SWE410 Software Processes

Individual Project: Software Project Management & Methodology

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# Section 1: Project Goals and Scope

Market Smart (Email Marketing Company)

* Market Smart provides an email marketing solution for marketers big and small. Market Smart will provide a web application that allows users to both create emails and track the email campaign’s metrics in real time.   
    
  In a world of subscription based SASS products, and marketing shifting from print to screen, Market Smart helps provide a platform for teams of all sizes to take advantage.  
    
  One of the most attractive aspects of Market Smart is how it allows smaller businesses on smaller budgets take advantage of premium marketing methods and designs.
* Features of Market Smart include:
  + Email Editing and Creation
  + Contact List Management
  + Response Metrics (opens, deliveries, bounces, etc.)
  + Team capabilities with multiple username setups.

# Section 2: Project Management Process

## Planning

To better manage scope during development of Market Smart, we are focusing on our core four features to begin and working out from there. These features can be found on page 3 of this document. We will have small teams dedicated to each area of the application, with email creation having a slightly larger team to begin with.

We expect full development of the core application to take place over 6 months. This timeline will be shared with our development teams and monitored as development continues. Any changes to timeline will be actively communicated with stakeholders as soon as possible.

**Potential Risks**

* Too Broad of Scope:
  + We will combat re-scoping mid-project by being extremely realistic during the planning phase. Both timeline and budgets have been calculated conservatively, yet reasonable. Any changes, or foreseen changes will be communicated with stakeholders immediately.
* Past Scheduled Timeline:
  + Timeliness will be ensured by realistic schedules for working employees. We will monitor closely for scope changes, mentioned in the first part of this section, and needs of the staff. Human elements such as motivation, understanding, and balance will be considered here as well.
* Privacy Complications:
  + To avoid interfering with scope, timeline, or legalities we will have our legal team perform due diligence in helping us remain compliant major privacy and compliance laws. These can include the CAN-SPAM1 act for the US. CASL2 for Canadian customers, and the recent GDPR3 legislation for the EU.

## Executing

**Key Deliverables:**

1. Project Schedule:
   1. This shall include a full working schedule from start to finish for Market Smart.
   2. This shall include all major development points of project including closure.
   3. Project schedule shall be amended during the development life cycle if necessary.
2. Project Budget:
   1. The project budget shall include all facets of product development, including vendor and third party relationships.
   2. All major stakeholders before finalization shall agree upon budget.
   3. If budget is exceeded, this shall be communicated with stakeholders immediately.
3. Monitoring and Status Reports
   1. Updates shall be reported once every month at minimum.
   2. Status reports shall include references to budget as it relates to the entirety of scope, as well as development progress in terms of schedule.
4. The customer’s governance will be moderate, opting for occasional status reports detail in section three of Key Deliverables.
5. Our customer desires insight on the progress of development both to help communicate to common stakeholders, and to be able to better plan from a business perspective.
6. Examples of items needing governance include:
   1. Status Reports
   2. Scope and Budget reports
   3. Major feature decisions or changes

Examples of items **not** needing governance include:

1. Disciplinary decisions for staff
2. Human resource related requests for staff
3. Working environment requests or changes.

## Monitoring and control

Monitoring and control will occur through out the project’s lifecycle. This includes status reports for all stakeholders monthly, and analysis for **major** stakeholders and our project managers.

Analysis reports will include:

* Current working progress of project.
* Current budget spent on project.
* Any major changes that have occurred in the past week, and past month.
* Perceived flaws or foreseen changes to scope.
* Current bugs, issues, and challenges.

# Section 3: Requirements Management (REQM)

## CMMI Practice Area / ISO 12207:

* Utilizing the layout provided by cmmi-training.com, we can see how a framework helps provide guidelines to **any** teams. This is introduced in this documentation prefaced with three types of processes 4:
  + Basic
  + Support
  + Organizational
* These types of processes help provide a lens to better understand the sub sections.
* With requirements management being a very sprawling topic, it can be easy to forget a step or miss a crucial need even for the most seasoned of project managers. This helps provide a complete wireframe for creating a project.
* It is worth noting that this can be particularly crucial for Market Smart considering the legal implications as a data processor and a data controller. This in combination with compliance laws makes for a very necessary planning period.

## CMMI Action Items:

### Project Commitment

Referencing SP 1.2 on Software-Quality-Assurance.org, “When integrated teams are formed, the project participants are the integrated teams and their members. Commitment to the requirement for interacting with other integrated teams is as important for each integrated team as its commitments to product and other project requirements.” 5.

This provides a clear action item to execute on. Gaining buy in throughout the team during Market Smart’s production will result in increased efficiency, innovation, and control. This can be performed by well communicating goals and expectations.

### Identifying Inconsistencies

Part of following requirements and bridging the gap between earlier stages of CMMI and closing stages, is ensuring project development accurately. Sub practices are described as:

* Subpractice: 1 Review the project’s plans, activities, and work products for consistency with the requirements and the changes made to them.
* Subpractice: 2 identify the source of the inconsistency and the rationale.
* Subpractice: 3 Identify changes that need to be made to the plans and work products resulting from changes to the requirements baseline.
* Subpractice: 4 Initiate corrective actions. 5

These granular practices help us produce deliverables and then take next steps on them. After practice 3, we can create a changes sheet and follow up with the source of the issue. By practice 4 we are executing on necessary changes. In terms of accuracy, this will help us ensure that Market Smart is developed in scope and as expected.

# Section 4: Process and Product Quality Assurance (PPQA)

## PPQA Summary

* The practice area laid out for PPQA, is meant to provide both a why and a how to process and product quality assurance. Ensuring the processes put in place are just as sound as the product is can be the difference between a good and bad project timeline.  
    
  The process of PPQA is expanded upon in software-quality-assurance.org’s page as, “The practices in the Process and Product Quality Assurance process area ensure that planned processes are implemented, while the practices in the Verification process area ensure that the specified requirements are satisfied. These two process areas may on occasion address the same work product but from different perspectives. Projects should take advantage of the overlap in order to minimize duplication of effort while taking care to maintain the separate perspectives.”  
    
  This passage highlights efficiency, and effectiveness at the same time.

## CMMI Action Items:

### Evaluate Processes:

The top priority for PPQA for Market Smart is to evaluate, objectively, the processes put in place. Market Smart employees will have a way to create, promote, and edit processes put in place in a central platform. All Market Smart (MS) employees will have access to this platform to help promote commitment from the team detailed in [section 3](#_Section_3:_Requirements).

Part of this platform will require users to log time and link it to a particular process. This will help to track average efficiency of any given process as well as improvements over time.

### Training

Market Smart will require fully trained developers in quality assurance. Comprehensive skills are suggested in SQA’s GP 2.5 5

* Application domain
* Customer relations
* Process descriptions, standards, procedures, and methods for the project
* Quality assurance objectives, process descriptions, standards, procedures, methods, and tools

Market Smart will require industry specific knowledge as well. This includes:

* Legal domain in data retention and processing.
* Marketing practices with data intake.

# Section 5: Software Development Methodology

## Summary

Scrum, in short, is agile methodology. This is summed up in Mountain Goat Software’s page by saying, “In the agile Scrum world, instead of providing complete, detailed descriptions of how everything is to be done on a project, much of it is left up to the Scrum software development team. This is because the team will know best how to solve the problem they are presented.

This is why in Scrum development, for example, a sprint planning meeting is described in terms of the desired outcome (a commitment to a set of features to be developed in the next sprint) instead of a set of Entry criteria, Task definitions, Validation criteria, Exit criteria (ETVX) and so on, as would be provided in most methodologies.” 6

This will fit into Market Smart’s agile structure, and allow us to quickly iterate and pivot as needed. Because the marketing world is a quick moving one with many changes, this will be largely contribute to our ongoing success.

## Features

One area in which it is effective at promoting quality is by gathering developer buy in by design. One of the inherent ways sprints are planned is in scrum meetings. Much of the back and forth and goal setting is established by the team. This is utilized in combination with user stories that help describe a why with a feature set.

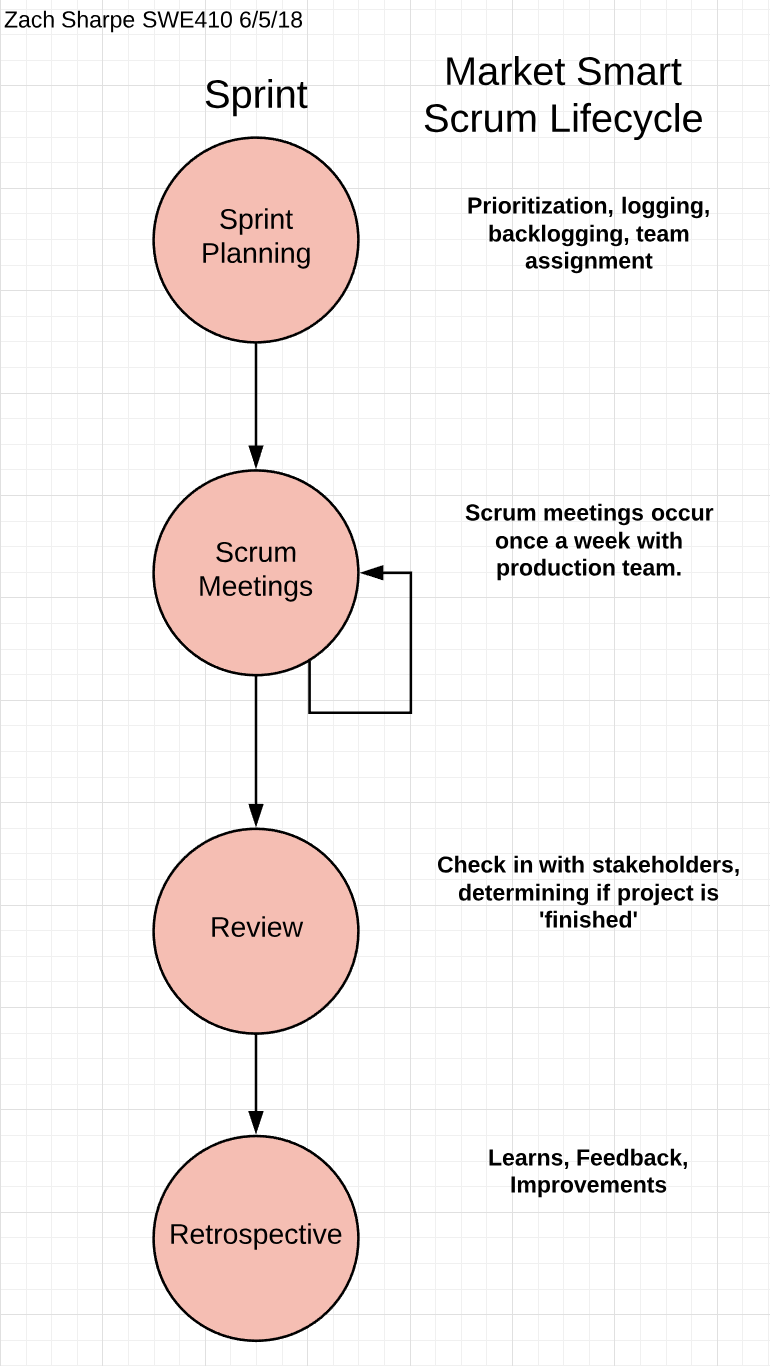
Another attractive aspect of scrum is the effectiveness of scrum teams. Development is not allocated based purely on skillset, “The third and final role in Scrum project management is the Scrum team itself. Although individuals may join the team with various job titles, in Scrum, those titles are insignificant. Scrum methodology states that each person contributes in whatever way they can to complete the work of each sprint.” 6

## Key Parts

The following diagram provides visual representation of a sprint lifecycle using scrum methodology. This flow will be repeated numerous times and is improved upon using the retrospective processes set in place. Using Mountain Goat Software’s particular take on retrospective, “Although there are many ways to conduct an agile sprint retrospective, our recommendation is to conduct it as a start-stop-continue meeting. This is perhaps the simplest, but often the most effective way to conduct a retrospective. Using this approach each team member is asked to identify specific things that the team should:

* Start doing
* Stop doing
* Continue doing” 6

The full diagram can be viewed [here](https://www.lucidchart.com/invitations/accept/3b65b4e0-be6b-4202-b097-7f056d34abc8).



## Potential Risks

There are several flipsides to Scrum methodology. One of these is its *dependency* on voluntary participation. This can be a tricky line to tow as a scrum master, but it is important to have bought in from the entire scrum. One employee’s refusal to participate or distaste, can sour an entire scrum. This can sometimes be remedied with scrum or agile ‘games’. To help counter this potential pitfall, we will require team members to come up with Scrum games on a weekly basis. This will increase buy in and ownership across the board.

Consistency with Scrum methodology can be necessary to a fault. Scrum meetings (quick meetings no longer than 15 minutes), are short, but important to follow through with. Many teams have tried this and since defaulted to Slack meetings or skipping in person Scrum meetings. This can defeat the whole purpose of a tight knit, communicative group. To combat this Market Smart will plan several months out in advance for all Scrum meetings. These will also be required of all engineers.

# Section 6: Standards

|  |  |
| --- | --- |
| **Activities to Promote Quality** | **Description** |
| Incremental Scope Review | Project scope will be evaluated based on current work completed and any amendments put in place since. This helps combat scope ‘creep’ throughout the project. |
| Scrum Meetings | 15 minute, fast meetings, daily. This promotes quality through communication. |
| Commitment to Requirements | Will be done by assessing how requirement are affecting current workflows and processes. Also done by documenting commitments. |
| Peer Reviewed Releases | Any push to code, feature implementations, or product releases related to Market Smart will be peer reviewed by another developer for quality assurance. This is alignment with verification practices as part of CMMI. |
| Pair Programming | Pair programming serves as a way to promote growth **and** quality in the current project. This expands our teams knowledge and allows a pseudo in-the-moment peer review. This is in alignment with verification practices in CMMI. |
| Select Product Component Solutions 5 | “Sub practice 1: Evaluate each alternative solution/set of solutions against the selection criteria established in the context of the operating concepts and scenarios.   Develop timeline scenarios for product operation and user interaction for each alternative solution. “ 5  This allows a “drafting” period to ensure we’re choosing the most effective technical solution. |
| Structural Software Design Methodology | We will be selecting an object oriented programming language for Market Smart to promote reuse and database accessibility. This works best when implementing contact management features for email marketing. |

# Section 7: Project Quality

* Project quality will be assessed for Market Smart at the beginning and end of each sprint. Below will be project processes that are related to project quality. These will be divided between beginning and end.

### Pre Sprint Processes

* + Project Plan Review
    - The project manager reviews the project plan. This relies heavily on **verification,** and expects **validation** to be completed outside of sprint cycle by PM and immediate stakeholders
  + Sprint Schedule Review
    - A senior developer or project manager signs off timing, scheduling, and estimations.
  + Respective Team Makeup:
    - Our hope for team makeup is that team members perform duties that contribute to the success of the project despite specialization: “The Agile approach fosters collaborative and proactive behaviors by team members: test, development, product owners, etc. Everyone is responsible for the eventual quality of the product, everyone has ownership.” 7
    - With the above point in mind, we’ll be creating semi-dedicated teams around language and feature when the need arises. This will be reviewed at the beginning of the sprint.
  + Requirements Signoff
    - Final approval of requirements entering sprint production.

### Post Sprint Processes

* + Peer Reviews
    - Borrowing from Daitan Group’s summary of QA in an agile environment: “Additional improvement in quality can be achieved by simple and common techniques, such as peer reviews.” 7  
        
      This is a necessary practice to ensure working code is being pushed out to a production environment.
    - Release Signoff
  + Post-Mortem Review
    - The entire development team involved in related sprint performs this. This includes the engineering manager, team, and project manager.
  + Ongoing Semi-Dedicated Team Shifts
    - Team member shifts may be contingent upon performance, exposure, and growth.
    - Engineering managers perform this only.

# Section 8: Product Quality

## Product Testing:

* Market Smart’s quality testing will include all testing stages, including post-mortem testing. Because Market Smart is a SaaS company, we are careful to iterate quality testing before, during, and after development, as there is no end point for the product.
* Testing will cover 100% of the application, and will be a hard requirement for ongoing development.

## Phases of testing:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Phase** | **Description** | **Team** | **Deliverables** | **Goals** |
| **Unit** | “Unit testing is testing small pieces of the software referred to as *units*. The individual units of software are eventually combined to make up the entire application. Units can be as small as functions or class methods and are sometimes as large as entire modules or classes. Unit testing employs several specific types of testing to identify defects and potential problems in the software before development has proceeded to the point where correction of the defects would be difficult.” 8 | Project Development Team | 100% Source Code Coverage with Passing Unit Tests | Reduce systematic bugs, errors, runtime errors, and other inconsistencies before release or during development. |
| **Integration** | Testing to reduce issue in interacting with dependent systems, external and internal. | Project Development Team / Black Box Testing Members | Successful ‘black box’ runtime of full application. | To test at a higher-level scope, after ensuring modules are covered via unit testing. |
| **System** | System testing will include testing the entire application as a whole. This can involve external teams heavily. This is an *entire* system test compared to integration being 2 modules testing together. | Development Team / Project Manager | Successful runtime test script provided to direct stakeholders. | This ensures a working ‘whole’ picture. |
| **Acceptance** | Acceptance testing can be considered a ‘mass’ test to ensure it is ready for release. Market Smart will release a small internal Alpha. | All Stakeholders | Gathered Feedback Collected & Delivered | Test in a controlled release environment to source feedback and potential issues. |
| **Usability** | Usability testing will take form of beta releases for Market Smart. This includes observance and external candidates. | All Stakeholders / Small External Candidates | Gathered Feedback Collected & Delivered | Testing with an external audience that less knowledge and different perspective on the project at hand. All feedback here is considered and may inform the next sprint cycle. |

**Section 9: Quality Checklist**

The quality checklist below details deliverables ensuring proper communication, development quality, and thoroughness throughout all stages of development. Use the ‘phase’ column to refer to which phase this deliverable is relative to, the deliverable name and description to refer to what the deliverable is and how it assists in quality, and the description of quality deliverable.

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Deliverable Name** | **Description** | **Description of Quality** |
| Requirements | Requirements Documentation | Minimum application structure and features expected by all major stakeholders. This will serve as a verification point throughout the project. | 3-4 Requirements minimum. Very specific, tangible, and measurable requirements. |
| Requirements | Requirements Verification | “The deliverable of **Requirements Verification** is a formal acceptance by the users that all requirements have been met. User acceptance must be both documented and approved. The business users' participation in reviewing, testing, and verifying the product is the best assurance of the success of Requirements Verification. Key contributing factors include early and sufficient user involvement in the requirement processes.” 9 | Signed requirements verification documentation. |
| Design | Design Document | A working timeline of teams, work to be done, and how this relates to the requirements of the project. | Initial timeline of project design milestones |
| Design | UI Mockups | UI Mockups will define look and feel of the Market Smart application. Design will not be beholden to the mockups, but mockups are required at the beginning of design. | UI Mockup for each major site feature in Market Smart at beginning of design, signed by Project Manager |
| Design | User Navigation Flow Chart | A functional pairing to the UI mockups, user flow charts will display the user navigation and desired experience. | 1 Flow chart developed to UML2.0 standards displaying user navigation signed by Project Manager. |
| Development | Milestone Reports | Major status reports communicating the progress of development for Market Smart. This provides transparency to major stakeholders during the development process | Milestone report once every 2 months detailing tangible progress on app. |
| Development | Test Data | For development team use, historical test data to ensure quality of Market Smart | Archived test data as system testing is happening. |
| Development | User Manual | A user manual will be developed along side Market Smart to, at a basis, provide a laymen’s guide to navigating Market Smart. | Detailed walkthrough steps for each major feature in the Market Smart application. |
| Testing | QA Proof of Testing | Documentation that displays testing has been done on all major sections of the application. This refers specifically to white-box testing. | Successful test results for every module that make up the Market Smart application |
| Support | Emergency Guide | Senior development will create an ‘emergency’ guide detailing what needs to be done to completely redeploy the application should something app-wide occur causing usability of Market Smart. | One, verbose, guide to redeploying Market Smart. |

**Section 10: Maintenance and Support**

### Change Process FlowMacintosh HD:Users:zachsharpe:Library:Mobile Documents:com~apple~CloudDocs:CTU:Software Processes:Week 5:Screen Shot 2018-06-19 at 7.00.37 PM.png

### Ongoing Release Schedule

Post release sprints will be categorized simply by their feature area name and will last 30 days per sprint. Market Smart’s post release sprints will be scheduled as the following:

CONTACTS1: Add segmentation logic to target list members that fit a specific selection of criteria. 6/1/18 – 6/30/18

CAMPAIGNS1: Enhanced delivery authentication control for main user. Includes changing of DKIM and SPF records from within Market Smart application. 6/1/18 – 6/30/18

RESPONSE1: Bulk response metric mailing compare. This implements exporting and analytic features of more than one mailing at a time. 6/1/18 – 6/30/18

CAMPAIGNS2: Add dynamic capabilities to Market Smart emails that include specific contact information. Work contingent on tangent work in CONTACTS1 sprint. 7/1/18 – 7/31/18

**Ongoing User Support:**

Support for the end user will be a resource center for Market Smart. This will be in addition to the user manual detailed in the deliverables for section 9 of this documentation. Contracted technical writers will write the resource center.

Support philosophy for Market Smart will initially be self-help documentation and grow into email only support. This allows us to control development costs while providing support to end-users in the early stages of Market Smart.

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