes
• Inventory	M	yes
The solution must provide an opportunity to attach photos to orders and inspections	M	Yes
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes. Many different statuses
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes. The solution provides a list of reports. There is an opportunity to customized reports
The solution must provide an opportunity to prioritize orders.	H	yes
The solution must provide an opportunity to manage of worker's schedule.	M	Yes.
The solution must allow group locations by components, buildings and apartments.	H	Yes.

Table C1.2 - Nonfunctional requirement

Nonfunctional requirement	I	Hippo CMMS
The application must work fast (The creation of order must take 30 sec or less)	H	Yes.
The interface must be simple and suitable for daily using	H	The interface of the mobile app and website is really simple.

User-stories

Table C1.3 - User-stories

User-story	I	Hippo CMMS
<u>Authorizing in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Add new user • Edit user's information • Manage user's rights • Delete a user 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes
<u>Manage inspections</u>		
<ul style="list-style-type: none"> • Create the inspection 	H	Yes. Like one of the types of work order
<ul style="list-style-type: none"> ○ Create multiple recurring inspections 	M	Yes.
<ul style="list-style-type: none"> ○ Create a single inspection 	H	Yes.
<ul style="list-style-type: none"> • Edit the inspection 	H	Yes.
<ul style="list-style-type: none"> • Delete the inspection 	H	Yes.

• Planning/schedule inspections	H	Yes.
• Search the inspection	H	Yes.
• Conduct the inspection	H	Yes.
• Re-inspection	M	No. You can use the previous one as a template or duplicate it.
<u>Manage work orders</u>		
• Create the work order	H	Yes.
○ Create a single work order	H	Yes.
▪ Create the order by unit	H	Yes.
▪ Create the order for multiple units	M	No.
○ Create recurring work order	M	Yes.
▪ Create the order for multiple units	M	No.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	Yes.
• Search the work order	H	Yes.
<u>Manage worker's schedule</u>	M	Yes.
<u>Manage reports</u>		
• Configure report (Alternative is a sufficient list of reports)	H	Yes. The solution provides a list of reports. There is an opportunity to customized a new type of report.
• Build report	H	Yes.

<u>Manage assets</u> <ul style="list-style-type: none"> ● Add assets ● Search assets ● Transfer assets ● Edit assets ● Delete assets 	L	Yes.
<u>Inventory</u> <ul style="list-style-type: none"> ● Add inventory ● Search inventory ● Edit inventory ● Delete inventory 	L	Yes.

Key features

- Automatic push e-mail notifications when work orders have been submitted, assigned, updated and closed
- Various work order status and priority settings
- Easily view and sort work orders by status, type, priority, location, due date and assigned resource from the Standard Dashboard
- View and manage work orders from floor plans from the Advanced Dashboard
- Work orders can be searched by set criteria, printed off individually or in batches.
- Simple work order management software from the field with Hippo CMMS's mobile app.
- Real-time e-mail updates on maintenance requests²³

²³ <http://www.hippocmms.com/products/features-dashboards/work-order-management-software>

UI examples

The dashboard displays a list of work orders with the following columns: ID, Name, Status, Type, Demand/YN, Priority, Category, and Assoc. A sidebar on the right provides a summary for the 'Education' facility.

ID	Name	Status	Type	Demand/YN	Priority	Category	Assoc.
22588	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22584	worker	Overdue	Location	Demand	High	Door Inspector	103
22580	IT Door	Overdue	Location	Demand	Low		201
22567	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22551	AC UNIT FILTER REPLACEMENT	Overdue	Equipment	PH		HVAC	AC Un Unit 2
22541	HVAC UNIT MONTHLY INSPECTION	Overdue	Equipment	PH		HVAC	AC Un
22536	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22526	Chico Museum Cten up	Not Started	Location	Demand	Medium	Clearing	105
22521	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22518	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22512	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22507	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22503	HVAC UNIT MONTHLY INSPECTION	Overdue	Equipment	PH		HVAC	AC Un
22497	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22467	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22475	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22433	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un
22424	HVAC UNIT MONTHLY INSPECTION	Overdue	Equipment	PH		HVAC	AC Un
22422	AC unit monthly inspection and maintenance	Overdue	Equipment	PH		HVAC	AC Un

Summary (Education):
 Facilities: 1
 Demands: 21
 Overdue: 42
 Critical: 0
 Total: 62

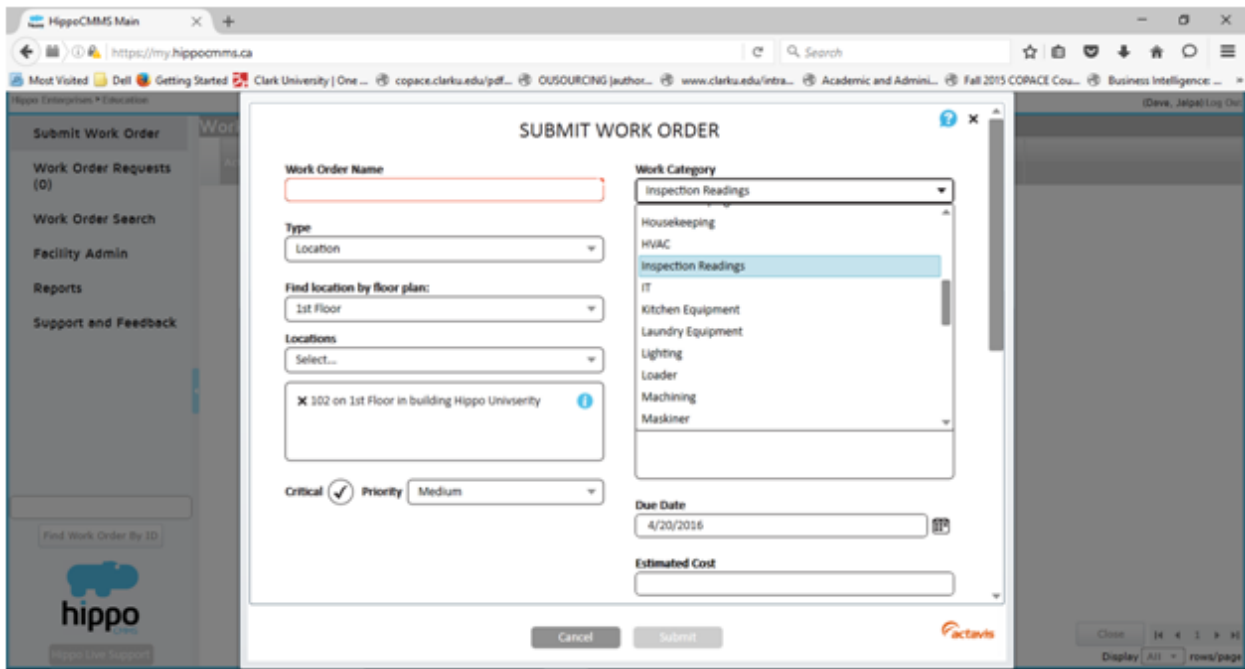
Picture C1.1 – Dashboard

The 'SUBMIT WORK ORDER' form includes the following fields and options:

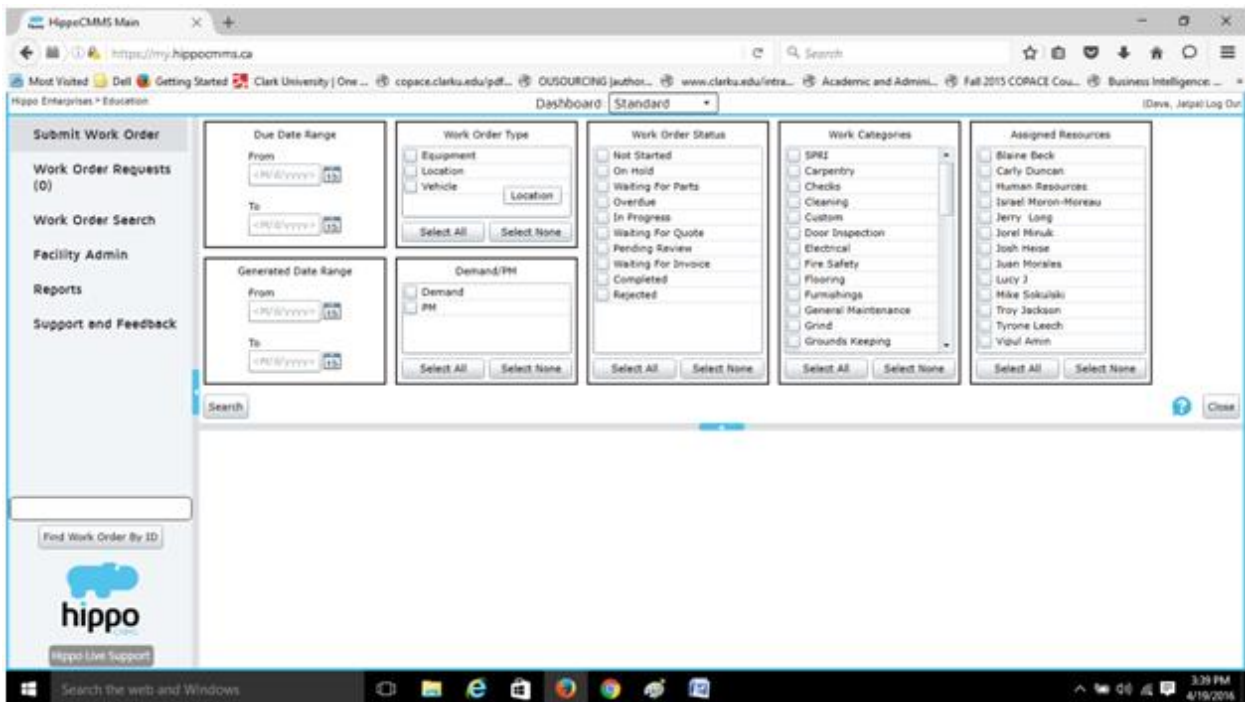
- Work Order Name:** Text input field.
- Work Category:** Dropdown menu with '(None)' selected.
- Type:** Dropdown menu with 'Location' selected.
- Company Category:** Dropdown menu with '(All)' selected.
- Find location by floor plan:** Dropdown menu with '(All)' selected.
- Company:** Dropdown menu with '(None)' selected.
- Locations:** Dropdown menu with 'Select...' selected.
- Resources:** Dropdown menu with 'Select...' selected.
- Critical:** Radio button (unchecked).
- Priority:** Dropdown menu with 'Medium' selected.
- Due Date:** Date input field.
- Estimated Cost:** Text input field.

Buttons: Cancel, Submit. Logo: actavis.

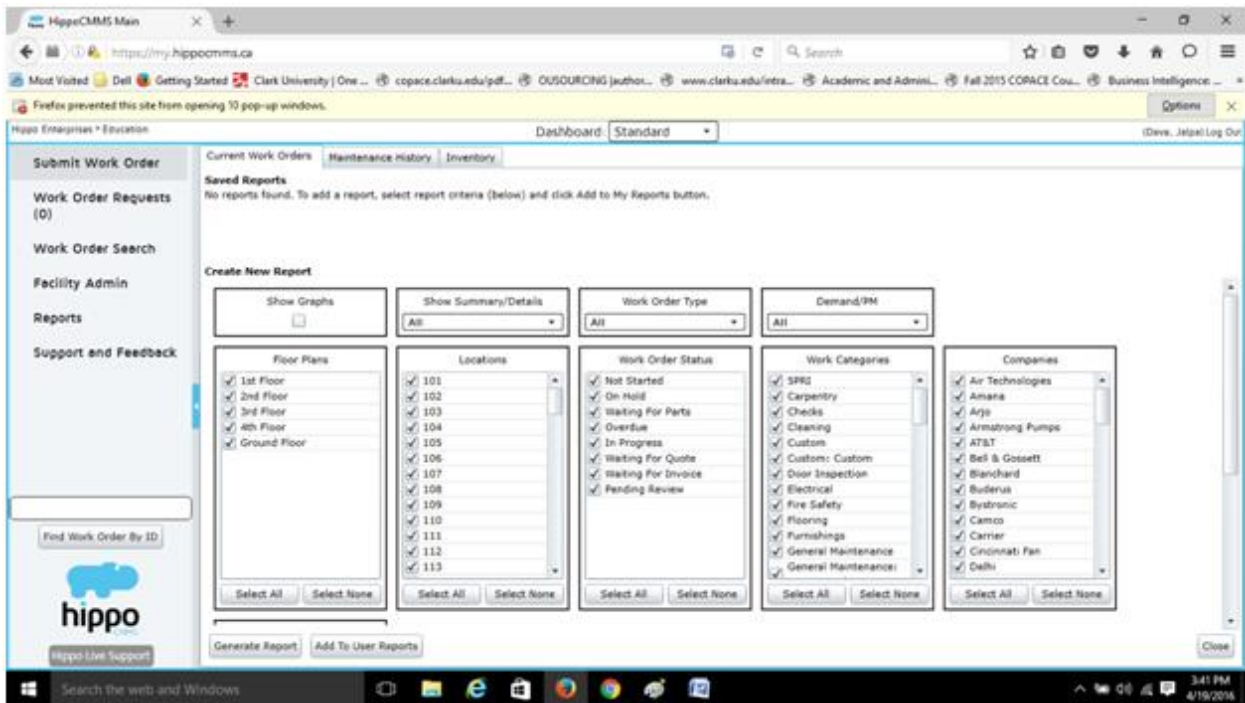
Picture C1.2 – Work Order



Picture C1.3 – Inspection

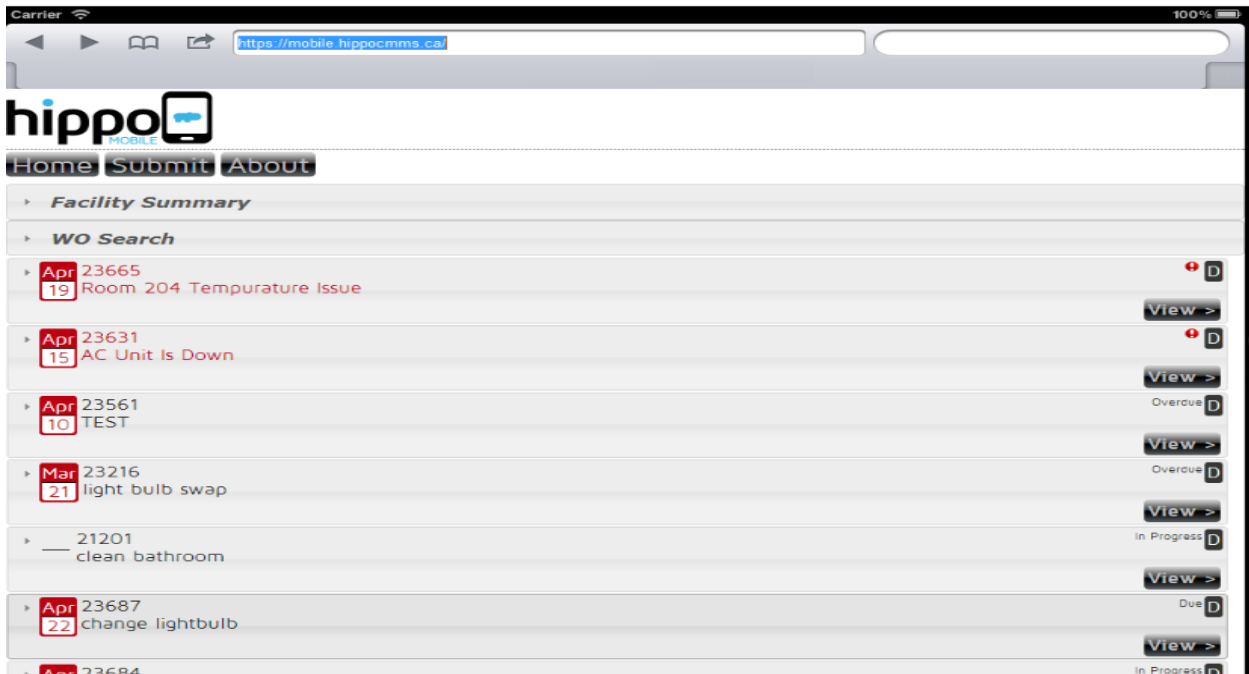


Picture C1.4 - Work order search



Picture C1.5 - Generate Reports

Mobile application's UI examples



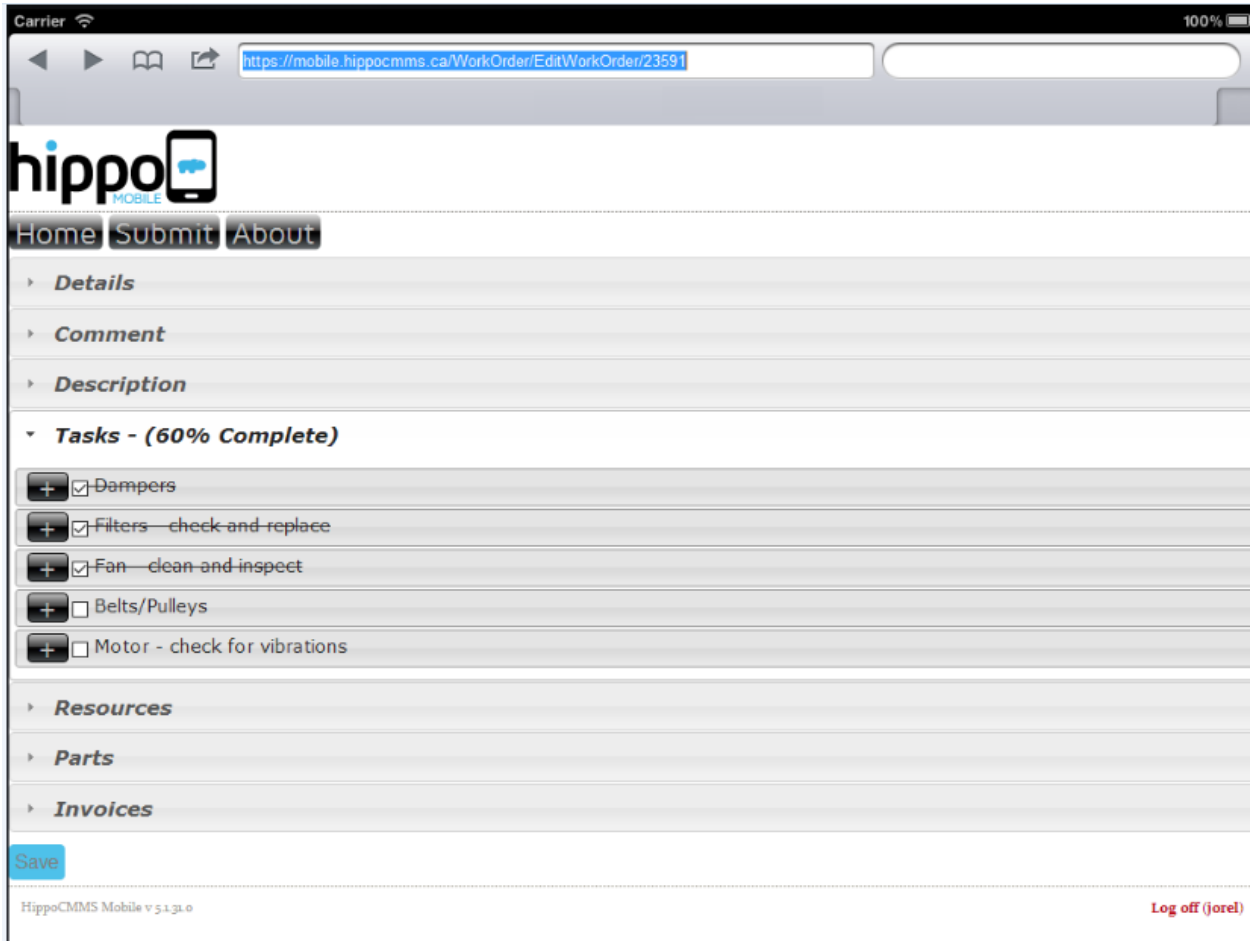
Picture C1.6 - Homepage

Facility	PM	D	Critical	Overdue
City Hall	15	14	0	16
Education	13	27	2	16
Fire Station	23	8	0	22
Healthcare	19	37	0	35
Hospitality	64	15	2	42
Library	6	4	0	1
Manufacturing	63	28	0	28

Picture C1.7 - Facility Summary

Date	Description	Status
15	AC Unit is Down	Overdue
Apr 10	23561 TEST	Overdue
Mar 21	23216 light bulb swap	Overdue
—	21201 clean bathroom	In Progress
Apr 22	23687 change lightbulb Anthony Mariani	Due
Apr 22	23684 TEST	In Progress
Apr 19	23682 TEST	Overdue
Apr 21	23674 Equipment is Down	Due
Apr	23666	Due

Picture C1.8 - Work Order's brief Description



Picture C1.9 - Work Order's editing

C2: eQuest**Requirements**

Importance: H - High; M - Medium; L - Low

Table C2.1 - Functional requirement

Functional requirement	I	eQuest
The solution must provide mobile app for, at least, next user-stories:		
• Manage inspections (all user-stories)	H	Yes.
• Manage work orders (all user-stories)	H	Yes.
• Manage worker's schedule	M	No.
• Inventory	M	No.
The solution must provide an opportunity to attach photos to orders and inspections	M	Yes.
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes.
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes. The solution provides report designer.
The solution must provide an opportunity to prioritize orders.	H	No.
The solution must provide an opportunity to manage of worker's schedule.	M	Yes.
The solution must allow group locations by components, buildings and apartments.	H	Yes. But the primary concept is Client, not Unit

Table C2.2 - Nonfunctional requirement

Nonfunctional requirement	I	eQuest
The application must work fast (The creation of order must take 30 sec or less)	H	No. Speed of work during the demo presentation was inappropriate. Plus, for creating a work order, the user should fill many fields.
The interface must be simple and suitable for daily using	H	No. The interface is complicated and not user-friendly.

User-stories

Table C2.3 - User-stories

User-story	P	eQuest
<u>Authorizing in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Add new user • Edit user's information • Manage user's rights • Delete a user 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes.
<u>Manage inspections</u>		
<ul style="list-style-type: none"> • Create the inspection 	H	Yes. There is an opportunity to create customs template for inspections.
<ul style="list-style-type: none"> • Create multiple recurring inspections 	M	No.
<ul style="list-style-type: none"> o Create a single inspection 	H	Yes.
<ul style="list-style-type: none"> o Edit the inspection 	H	Yes.

• Delete the inspection	H	Yes.
• Planning/schedule inspections	H	No. Only Work Orders can be planned.
• Search the inspection	H	Yes.
• Conduct the inspection	H	Yes.
• Re-inspection	M	No.
<u>Manage orders</u>		
• Create the work order	H	Yes.
o Create a single work order	H	Yes.
✓ Create the order by unit	H	Yes, but units are linked to clients.
✓ Create the order for multiple units	M	No.
o Create recurring work order	M	Yes.
✓ Create the order for multiple units	M	No.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	Yes. Plus, there is an opportunity to attach photos “before” and “after.”
• Search the work order	H	Yes. There are a calendar and good search with many filters.
<u>Manage worker’s schedule</u>	M	Yes.
<u>Manage reports</u>		

<ul style="list-style-type: none"> • Configure report (Alternative is a sufficient list of reports) 	H	Yes. The solution provides report designer and several charts.
<ul style="list-style-type: none"> • Build report 	H	Yes. Excel.
<u>Manage assets</u> <ul style="list-style-type: none"> • Add assets • Search assets • Transfer assets • Edit assets • Delete assets 	L	Manage equipment.
<u>Inventory</u> <ul style="list-style-type: none"> • Add inventory • Search inventory • Edit inventory • Delete inventory 	L	Yes.

Functions and services that are included in the one-time eQuest set-up fee:

- The company imports your provided client information.
- The company customizes lists on eQuest to match your company's services.
- The company provides online training for your eQuest point person.
- Plenty of behind the scenes configuration work necessary to get your company up and running using eQuest.
- Free mobile apps for your employees and customers to use with their Apple (iOS) and Android phones and tablets.
- The company provides your personalized web address for you and your clients to access eQuest.
- The company Personalizes the software with your company logo - it's branded to look like your software.
- The company provides code for your web designer to install an eQuest log-in access for your customers and employees right from your existing website.

UI examples

YOU HAVE SYSTEM ALERTS Today's date: 11/05/2013 | Administrator: John Smith Logout

New Work Order Search Schedules Customer Mgmt Quality Assurance Commissions Billing Site Management Reports

CALENDAR NOVEMBER 2013

NEW SUBMITTED ORDERS - Work Order status is new

Order #	Type	Customer & Property	Work to be Performed	Status
2017	Landscape - Exterior	Ackers Property Management / Burbank Center	10/31/2013 : night only	New - Requires Review
1419	Landscape - Exterior	Ackers Property Management / Nestly building	10/17/2013 : any	New - Requires Review
1406	Landscape - Exterior	Half Foods / HF 56	03/22/2013 :	New - Requires Review
1414	Landscape - Exterior	Half Foods / HF 56	03/18/2013 :	New - Requires Review
332	Landscape - Exterior	Ackers Property Management / Burbank Center	02/14/2013 : any	New - Requires Review

WORKORDERS DECLARED COMPLETE - Work Order has been declared completed on one or more timecards

Order #	Type	Customer & Property	Work to be Performed	Status
---------	------	---------------------	----------------------	--------

NEW TENANT OCCUPANCY CHANGE LOOKUP

Occ #	Date	Customer	Property	Status	Location
-------	------	----------	----------	--------	----------

REQUESTED QUOTES - quote is requested

Quote#	Type	Customer	Property	Status	Submitted	Requested
--------	------	----------	----------	--------	-----------	-----------

Employee Documents

Work Order Lookup go >>

Invoice # Lookup go >>

Picture C2.1 – Home screen

Demonstration BUILDING MAINTENANCE

MY DASHBOARD Today's date: 04/07/2016 | Administrator: Robin Robertson Logout

New Work Order Search Schedules Customer Mgmt Quality Assurance Commissions Billing Site Management Reports

4/7/2016 10:45:17 A.M.

New Walkthrough

Walkthrough Lookup

Walkthrough Correction List

Walkthrough Customization

SIR Lookup

Supervisor Notes

Walkthrough Form #2146

Customer Quality Goods Quality Goods [Atlanta #1] -- by customer -- Go >> -- by property -- Go >> Print

This customer is flagged to use the custom walkthrough form: FRESENIUS

Date: 02/04/2016 Address: 321 Goodman St Ashland, Ga, 84332

Time: 10:46 AM

Status: In Review

Type: Janitorial

Inspection performed by: Hernandez, Jose

Private Notes

Walkthrough Notes History

Date	User	Text
(no note history recorded)		

New Note

Walkthrough Images & Files

view photos view files attach files

Images available for this work walkthrough: 1

Last Updated by Robin Robertson 02/04/2016

This Walkthrough is Private Send email alert to customer/property

Alerted when New [] Alerted when Complete []

Picture C2.2 – Inspection

C3: Fleetmatics



Requirements

Importance: H - High; M - Medium; L - Low

Table C3.1 - Functional requirement

Functional requirement	I	Fleetmatics
The solution must provide mobile app for, at least, next user-stories:		
<ul style="list-style-type: none"> • Manage inspections (all user-stories) 	H	Yes
<ul style="list-style-type: none"> • Manage work orders (all user-stories) 	H	Yes
<ul style="list-style-type: none"> • Manage worker's schedule 	M	No
<ul style="list-style-type: none"> • Inventory 	M	No
The solution must provide an opportunity to attach photos to orders and inspections	M	Yes
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes. Many different statuses
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes. The solution provides a list of reports. There is an opportunity to request a new type of report.
The solution must provide an opportunity to prioritize orders.	H	No. But there is an opportunity to schedule works orders.
The solution must provide an opportunity to manage of worker's schedule.	M	Yes.
The solution must allow group locations by components, buildings and apartments.	H	Yes.

Table C3.2 - Nonfunctional requirement

Nonfunctional requirement	I	Fleetmatics
The application must work fast (The creation of order must take 30 sec or less)	H	Yes.
The interface must be simple and suitable for daily using	H	The interface of the mobile app is really simple, but web application has a lot of details.

User-stories

Table C3.3 - User-stories

User-story	I	Fleetmatics
<u>Authorizing in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Add new user • Edit user's information • Manage user's rights • Delete a user 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes
<u>Manage inspections</u>		
• Create the inspection	H	Yes. Like one of the types of job.
o Create multiple recurring inspections	M	Yes.
o Create a single inspection	H	Yes.
• Edit the inspection	H	Yes.
• Delete the inspection	H	Yes.

• Planning/schedule inspections	H	Yes.
• Search the inspection	H	Yes.
• Conduct the inspection	H	Yes.
• Re-inspection	M	No. You can use the previous one as a template or duplicate it.
<u>Manage work orders</u>		
• Create the work order	H	Yes.
o Create a single work order	H	Yes.
✓ Create the order by unit	H	Yes. The primary concept is a client, not a unit.
✓ Create the order for multiple units	M	No. Only create a new one. But you can use the previous one like template or duplicate it
o Create recurring work order	M	Yes.
✓ Create the order for multiple units	M	No.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	Yes.
• Search the work order	H	Yes. Calendar format + List format
<u>Manage worker's schedule</u>	M	Yes.
<u>Manage reports</u>		
• Configure report (Alternative is a	H	Yes. The solution provides a list of

sufficient list of reports)		reports. There is an opportunity to request a new type of report.
• Build report	H	Yes. Excel or pdf
<u>Manage assets</u> <ul style="list-style-type: none"> • Add assets • Search assets • Transfer assets • Edit assets • Delete assets 	L	No.
<u>Inventory</u> <ul style="list-style-type: none"> • Add inventory • Search inventory • Edit inventory • Delete inventory 	L	Yes.

Additional features of the solution

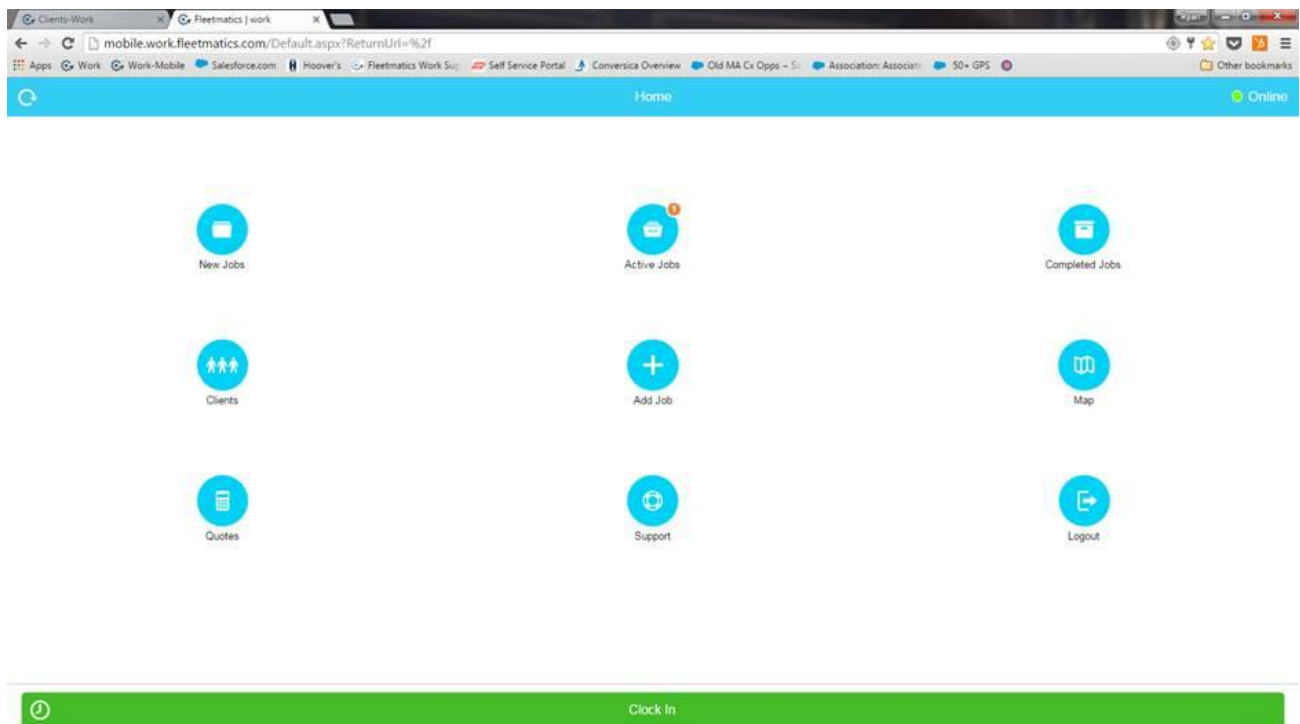
- GPS-tracking. Fleetmatics WORK sends a location to your field worker so they can get turn-by-turn directions to every job.
- Automatic SMS, email or push notifications with job details, location, and customer information.
- Opportunity to capture customer's signature. Field workers can digitally capture customer's signature via their mobile devices.
- Dashboards provide information via charts and allow to create "Job" in a fast way.

Functionality of mobile application

- Job details (the Job can have type "Work order" or "Inspection");
- Close a Job ("You can close a job when it's done from the job site.");
- Offline mode ("Makes sure you don't lose any data when you're out of range")
- Scheduling ("View job schedules and receive directions to your next job. Always know where and when your next job starts");
- Invoicing ("You can invoice your clients directly from your mobile device. Have your customers see the invoice as soon as the job is done.");

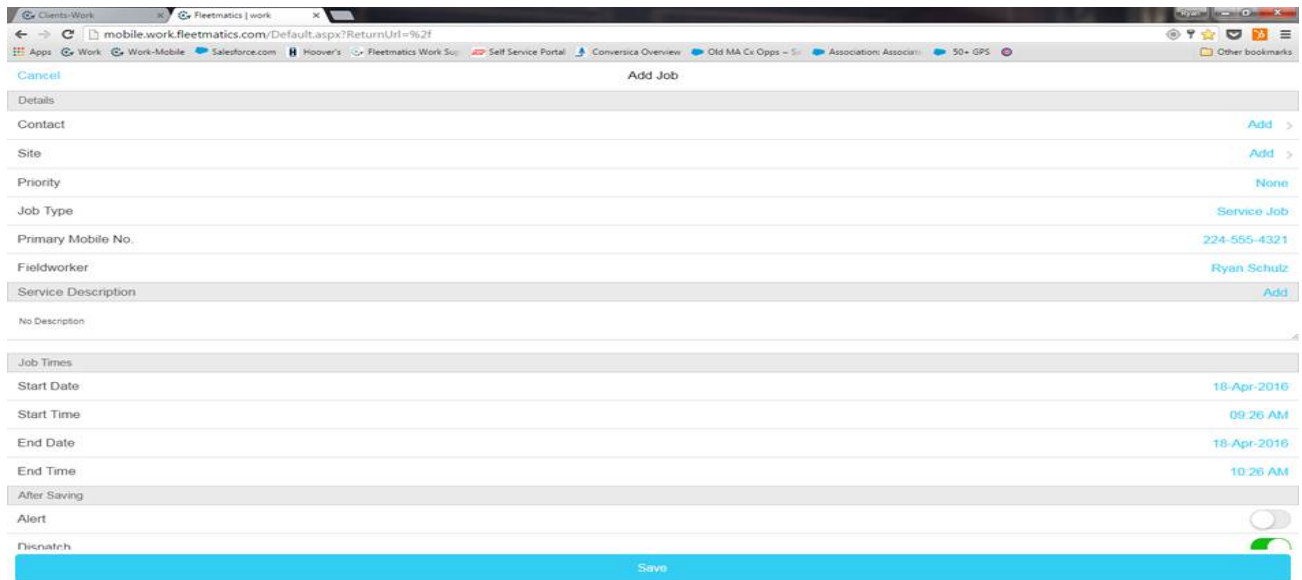
- Alerting (“Receive alerts via your mobile device; send updates to the office from the job site. You can send job alerts to your field workers either as SMS, email or push notifications.”)
- Signature capture (“Capture your customer’s signature via your mobile device as soon as the job is done.”);
- Pictures (“Capture images of the job site and parts and store them for your records”);
- Driving directions (“Get driving directions to your next job, so you get to you there quicker”)²⁴.

Mobile application’s UI examples



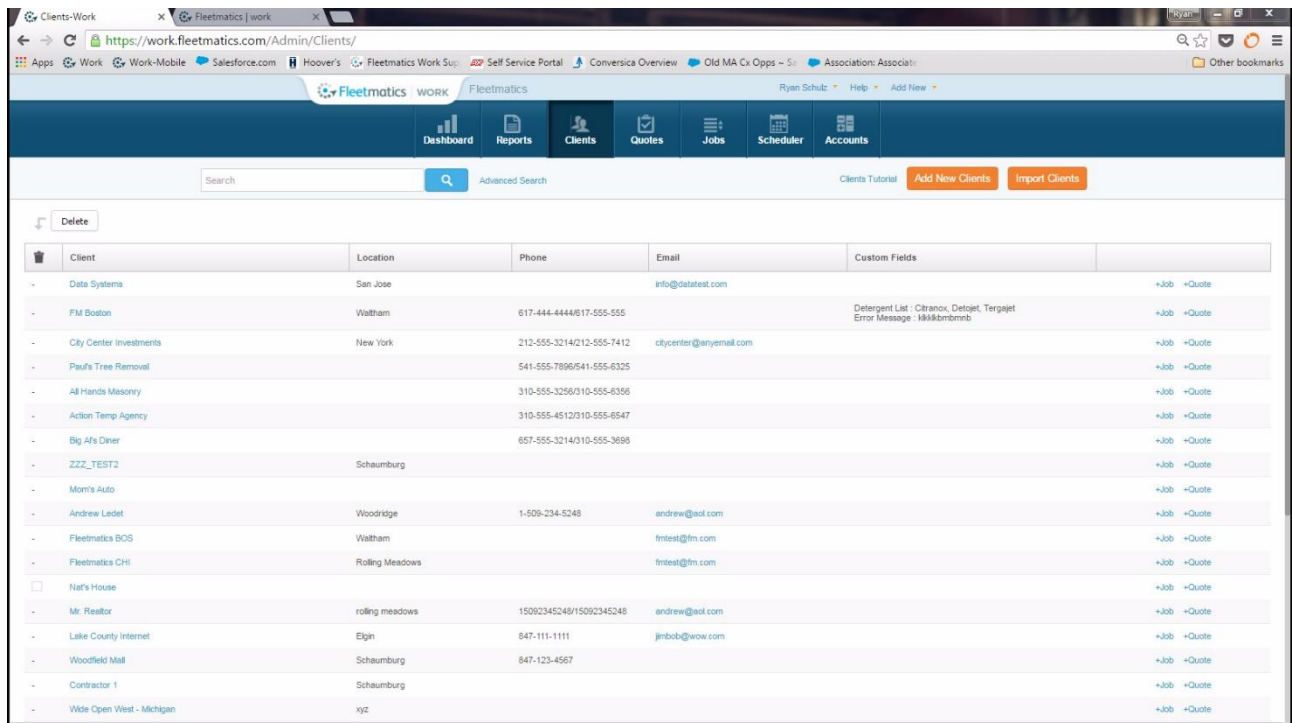
Picture C3.1 - Main screen

²⁴ Fleetmatics works brochure “Mobile Capabilities”

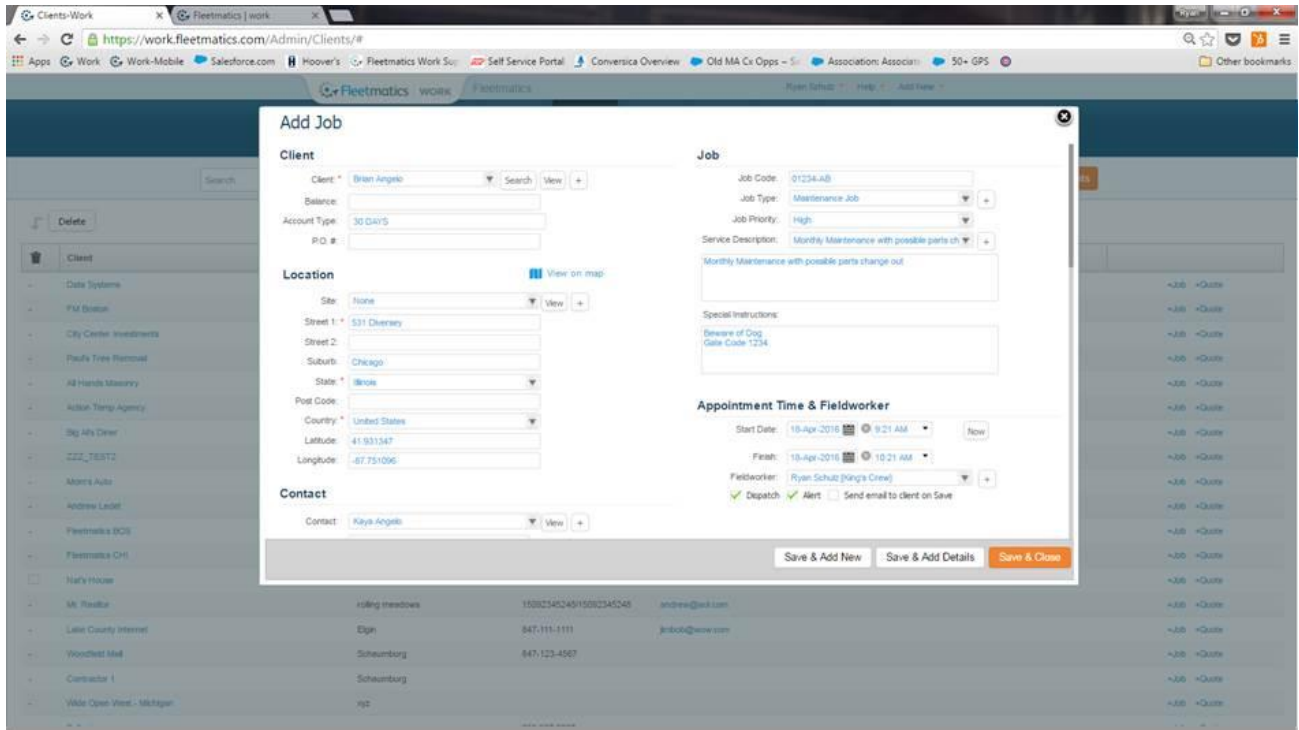


Picture C3.2 - Creating of work order (Creating an inspection is looking the same.)

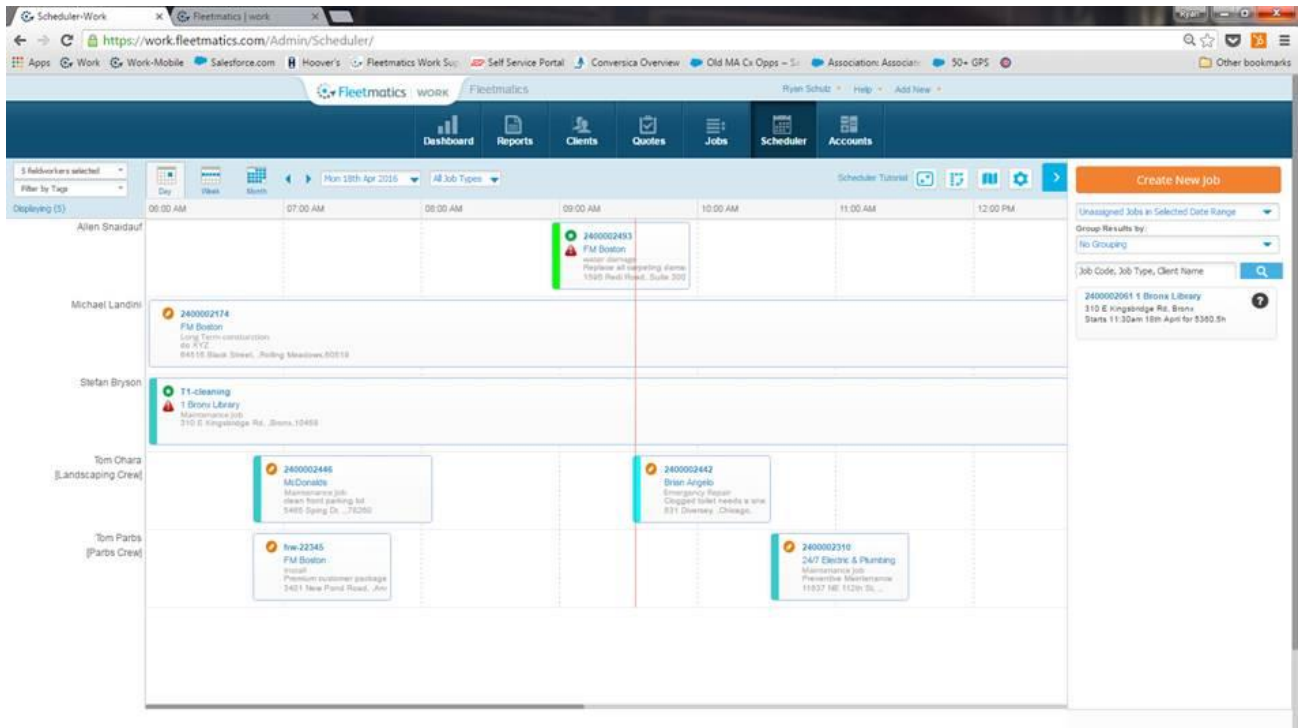
UI examples



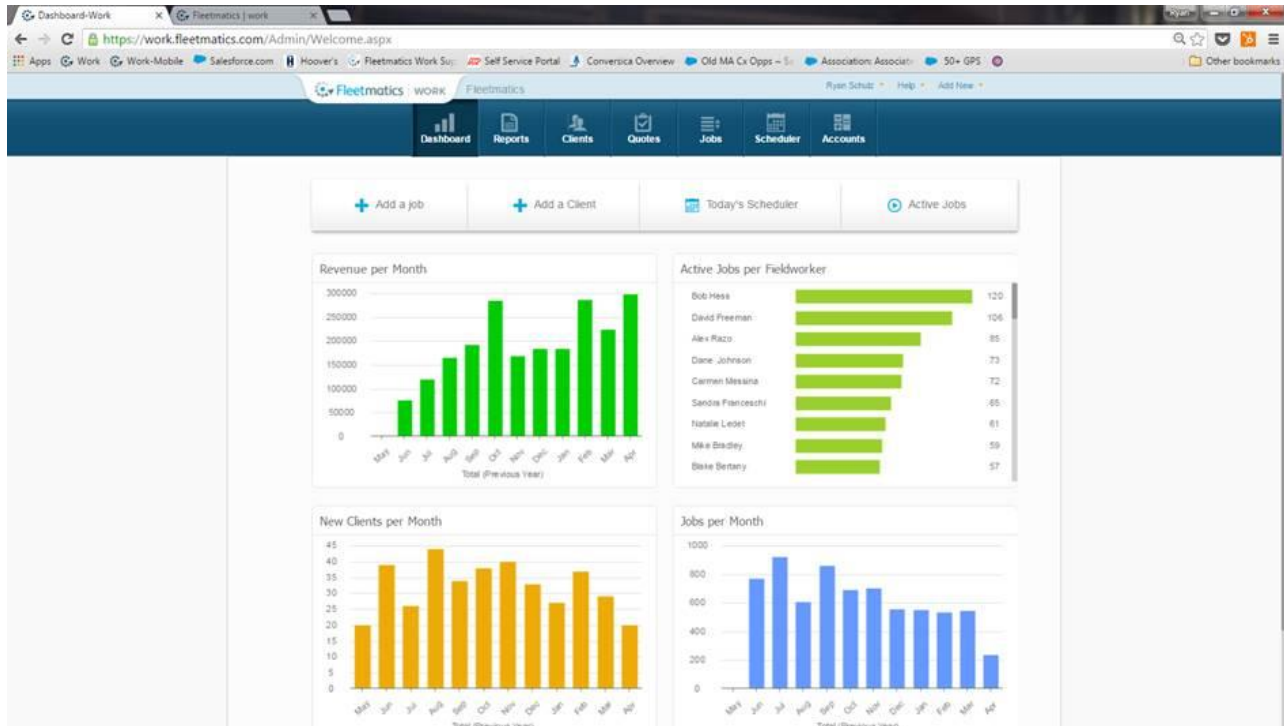
Picture C3.3 - Clients



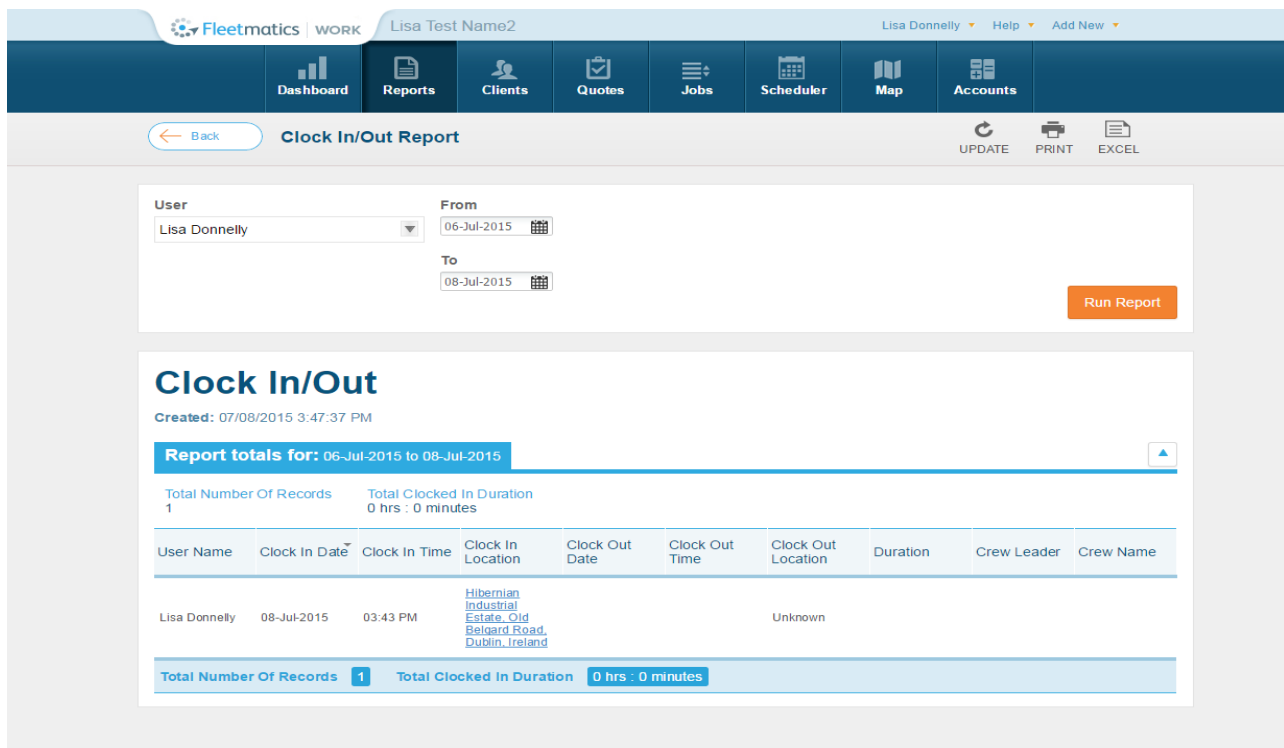
Picture C3.4 - Creating of work order (Inspection will look similar to WORK Order but in the drop down menu select Inspection, and it will load any custom fields for that Inspection)



Picture C3.5 - Schedule



Picture C3.6 - Dashboard



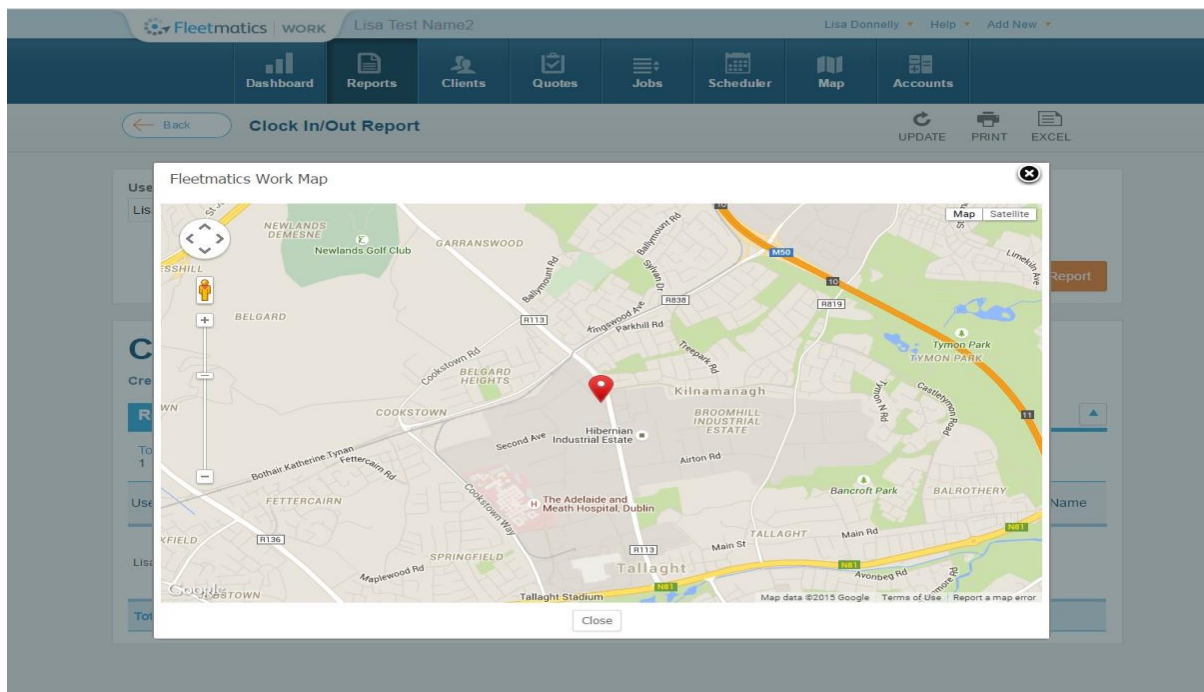
Picture C3.7 - Reports

← Back **Timesheet Report** UPDATE PRINT

Lead Z123 (18)

Job Code	Client	Job Status	Job Type	Travel Start	Travel Finish	Total Travel	Scheduled Start	Scheduled Finish	Estimated Total	Actual Start	Actual Finish	Actual Total
10297	99 Summer Street	✔		19-May-2015 10:17 AM	19-May-2015 10:17 AM		19-May-2015 09:00 AM	19-May-2015 11:00 AM	2h	-	-	
Travel Start Location				Travel Finish Location				Actual Start Location		Actual Finish Location		
Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland				Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland				Unknown		Unknown		
Task Code	Task Type	Service Description		Completion Notes								
T1-10297				Vvb								
T2-10297				Vvb								
10299	1105 Condominium Trust	★		19-May-2015 10:41 AM	19-May-2015 10:41 AM		19-May-2015 10:38 AM	19-May-2015 11:38 AM	1h	19-May-2015 10:43 AM	19-May-2015 10:43 AM	
Travel Start Location				Travel Finish Location				Actual Start Location		Actual Finish Location		
Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland				Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland				Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland		Hibernian Industrial Estate, Cookstown Road, Dublin, Ireland		
10296	5 Napkin Burger	★		19-May-2015 10:05 AM	19-May-2015 10:05 AM		19-May-2015 09:00 AM	19-May-2015 10:00 AM	1h	19-May-2015 10:48 AM	19-May-2015 10:48 AM	

Picture C3.8 - Timesheet report



Picture C3.9 - Work map

C4: Rentec Direct

Requirements



Importance: H - High; M - Medium; L - Low

Table C4.1 - Functional requirement

Functional requirement	P	ProLease
The solution must provide mobile app for, at least, next user-stories:		
• Manage inspections (all user-stories)	H	Yes
• Manage work orders (all user-stories)	H	Yes
• Manage worker's schedule	H	No
• Inventory	H	No
The solution must provide an opportunity to attach photos to orders and inspections	M	No
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes
The solution must provide an opportunity to prioritize orders.	H	No
The solution must provide an opportunity to manage of worker's schedule.	M	No.
The solution must allow group locations by components, buildings and apartments.	H	No.

Table C4.2 - Nonfunctional requirement

Nonfunctional requirement	P	Rentec Direct
The application must work fast (The creation of order must take 30 sec or less)	H	No.
The interface must be simple and suitable for daily using	H	Simple for the web.

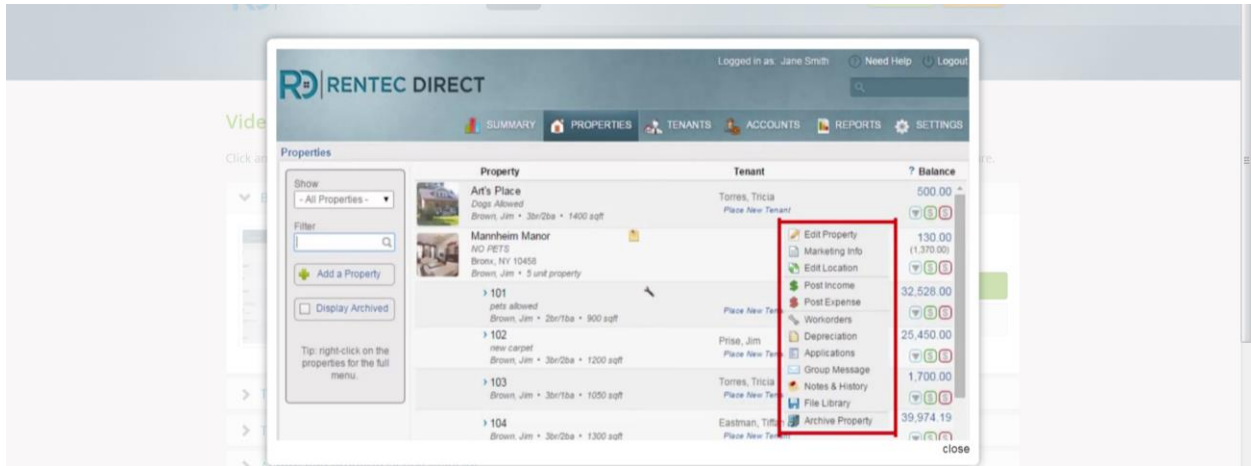
User-stories

Table C4.3 - User-stories

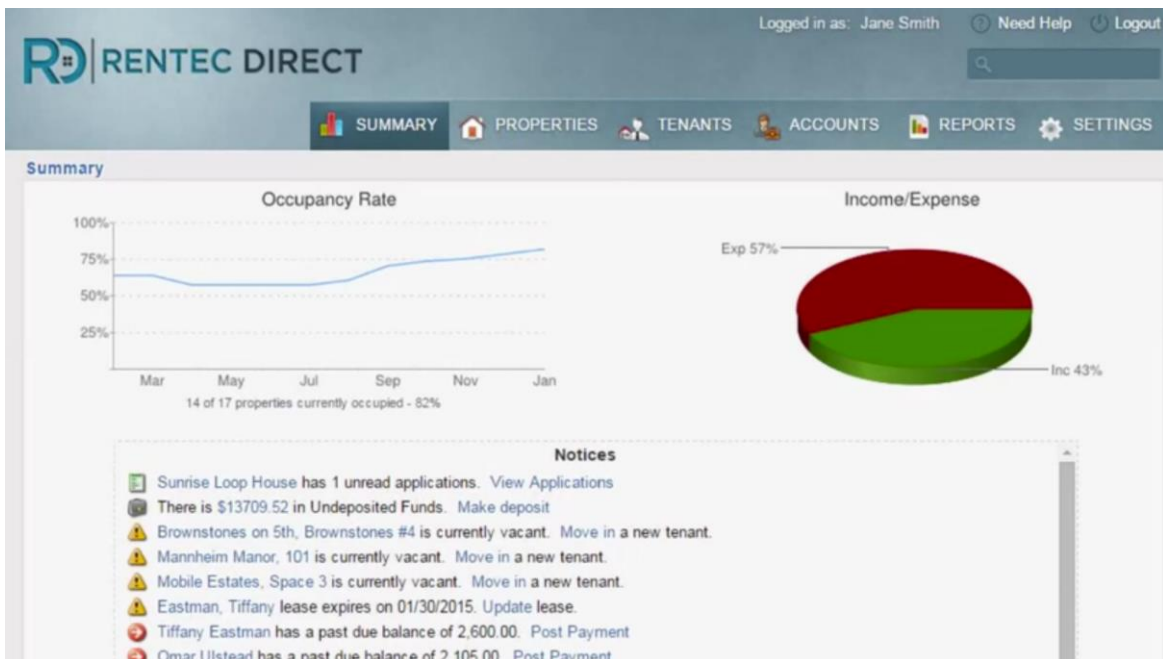
User-story	I	Rentec Direct
<u>Authorize in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Create user • Edit user • Delete user • Manage user's rights 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes.
<u>Manage inspections</u>		
• Create the inspection	H	Yes.
<ul style="list-style-type: none"> ○ Create multiple annual inspections 	M	Yes.
<ul style="list-style-type: none"> ○ Create individual inspection 	H	Yes.
• Delete the inspection	H	Yes.
• Planning/schedule inspections	H	Yes.
• Search the inspection	H	Yes.

• Conduct the inspection	H	Yes.
<u>Manage orders</u>		
• Create the work order	H	Yes.
o Create single work order	H	Yes.
o Create recurring work order	M	Yes.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	No.
• Search the work order	H	Yes.
<u>Manage worker's schedule</u>	M	No.
<u>Manage reports</u>		
• Configure report	H	Yes. Depending on required format.
• Build report	M	Yes.
<u>Manage assets</u>	L	No.
• Add assets		
• Search assets		
• Transfer assets		
• Edit assets		
• Delete assets		
<u>Inventory</u>	L	No.
• Add inventory		
• Search inventory		
• Edit inventory		
• Delete inventory		

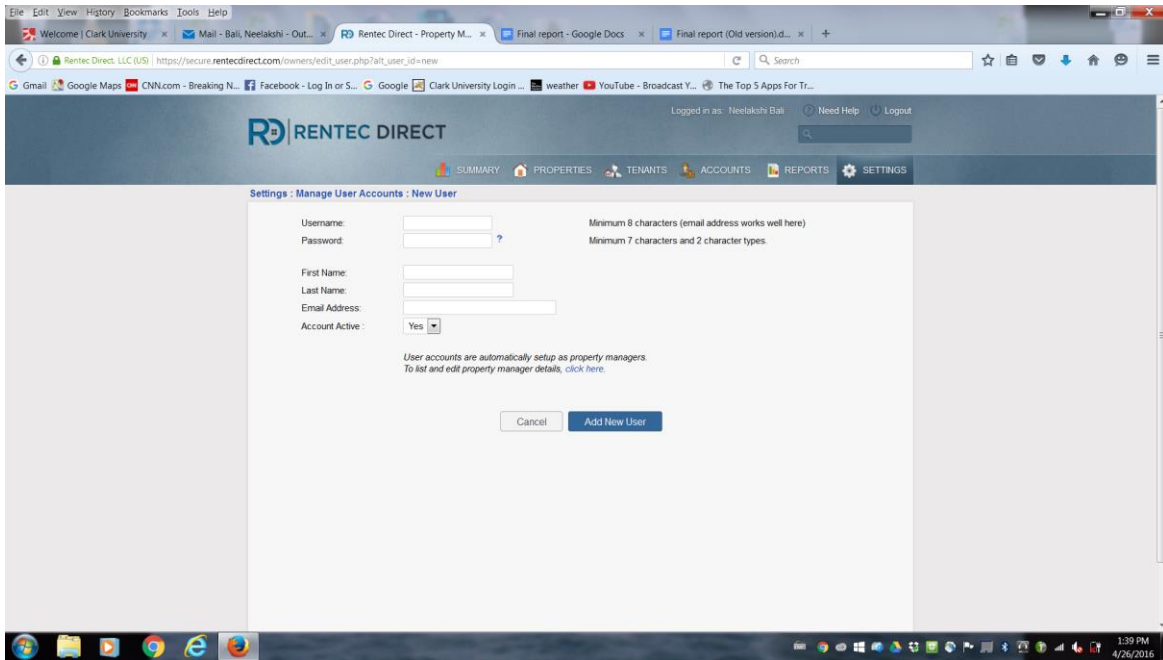
UI examples



Picture C4.1 – Search

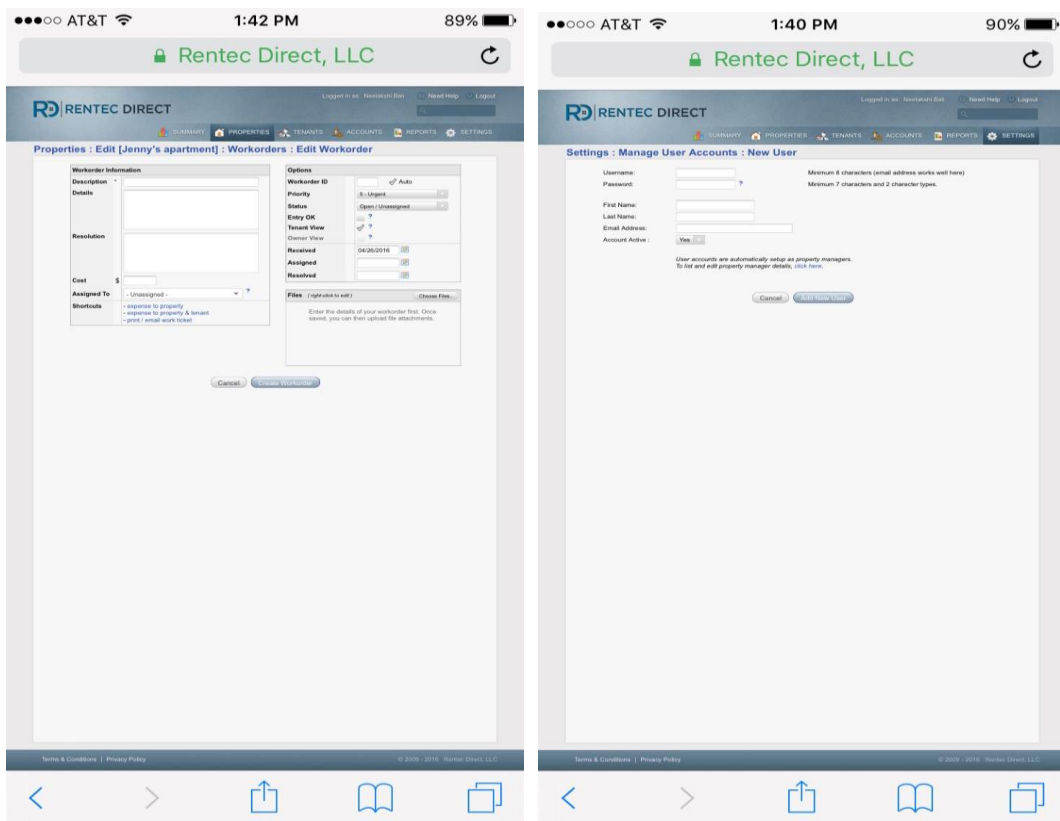


Picture C4.2 – Dashboard



Picture C4.3 - Creating user accounts

Mobile application's UI examples



Picture C4.4 - Adding user accounts and Creating work order

C5: PHA Web**Requirements**

Importance: H - High; M - Medium; L - Low

Table C5.1 - Functional requirement

Functional requirement	I	PHA-Web
The solution must provide mobile app for at least, next user-stories:		
<ul style="list-style-type: none"> Manage inspections (all user-stories) 	H	Yes. App for manage inspections allows create, edit, search, and conduct the inspections. Features: do not demand continuous access to the internet.
<ul style="list-style-type: none"> Manage work orders (all user-stories) 	H	No
<ul style="list-style-type: none"> Manage worker's schedule 	M	No
<ul style="list-style-type: none"> Inventory 	M	No
The solution must provide an opportunity to attach photos to orders and inspections	M	Yes
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	No. The order <u>does not</u> have a <u>workflow</u> .
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes. The solution provides a sufficient list of reports.
The solution must provide an opportunity to prioritize orders.	H	No.
The solution must provide an opportunity to manage of worker's schedule.	M	No.

The solution must allow group locations by components, buildings and apartments.	H	Yes
--	---	-----

Table C5.2 - Nonfunctional requirement

Nonfunctional requirement	I	PHA-Web
The application must work fast (The creation of order must take 30 sec or less)	H	No. The process of order's creation has a lot of steps and takes more than 30 sec.
The interface must be simple and suitable for daily using	H	Yes.

User-stories

Table C5.3 - User-stories

User-story	I	PHA-Web
<u>Authorizing in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Add new user • Edit user's information • Manage user's rights • Delete a user 	H	Yes. There is flexible possibility to manage users and their rights.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes.
<u>Manage inspections</u>		
<ul style="list-style-type: none"> • Create the inspection 	H	Yes.
<ul style="list-style-type: none"> • Create multiple recurring inspections 	M	Yes.
<ul style="list-style-type: none"> • Create a single inspection 	H	Yes.

• Edit the inspection	H	Yes.
• Delete the inspection	H	Yes.
• Planning/schedule inspections	H	Yes.
• Search the inspection	H	Yes.
• Conduct the inspection	H	Yes.
• Re-inspection	M	Yes.
<u>Manage orders</u>		
• Create the work order	H	Yes.
○ Create a single work order	H	Yes.
✓ Create the order by unit	H	Yes.
✓ Create the order for multiple units	M	Yes.
○ Create recurring work order	M	Yes.
✓ Create the order for multiple units	M	Yes.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes. But not convenient. For now, the field "Assignee" is not required and the user can assign the order later, but in the future, this field became required.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes. ?
• Verify of executed work order	H	No.
• Search the work order	H	Yes. But very inconvenient. Only by a number of order.

<u>Manage worker's schedule</u>	M	No.
<u>Manage reports</u>		
<ul style="list-style-type: none"> • Configure report (Alternative is a sufficient list of reports) 	H	Yes. The solution provides a sufficient list of reports. If the necessary report doesn't exist, the company is ready to create a new type of report or make a one-time query from the database.
<ul style="list-style-type: none"> • Build report 	H	Yes. There is a possibility to build a report in Excel or Pdf.
<u>Manage assets</u> <ul style="list-style-type: none"> • Add assets • Search assets • Transfer assets • Edit assets • Delete assets 	L	Yes.
<u>Inventory</u> <ul style="list-style-type: none"> • Add inventory • Search inventory • Edit inventory • Delete inventory 	L	Yes.

Detailed product information

PHA-Web software is organized into three main sections:

- **Tenant Management** – Tenant management performs tenant related tasks ranging from taking tenancy applications and creating waiting lists to performing federal certifications including TRACS Multifamily, Rural Development, Massachusetts and Connecticut state certifications. PHA-Web also manages tax credit programs, HQS inspections, and rent reasonableness.
- **Financial Management** – Financial management contains a complete general ledger component designed for asset management and comes with a full reporting section used to create balance sheets, income statements and statements of cash

flow in addition to general ledger and general journal reports. It is used to manage accounts receivable, accounts payable and asset management.

- **Property Management** - Property management collects, stores and manages data about agency buildings and units. This is where work orders are created, materials, inventory and maintenance labor are tracked, and public housing inspections get performed²⁵.

Cost structure

Table C5.4 - Cost structure

Service	Price
PHA-Web Software License This license provides ten (10) Alternatives users with concurrent access to the Work Order Manager and Inspection Manager components of PHA-Web software. Licensing fees are included in the annual support subscription.	Included
Database Setup This is a one-time fee for creating a customized database	\$ 250.00
Data Conversion There is no data conversion for this project.	N/A
Training This price includes up to 4 hours of online PHA-Web training. Additional training is available by the hour	\$ 600.00
Total Setup Expense (one-time fees)	\$ 850.00
PHA-Web Annual Software Support This is the total PHA-Web Software Maintenance and Support Service fee for a one-year subscription.	\$ 1,200.00

²⁵ <http://www.pha-web.com/home/ContentPages/software/>

UI examples

PHA-Web

Demonstration Housing Authority
Welcome: PHA Administrator

- Home
- Logout
- Support Manager
- Tenant Managers
- Waiting List
- Letter
- 50058 Certification
- General Certification
- Family
- Vacated Tenant
- TRACS
- Property Managers
- Rent Reasonableness
- Inspection Manager
- Program
- Work Order
- Accounting Managers
- General Ledger
- HAP Accounting
- PH Accounting
- Portability
- Vendor Accounting
- Administration
- User Manager
- PHA Manager
- Import Legacy Data
- Import TRACS Data
- Import 50058 Data
- Download Data
- Document Imaging
- Contact Manager
- MCS Software Updates
- Order Forms
- Friday Facts
- Company Information

Work Order Information

<p>Alvarez, John PIC Project #000 Site #001 ⚠ 1302 Ave. D (Unit: 1302) Tilden, TX 78072 Ph. 1: N/A Ph. 2: N/A</p> <p>Building N/A</p> <p style="text-align: center;"><input type="button" value="Edit Site"/></p>	<p>Work Order Number: 502 Date/Time Created: 5/17/2012 @ 3:07 PM Date/Time Scheduled: N/A Date/Time Completed: 5/17/2012 @ 4:00 PM Work Order Priority: Routine Permission to Enter: No Work Order Requested By: Tenant Work Order Created By: Gleason, Scott Work Order Assigned To: N/A</p> <p style="text-align: center;"><input type="button" value="Edit Information"/></p>
--	---

Work Order Description

Light bulb in kitchen is out

Tasks

Task	Job Expense	Billed
Description: <input style="width: 80%;" type="text" value="Maintenance"/>	\$12.50	\$0.00
<input type="button" value="Add Task"/>		

✖ Labor	Hrs.	Rate	Labor Total	Billed
Date: <input style="width: 80%;" type="text" value="05/17/2012"/> <input type="button" value="D"/>	0.50	\$25.00	\$12.50	<input style="width: 50%;" type="text"/>
Employee: <input style="width: 80%;" type="text" value="Bessey, Nick"/> <input type="button" value="v"/>				
Type: <input style="width: 80%;" type="text" value="-- Select --"/> <input type="button" value="v"/>				
Totals:				\$0.00

<input type="button" value="Save Work Order"/>	<input type="button" value="Print Field Form"/>	<input type="button" value="Exit"/>
<input type="button" value="Save and Add Work Order"/>	<input type="button" value="Complete Work Order"/>	
<input type="button" value="Save and Add By Family"/>	<input type="button" value="Print Completed Form"/>	
<input type="button" value="Save and Add By This Family"/>		

Copyright 2004 Management Computer Services
IP Address: 68.115.65.162 app2.103

Picture C5.2 – Work Order

PHA-Web
Demonstration
Welcome: PHA Administrator

- Home
- Logout
- Support Manager
- Tenant Managers
- Waiting List
- Letter
- 50058 Certification
- General Certification
- Family
- Vacated Tenant
- TRACS
- Property Managers
- Rent Reasonableness
- Inspection Manager
- Program
- Work Order
- Accounting Managers
- General Ledger
- HAP Accounting
- PH Accounting
- Portability
- Vendor Accounting
- Administration
- User Manager
- PHA Manager
- Import Legacy Data
- Import TRACS Data
- Import 50058 Data
- Download Data
- Document Imaging
- Contact Manager
- MCS Software Updates
- Order Forms
- Friday Facts
- Company Information

PHA-Web Inspection Manager: Abby, Jennifer W

[<< Previous](#)
[General](#)
[Rooms](#)
[Additional Information](#)
[Custom Questions](#)
[Finish](#)
[Next >>](#)

Inspection Information

Form Type
52580

Program Housing Choice Voucher **Project** ACC #001

Type Of Inspection
 Initial
 Interim
 Annual
 Move Out
 Complaint
 Change Unit
 Quality Control
 Reinspection

Inspector
Gleason, Scott

Annual Inspection
 Date: 01/29/2014
 Scheduled Date: 03/13/2014
 Scheduled Time: 10:00 AM
 Actual Date Of Inspection: Actual Time Of Inspection:

Date Of Last Inspection
02/07/2014 **Inspection Status** Incomplete
 Closed Date Of Inspection: Closed Time Of Inspection:

Is A Reinspection Required? No **Number Of Days Until Reinspection**

Family Information

No.	Member	Relation	SSN	Birth Date
01	Abby, Jennifer W	Head	111-99-2558	09/23/1965
02	Abby, Bill	Spouse	111-22-2541	01/01/1965
03	Abby, Steve	Other Youth Under 18	111-22-0953	01/01/2005
04	Abby, Christopher A	Full-Time Student 18+	111-22-6548	01/01/1995

[Add Member](#)

Custom Fields

Requires Special Assistance

Contact Name

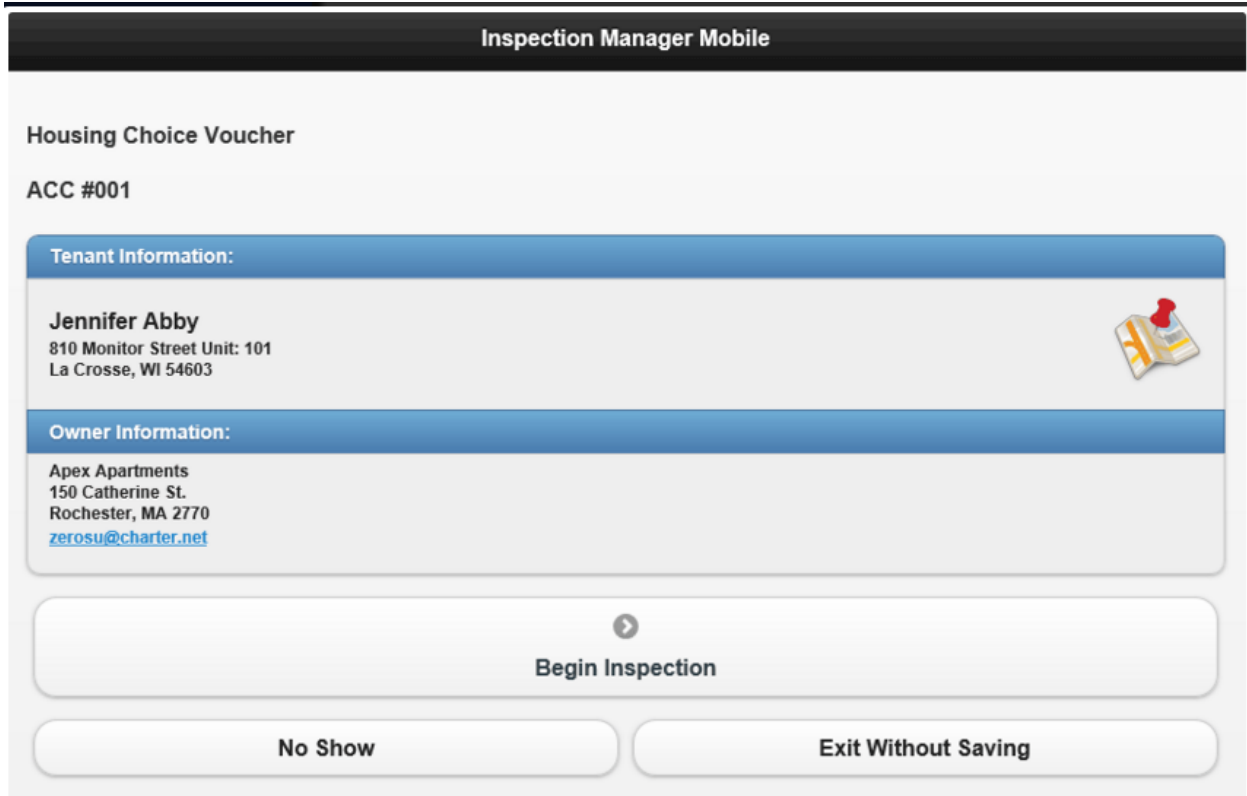
Contact Number

Number Of Children In Family Under Age Six

Primary Phone Number **Secondary Phone Number**

Picture C5.3 – Inspection

Mobile application's UI examples



Picture C5.4 – Inspection

C6: MA CMMS**Requirements**

Importance: H - High; M - Medium; L - Low

Table C6.1 - Functional requirement

Functional requirement	I	MA CMMS
The solution must provide mobile app for, at least, next user-stories:		
• Manage inspections (all user-stories)	H	Yes
• Manage work orders (all user-stories)	H	Yes
• Manage worker's schedule	M	yes
• Inventory	M	yes
The solution must provide an opportunity to attach photos to orders and inspections	M	Yes
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes.
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes. The solution provides a list of reports. There is an opportunity to build report.
The solution must provide an opportunity to prioritize orders.	H	No.
The solution must provide an opportunity to manage of worker's schedule.	M	Yes.
The solution must allow group locations by components, buildings and apartments.	H	Yes.

Table C6.2 - Nonfunctional requirement

Nonfunctional requirement	I	MA CMMS
The application must work fast (The creation of order must take 30 sec or less)	H	Yes.
The interface must be simple and suitable for daily using	H	The interface of the mobile app is simple.

User-stories

Table C6.3 - User-stories

User-story	I	MA CMMS
<u>Authorizing in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> ● Add new user ● Edit user's information ● Manage user's rights ● Delete a user 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> ● Add new item ● Edit item ● Delete item 	H	Yes
<u>Manage inspections</u>		
<ul style="list-style-type: none"> ● Create the inspection 	H	Yes.
<ul style="list-style-type: none"> ● Create multiple recurring inspections 	M	Yes.
<ul style="list-style-type: none"> ● Create a single inspection 	H	Yes.
<ul style="list-style-type: none"> ● Edit the inspection 	H	Yes.
<ul style="list-style-type: none"> ● Delete the inspection 	H	Yes.
<ul style="list-style-type: none"> ● Planning/schedule inspections 	H	Yes.
<ul style="list-style-type: none"> ● Search the inspection 	H	Yes.

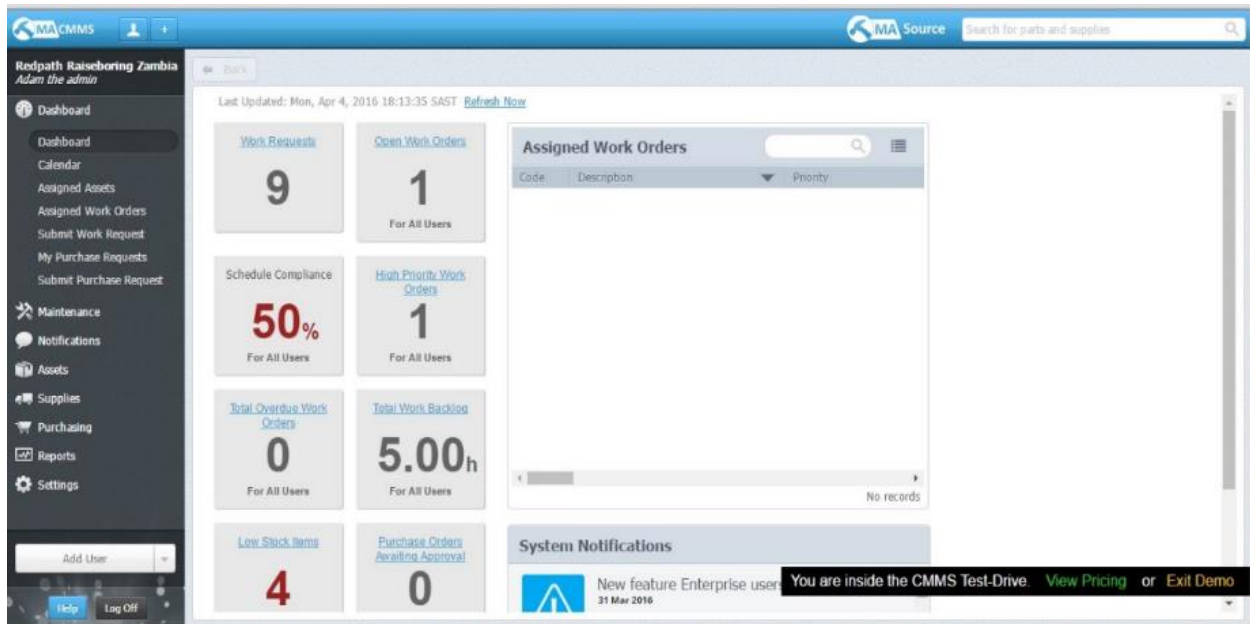
• Conduct the inspection	H	Yes.
• Re-inspection	M	No. You can use the previous one as a template or duplicate it.
<u>Manage work orders</u>		
• Create the work order	H	Yes.
• Create a single work order	H	Yes.
• Create the order by unit	H	Yes.
• Create the order for multiple units	M	No
• Create recurring work order	M	Yes.
• Create the order for multiple units	M	yes
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	No
• Search the work order	H	Yes.
<u>Manage worker's schedule</u>	M	Yes. (including no. of hours worked)
<u>Manage reports</u>		
• Configure report (Alternative is a sufficient list of reports)	H	Yes. The solution provides a list of reports.
• Build report	H	Yes. (depends on the plan chosen)
<u>Manage assets</u>	L	Yes.

<ul style="list-style-type: none"> ● Add assets ● Search assets ● Transfer assets ● Edit assets ● Delete assets 		
<u>Inventory</u> <ul style="list-style-type: none"> ● Add inventory ● Search inventory ● Edit inventory ● Delete inventory 	L	Yes.

Key features

- Trigger maintenance by meter reading or event
- Email alerts when maintenance task is due
- Free interface for guests to request maintenance
- Create and assign work orders
- Mobile access, from any device with a browser
- See real-time status of work orders
- Web-based software: no IT, setup or updating on your end
- See current location of tools and equipment
- 150 reports for analyzing your maintenance operation
- Group users, so they only see notices relevant to their role
- Integrated inventory tracking for parts and supplies
- Attaching pictures.
- Schedule recurring maintenance.

UI examples



Picture C6.1 – Dashboard

C7: ProLease**Requirements**

Importance: H - High; M - Medium; L - Low

Table C7.1 - Functional requirement

Functional requirement	P	ProLease
The solution must provide mobile app for, at least, next user-stories:		
• Manage inspections (all user-stories)	H	No
• Manage work orders (all user-stories)	H	No
• Manage worker's schedule	H	No
• Inventory	H	No
The solution must provide an opportunity to attach photos to orders and inspections	M	No
The solution must provide an instrument for tracking the status of orders (Order must have a workflow with at least three statuses: open, in progress, finished).	H	Yes
The solution must provide a sufficient list of reports or an opportunity to customize reports.	H	Yes
The solution must provide an opportunity to prioritize orders.	H	No
The solution must provide an opportunity to manage of worker's schedule.	M	No.
The solution must allow group locations by components, buildings and apartments.	H	Yes.

Table C7.2 - Nonfunctional requirement

Nonfunctional requirement	P	ProLease
The application must work fast (The creation of order must take 30 sec or less)	H	Yes.
The interface must be simple and suitable for daily using	H	Simple for the web.

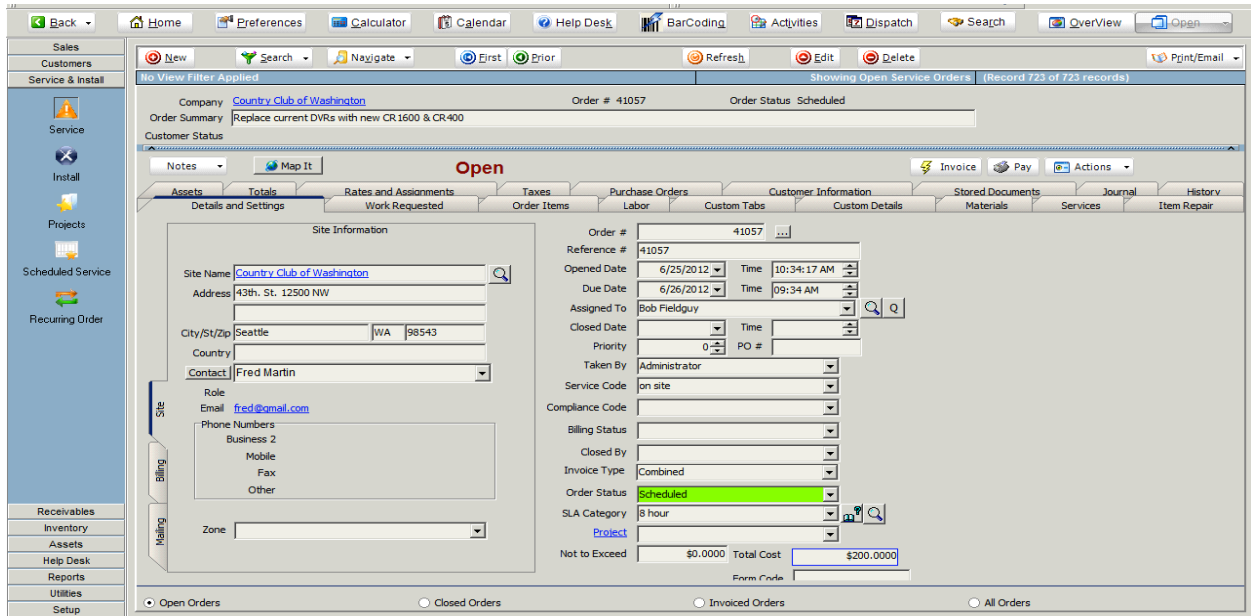
User-stories

Table C7.3 - User-stories

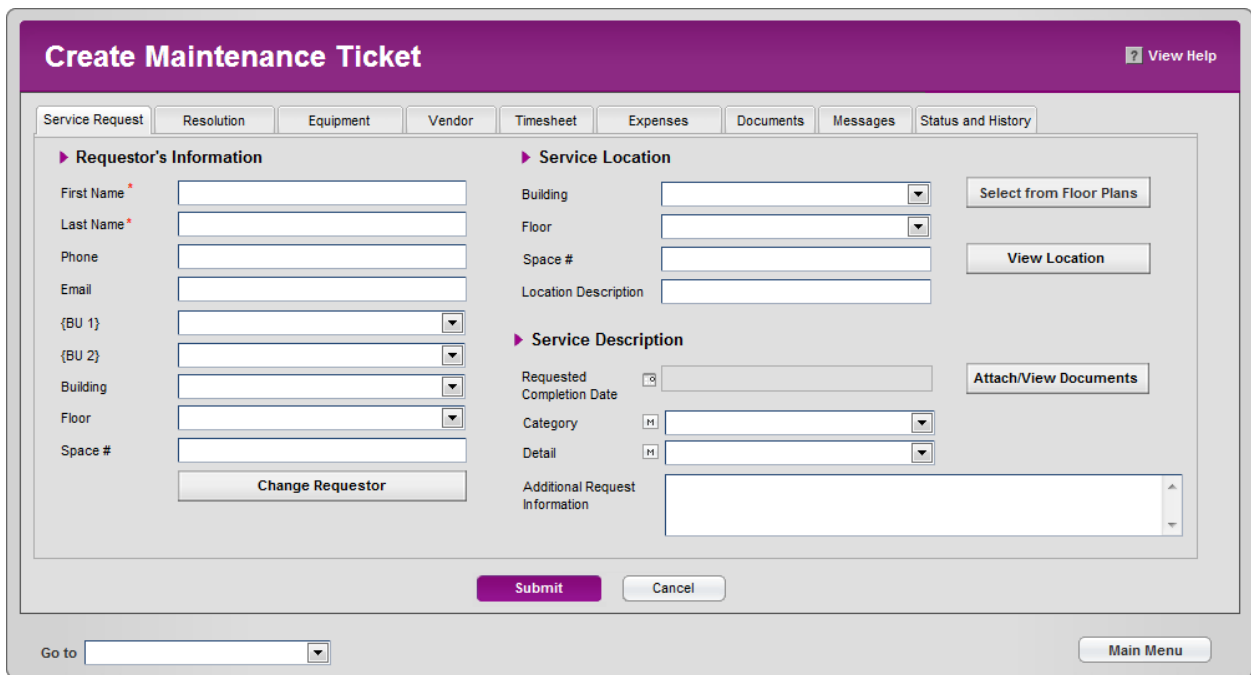
User-story	I	ProLease
<u>Authorize in the system</u>	H	Yes. Login/Password
<u>Manage users</u> <ul style="list-style-type: none"> • Create user • Edit user • Delete user • Manage user's rights 	H	Yes.
<u>Manage terminology</u> <ul style="list-style-type: none"> • Add new item • Edit item • Delete item 	H	Yes.
<u>Manage inspections</u>		
• Create the inspection	H	Yes.
o Create multiple annual inspections	M	Yes.
o Create individual inspection	H	Yes.
• Delete the inspection	H	Yes.
• Planning/schedule inspections	H	Yes.
• Search the inspection	H	Yes.
• Conduct the inspection	H	Yes.

<u>Manage orders</u>		
• Create the work order	H	Yes.
o Create single work order	H	Yes.
o Create recurring work order	M	Yes.
• Edit the work order	H	Yes.
• Assign the work order	H	Yes.
• Complete the work order	H	Yes.
• Delete the work order	H	Yes.
• Verify of executed work order	H	No.
• Search the work order	H	Yes.
<u>Manage worker's schedule</u>	M	No.
<u>Manage reports</u>		
• Configure report	H	Yes. Depending on required format.
• Build report	M	Yes. 90 reports available
<u>Manage assets</u>	L	No.
• Add assets		
• Search assets		
• Transfer assets		
• Edit assets		
• Delete assets		

UI examples



Picture C7.1 – Work order creation



Picture C7.2 – Maintenance ticket request

APPENDIX D: ANALYSIS

D1: Functionality fullness comparison

For functionality fullness comparison we've calculated the percentage of each solution functionality from required functionality and multiply results by a coefficient which shows the importance of this functionality. We've taken critical user-stories and processes:

- Inspection management (all included user-stories)
- Work order management (all included user-stories)
- Worker's schedule management
- Data migration
- Reports (an opportunity to build and configure new reports)
- Mobile app functionality (Work orders, Inspections, Worker's schedule and Inventory)

According to requirements, each user-story has the level of importance (High, Medium, Low). We've implemented coefficient for each level (3, 2, 1) for showing the weight of each user story.

In the following table:

- Yellow columns:
 - 1 means "Yes" - a solution meets this requirement;
 - 0 means "No" - a solution doesn't meet this requirement;
- White columns - service columns.
- Green rows - the result - the percentage of each solution functionality from required functionality.

Table D1.1 - Calculation of percentage

Functionality	Coefficient	Hippo CMMS	Fleetmatics	Rentec Direct
Inspection management				
Create the inspection	3	1	1	1
Create multiple recurring inspections	2	1	1	1
Create a single inspection	3	1	1	1

Edit the inspection	3	1	3	1	3	1	3
Delete the inspection	3	1	3	1	3	1	3
Planning/schedule inspections	3	1	3	1	3	1	3
Search the inspection	3	1	3	1	3	1	3
Conduct the inspection	3	1	3	1	3	1	3
Re-inspection	2	0	0	0	0	0	0
Percentage		0.92		0.92		0.92	
Work order management							
Create the work order	3	1	3	1	3	1	3
Create a single work order	3	1	3	1	3	1	3
Create the order by unit	3	1	3	1	3	1	3
Create the order for multiple units	2	1	2	0	0	0	0
Create recurring work order	2	1	2	1	2	1	2
Create the order for multiple units	2	0	0	0	0	0	0
Edit the work order	3	1	3	1	3	1	3
Assign the work order	3	1	3	1	3	1	3
Complete the work order	3	1	3	1	3	1	3
Delete the work order	3	1	3	1	3	1	3
Verify of executed work order	3	1	3	1	3	0	0
Search the work order	3	1	3	1	3	1	3
Percentage		0.94		0.88		0.79	
Worker's schedule management							

Worker's schedule management	2	1	2	1	2	0	0
Percentage		1.00		1.00		0.00	
Data migration							
Data migration	3	1	3	1	3		0
Percentage		1.00		1.00		0.00	
Reports							
The list of existing reports	2	1	2	1	2	1	2
An opportunity to configure new report	3	1	3	1	3	1	3
Build report - Excel	3	1	3	1	3	1	3
Build report - Pdf	2	1	2	1	2	1	2
Percentage		1		1		1	
Mobile app functionality							
Create inspection	3	1	3	1	3	1	3
Conduct inspection	3	1	3	1	3	1	3
Create work order	3	1	3	1	3	1	3
Close work order	3	1	3	1	3	1	3
Manage worker's schedule	2	1	2	0	0	0	0
Inventory	2	1	2	0	0	0	0
An opportunity to attach photos	2	1	2	1	2	0	0
Percentage		1.00		0.78		0.67	

Based on results, we've created a final table where we've collected all values, multiplied them by importance coefficient, and calculated the final sum for each solution.

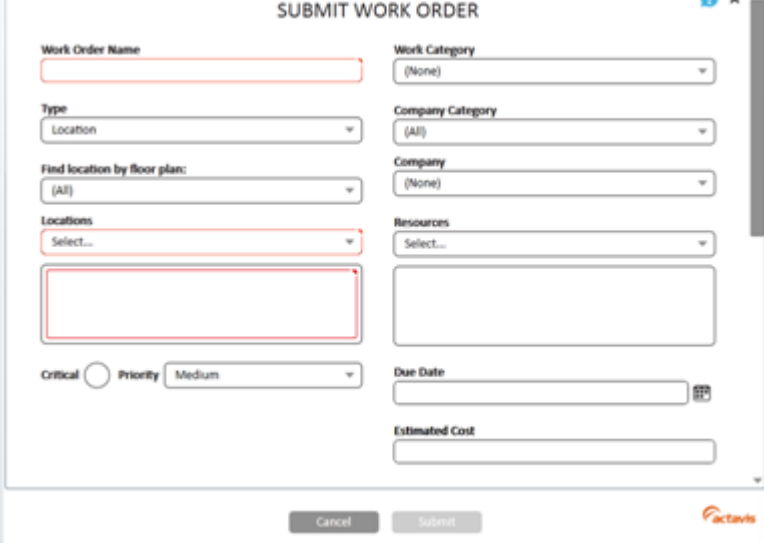
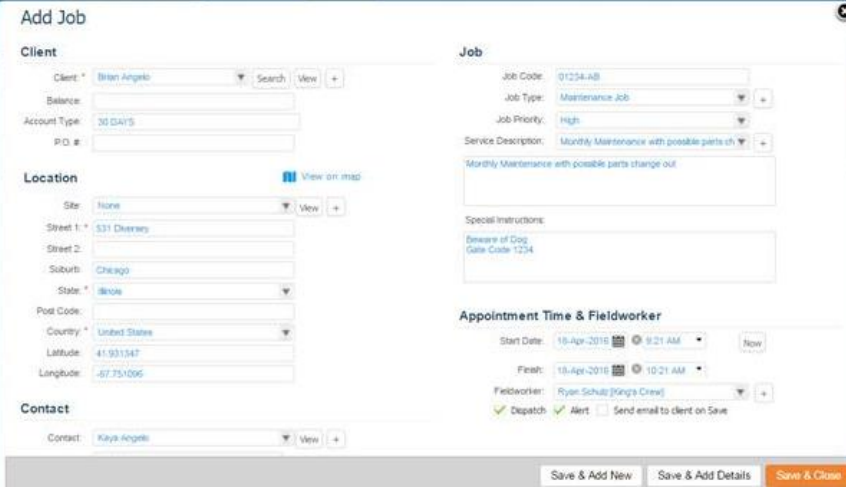
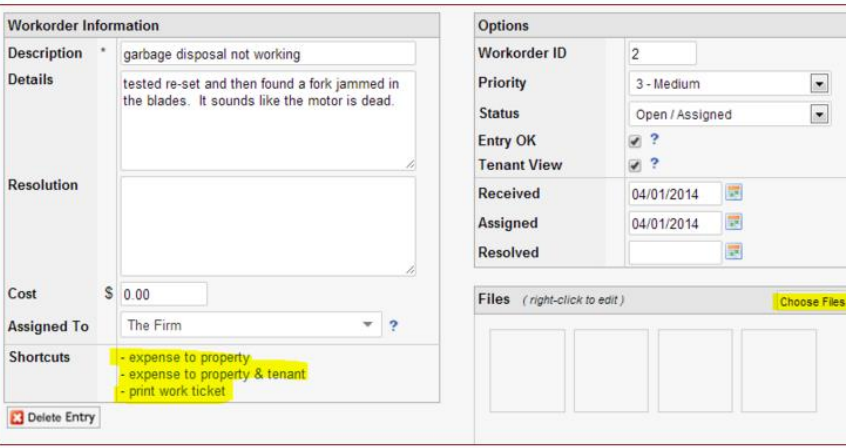
Now it is very easy to compare these sums with full sum - 16:

Table D1.2 - Final table

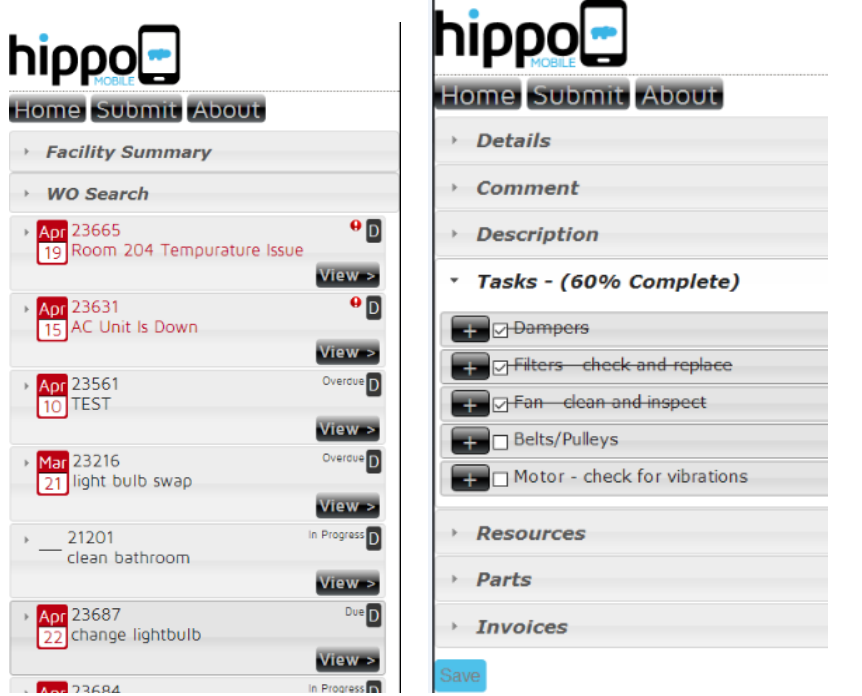
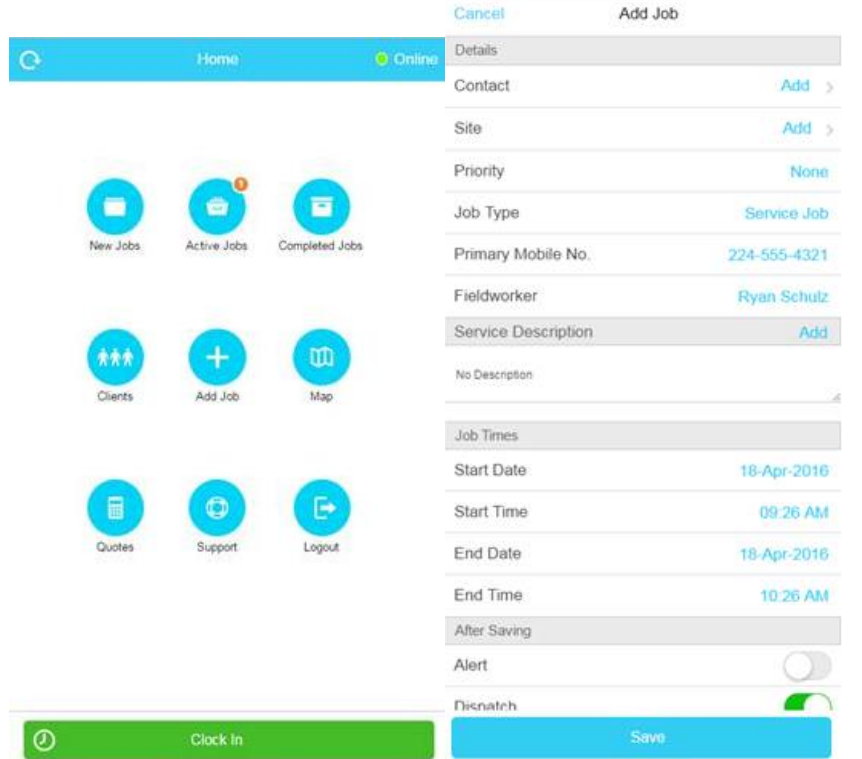
Functionality	Importance	Coefficient	Hippo CMMS	Fleetmatics	Rentec Direct
Inspection management	High	3	0.92	0.92	0.92
Work order management	High	3	0.94	0.88	0.79
Worker's schedule management	Medium	2	1.00	1.00	0.00
Data migration	Medium	2	1.00	1.00	0.00
Reports	High	3	1.00	1.00	1.00
Mobile app functionality	High	3	1.00	0.78	0.67
Sum		16	15.58	14.73	10.12

D2: Users Interface comparison

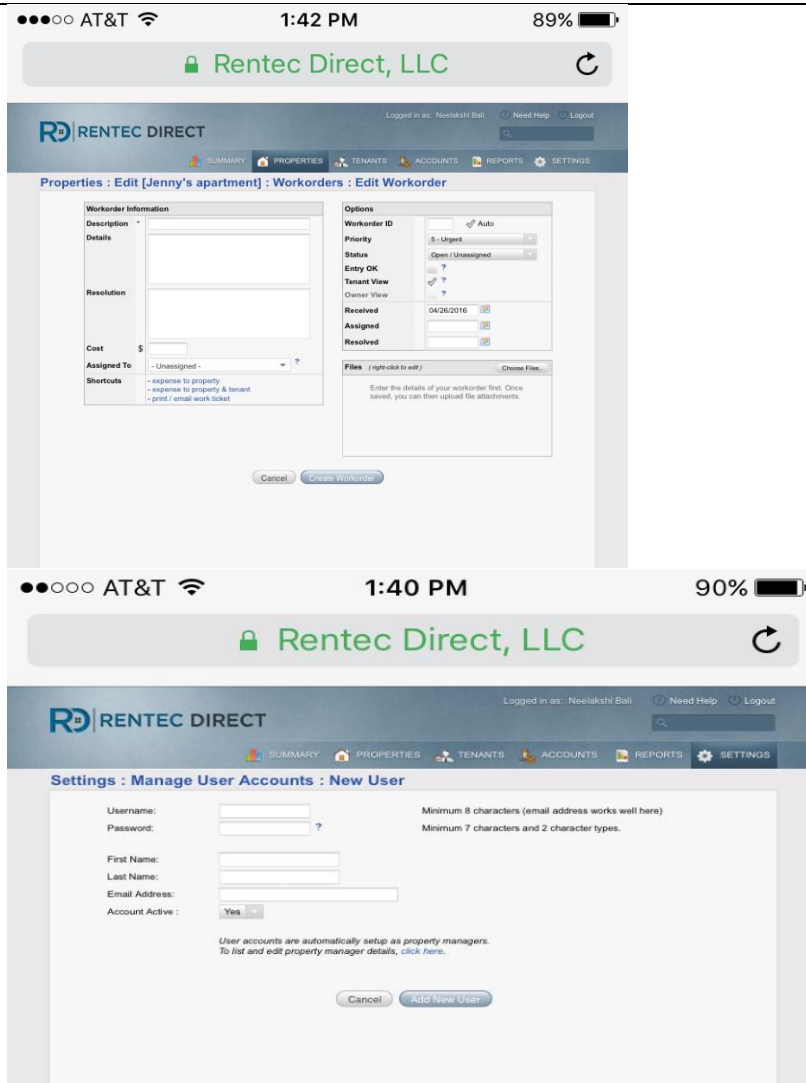
Web interface (Work order creation)

Application	UI	Description
Hippo		<p>The interface looks pretty simple.</p> <p>Fields are large enough.</p> <p>All requirement fields are highlighted.</p> <p>Majority of fields has drop-down type</p>
Fleetmatics		<p>The interface does not look simple.</p> <p>There are a lot of fields, and the size of fields is small.</p> <p>All requirement fields are marked.</p> <p>The majority of fields has drop-down type.</p>
Rentec Direct		<p>The interface looks pretty simple.</p> <p>All requirement fields are marked.</p> <p>The majority of fields has a blank type.</p>

Mobile interface

Application	UI	Description
<p>Hippo</p>		<p>The application has a very simple start page, which allows the user to see all his planned works.</p> <p>The interface of adding Job process also looks simple and intuitive.</p> <p>All buttons and fields are adapted for mobile devices.</p> <p>The design of the application looks out of date.</p>
<p>Fleetmatics</p>		<p>The application has a very simple start page, which allows the user to choose next action.</p> <p>The interface of adding Job process also looks simple and intuitive.</p> <p>All buttons and fields are adapted for mobile devices.</p> <p>The design of the application is very nice and modern.</p>

Rentec
Direct



The mobile version of the website is not adapted to mobile device properly.

All fields are very small, and it will be difficult to fill it.