Kaea-Cola Project Estimates, Resource Plan & Schedule

SE 638-001 - Assignment 2 - Fall 2018

Group Members

|  |  |
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# Who Did What

|  |  |
| --- | --- |
| Members | Responsibilities |
| All members | Discussion, planning, and review Activity Scenario Analysis  Resource Table |
| Amjad Alghamdi | Phase I Resource table research |
| Emily Johnson | Pre-Development Activities MS Project plan integration, scheduling risks, project schedule summary |
| Kavya Kumar | Phase II  Appendix 2 Phase II |
| Adetayo Olowu | Phase III |

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# Introduction

Kaea-Cola Inc.is a beverage company that includes 25 business units in different countries including the head office for the African region, which is based in Egypt. We are currently experiencing a number of problems that are impairing our ability to adequately analyze current sales and manage our inventory. We can address many of these problems by improving communication between business units and headquarters, and between business units and our suppliers and customers. Rather than have our employees perform duplicative work re-creating reports based on data that we have already collected elsewhere, we propose an integrated system that will collect data we have already entered and use it to make the work of different business units easier and more responsive to changes in market conditions.

- (Kumar, Johnson, Olowu, & Alghamdi, 2018b).

Particular challenges for this project that we must address include implementing a project across a large, multinational, multilingual company, and that many of our stakeholders may be unfamiliar with or distrustful of the technology that we plan to introduce.

# 1. Revising the Work Breakdown Structure

For this assignment, we revised the task-level work breakdown structure that we created in our last assignment (Kumar, Johnson, Olowu, & Alghamdi, 2018b). The full text of the revised WBS is available in Appendix 1 - Detailed Activity-Level Work Breakdown Structure. Below, we will discuss some of our decisions in adding activities to the WBS.

## Pre-Development Activities

The entire pre-development activities section was added to our revised WBS, including activities aimed at requirements gathering and project planning.

### Business Analysis

We decided to have a business analysis phase where we meet with current employees and managers to observe how they work and identify the business process changes required, and then a separate phase for investigating stakeholder requirements that includes application design workshops for each of the phases.  Since the business analysis involves observing people where they work across several different countries, we split this section into five separate tasks so that we can take small teams (or a few key analysts, if necessary), and have them go to different regions and locations to observe.

To accommodate this, we needed to set up two meetings between all of the observation team members — one is a checkin meeting that will allow the members to discuss what they are seeing so far and highlight any areas that they think merit further attention, and the other is a wrapup meeting wherein the team members will compare notes with each other and produce their recommendations.  (Overall, this will take more employee-hours, but will save us travel costs and will help us complete the business analysis phase in fewer days, helping us to get started as quickly as possible.)

### Requirements Gathering and Application Design Workshops

For the application design workshop, since management and reporting are very important to the business and the proposed system, we set up two workshops for them: one to gather the initial requirements for what they need to see reported upon, before the other workshops are conducted, and one after all of the other workshops are conducted, to verify the requirements after we have a sense of what the other areas need.  All of the other workshop areas are grouped by function.

### Additional Tasks

We also set up additional tasks for researching the currency exchange API and the fax-to-email systems that we expressed interest in within the project proposal.

## Phase I

* Client App: Integrated user-navigation/access
  + Software requirements analysis
  + Requirements gathering
  + Requirements analysis phase
  + Software design & code
  + Module documentation and acceptance test
* Subsystem/component integration test & documentation

In Phase I, for the integrated user-navigation/access, we split out the software requirements analysis to requirement gathering and requirement analysis phase because it will take a long time when they gather requirements and analyze it.

The following components were added to the task level WBS for Phase II activities:

## Phase II

* Phase II change management
  + Business process changes
  + Training in new work procedures
  + User system training
* New process & systems evaluation
  + Phase II systems installation
  + Phase II pilot study
  + Phase II user evaluation
  + Evaluation feedback and client review
* Project Review (Stagegate)
  + Stagegate (project plan) review for Phase II
  + Agreement of client issues to be remedied in Phase II
  + Client approval and signoff for Phase II

**Phase II change Management:** This task involves analyzing the changes in the business processes. This is one of the major elements in developing and implementing a new strategy. Once the process is changed, training is essential to adapt to the new work procedures. Apart from training with respect to new work procedures, training resources for users are also included.

**New Process and System evaluation:** This task includes evaluating the performance of a complete system developed in phase II to discover how it is likely to meet the business requirements. Pilot study is essential, an experiment that enables the organization to learn how the system works in practice. Learning how the users perceive the system and the feedbacks and reviews are documented.

Project Review: This task identifies the current state of the project. In case there exists client issues, they need to be addressed in this task and the client approval is required to proceed to the next phase.

## Phase III

For phase III activities, we included a kick-off meeting to analyse the lessons learned from the previous phases and review changes to the hardware and software requirements. Following this, we included redesign, coding and testing of phase II components.

Some major components such as operations management and reporting, order processing and invoicing depend on the currency prediction and conversion system. Hence, we included a review, test and sign-off of the integration with the currency conversion API.

As part of the delivery for phase III, we included activities for change management, process and systems evaluation, stage-gate and project closure. Some of the activities include business process change, training, system installation, pilot test, formal acceptance, to mention a few.

# 2. Activity Scenario Analysis

## Pre-Development Activities

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity** | **Resources Required** | **Evaluation Criteria** | **Risks Relating To Specific Activities** |
| *Perform Business Analysis:*  Analyze business process changes required, with current employees and managers. | Define a Business Analyst who will look at changes in the processes.  Documentation specialist. | Measuring the satisfaction of management and customer.  Do the solutions we deliver are acceptable? | Users may not understand the new process works. |
| *Investigate stakeholder requirements for software components*. | System analyst | Do users understand what is being proposed? | The system may need training resources for the users to understand how the system works.  Incomplete or missed requirements.  Stakeholders may not know what the requirements are |
| *Perform feasibility study:* | | | |
| Analyze **system** **configuration requirements** to ensure that the components planned will support the scale of system deployment (number of users planned, system throughput and storage requirements, etc.) and interoperability/portability requirements. | System requirements analyst | Will the proposed hardware scale to the number of business unit locations we have now, and scale with expansion (up to 3x)?  Will the proposed system be able to handle network limitations of all of our locations?  Will the proposed system be suitable for our business?  Does our proposed use of the software comply with any international licensing restrictions? | Scalability may be insufficient  Management may reject proposed software/hardware platform because of cost.  Networking/infrastructure capabilities may be inadequate to serve the business operations over the proposed system; lag time may be unacceptable |
| Perform a technology trawl to identify hardware and software required to deliver the system | System requirements analyst | Can we define a set of standard, off-the-shelf system environment components (Hardware, OS, and Networking & DBMS software) to fit our budget and international system scale? | Currency fluctuations may affect actual cost of the hardware and software.  Management may reject proposed hardware/software because of cost |
| Research and identify services that we might contract with to perform currency tracking | System requirements analyst | Can we find multiple currency tracking vendors to which we can send an RFP?  Will those vendors have APIs that we can work with? | We may be unable to find a suitable vendor and have to implement our own currency exchange tracking and forecasting system. |
| Research and identify services that we might contract with to perform fax-to-email and/or software for PC-Fax | System requirements analyst | Can we find a suitable fax-to-email vendor or vendors that can work with our international business and with all of our country codes? | We may not be able to find a suitable vendor for all our locations.  A fax-to-email service would be preferable, but if we can find software that will meet our needs, we can work-around by connecting a computer to the fax line and using that software.  A third fallback would be to continue to scan faxes (less preferable). |
| Research and identify RFID and barcode labeling requirements and suppliers | System requirements analyst | Can we find vendors for RFID?  Do we need RFID and barcode?  Can we agree on a single standard that meets our business requirements? | Management may decide that the recommended hardware or labeling is too expensive; we may need to prepare several options at different price points. |
| *Project planning:* | | | |
| *Project Planning:*  Revisit system requirements, integrating input from the stakeholder analysis and the feasibility study, to make sure we have included all the work that needs to be done. | Project manager, systems analyst, key development team members | Has the requirements document been updated to capture all revisions and issues identified from analyses? | Missed/Incomplete requirements  A particular requirement(s) is not fully understood and is captured incorrectly |
| *Rearrange interim deliverables, to reflect learning from team planning discussions, emerging requirements, and dependencies discovered at this point.* | Project manager, systems analyst, key development team members | Are the requirements clear and achievable based on the dependencies and other project constraints?  Have team members analyzed sub- component dependencies from the perspective of their specialism? | Team members may not be sufficiently experienced to pick up on high-risk deliverables or dependencies  Need to involve specialist team members to identify dependencies |
| Revise the project plan, resource plan, effort, time and budget estimates and project schedule with the development team, to ensure that you have a feasible plan. | Project manager, development team, key stakeholders | Do we have sufficient effort, skills, time and resources to complete the project? | Incorrect estimates may affect project delivery – involve specialist on project team to produce more detailed work breakdowns for estimate & schedule.  Proper integrated change management not performed to determine the impact of the change on competing project constraints (scope, schedule, budget, etc.) |
| *Review and agree estimate and timescale changes with upper management.* | Project Manager, development team members, key stakeholders | Has management understood and signed off on (i) the project requirements specification, (ii) the project plan budget, and (iii) the project statement of work (SOW)? | May be negotiated down at this point – need to ensure that specification is reduced to keep project feasible  Estimate does not include management reserves or buffers and any reduction may affect project delivery |

## Phase I

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity** | **Resources Required** | **Evaluation Criteria** | **Risks Relating To Specific Activities** |
| *Perform Business Analysis:*  Analyze business process changes required, with current employees and managers. | Define a Business Analyst who will look at changes in the processes.  Documentation specialist. | Measuring the satisfaction of management and customer.  Do the solutions we deliver are acceptable? | Users may not understand the new process works. |
| *Phase I GUI & front-end menu implementation* | | | |
| Integrated user-navigation/access  Software requirements analysis.  Software design & code.  Module documentation and acceptance test | Analysts.  Documentation specialist.  UI designers (or client software developer with UI experience).  Programmer/analysts with web client development skills. | Does the UI meet the requirements? | Users may not understand the requirements and how it works.  GUI may not be helpful to users when they don’t like using it. |
| Provide advanced GUI to implement user menus and login form for UI client app  User navigation requirements analysis.  UI design & scripting.  UI documentation and acceptance test. | UI designers (or client software developer with UI experience).  Documentation specialist.  Programmer/analysts with web client development skills. | Does the UI meet the requirements?  Does the GUI clear and easy to use?  When user menus and login form configured, do that meet the requirements or it need to develop more? | Users may not understand the requirements and how it works.  GUI may not be helpful to users when they don’t like using it. |
| *Phase I Delivery Activities* | | | |
| Phase I Integration Test  Integration test of Phase I software components.  Redesign and rework following integration tests. | Database – Engineers to build the network-  Software. programmer/analysts (client and server side).  System test engineer. | Make sure all components work.  Do all the components interact with each other?  Does the system work well?  Does the system work to spec? | incomplete changes may lead to incompatible business rules. |
| Phase I change management  Business process changes.  Training on new work procedures.  User system training | Documentation specialist.  Business analysts.  Trainers for the system | Do all users understand how to deal with the system and new processes?  Do all the processes clear to the users?  Do all users understand how to deal with the new system? | Business processes may not be fit with the changes in the new procedures. |
| New process & systems evaluation  Phase I systems installation.  Phase I Testing.  Phase I System  Documentation.  Phase I User evaluation.  Evaluate the feedback. | System Analysis.  Programmer.  System test expert.  Documentation specialist  Network specialist. | Does the spec enough to have a good system?  Does everyone understand the new process?  Does the system easy to understand? | User may not understand how the system work.  Testing the system may lead to finding problems. |
| Project Review  Project plan review for Phase I.  Management approval and signoff for Phase I. | Project Managers.  System requirements analyst(s).  Programmers.  Engineers.  Database analysts. | How the system works overall?  Are there any other processes or changes need to be in Phase I?  Does the system work well to behave with the project?  After signing off on Phase I, Is the client happy to start scoping for Phase II? | Changes to requirements may not be suitable to be incorporated.  The client may choose to end the project at this stage. |

# 3. Effort Estimates and Resource Plan

Refer to separate Excel workbook for effort estimates

## Resource Plan

**Core team members**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Description** | **Cost** | **Needed** |
| **Business Analysts** | Business Analysts will work with stakeholders to document what business needs, and he is responsible for design the project, document the requirement, and manage the requirements. | $ 154.4 /hr | 10/29/18 - 12/17/18 |
| **System Analysts** | System analysts will work with the business analysts, and also with the programmer | $166.5 /hr | 12/12/18 - 6/1/22 |
| **Project Manager** | Has the responsibility for the successful initiation, planning, developing, design, execution, monitoring, controlling and closure of the project, also the project cost, time and scope. | $222.3 /hr | 10/29/18 - 10/19/22 |
| **Documentation Specialist** | Documentation specialist will be responsible for storing, collecting and maintenance of company's documents and cataloging and retrieval of documents. | $132.77 /hr | 10/29/18 - 11/9/21 |
| **Programmers** | The programmers will be responsible for creating and writing the code of the system. He will be working with the database analysts to make sure that all the codes and databases meet the requirements successfully. | $163.8 /hr | 12/10/18 - 6/1/22 |
| **Database Analysts** | Database analysts will be responsible for analyzing data, modeling the data, understanding the flow of the data to create a database for the system. | $144.80 /hr | 12/10/18 - 6/1/22 |
| **UI Designers** | User interface designers will be responsible for developing the user interface for the software and to make an understanding less complex interface, so users can use the functions easily. | $148.88 /hr | 12/10/18 - 6/1/22 |
| **Database Administrator (DBA)** | DBAs are responsible for storing and organizing data using specialized software. This job role may include capacity planning, troubleshooting, backup and data recovery. | $93,164/yr | 12/10/18 - 6/1/22 |
| **Software Tester** | Software Tester is responsible for assuring quality of software development and deployment | $93,164/yr | 12/10/18 - 6/1/22 |

\*Cost numbers were found from Glasssdoor.com

In the previous table, we have the Core Team Members who participate in the daily routine and the delivery of the project. They are essential to ensure that the project is moving toward success. All the works and efforts that members offer in the project need to have a collaborate to reach the goals. Business and System Analysts need to work with stakeholders to get the requirements done; then they work together with the project manager by gathering the customer requirements then analyze it. At this point, we can realize that they all collaborate to analyze, plan, and develop. The documentation specialist will involve collecting and cataloging documents which will help to organize the project workflow. The database analyst will work along with the data administrator and the documentation specialist to design the DBMS for the system. When the programmers end up with the coding, the user interface designer will design and develop the user interface for the system.

**Short-term consultants**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Description** | **Cost** | **Needed** |
| **Requirements Analyst** | Requirements analyst will be responsible for understanding the needs and translate requirements by taking the information gathered and puts it into a form, so the software developers can deal with it. | $151.7 /hr | 10/29/18 - 11/5/18  8/5/19 - 8/26/19  7/14/20 - 8/18/20 |
| **Network Specialist** | Network specialist will be responsible for set up, support and maintaining the networking systems | 138.00 /hr | 12/10/18 - 1/4/19 |

\*Cost numbers were found from Glasssdoor.com

In this table, we have short-term consultants who will be involved in the whole project, but they will engage in the project with their special skills that are not being obtained.

Cost:

Each resource works a full time, and they earn different cost per hour for their job. That includes the consulting and the overtime.

# 4. Project Schedule

## Overall Project Schedule Planning Approach

In creating our project plan (please see the attached Microsoft Project file), we stuck closely to the Activity-Level Work Breakdown Structure we created at the beginning of this assignment, which derives from the Mid-Level and High-Level Work Breakdown Structures we set up in our Project Scope and Proposal (Kumar, Johnson, Olowu, & Alghamdi, 2018b). These were designed to prioritize the critical and important tasks first, and to set things up in a logical order which would handle software dependencies appropriately. There are some cases where we are building a key component in an earlier phase and then developing the rest of the subsystem further in a later phase.

When we scheduled our project plan, we considered what activities we might be able to do in parallel. There is a significant amount of work for a project like this, but the system is also important to our business operations, so we considered how we might be able to get the project done in a reasonable amount of time while still making sure that we covered all task dependencies adequately.

Although we had separate project planners plan each phase of the project, when integrating the phases together into a single project plan, we considered when we might be able to reasonably start work that we knew we needed to do on the subsequent phase. We used a conservative method of starting the work for the next phase once we were able to review feedback from the pilot study and user evaluation for the current phase, or, in the case of the transition from Pre-Development Activities to Phase I, after we were able to revise the project plan and related planning documents. This meant that we would start working on the subsequent phase between 6-10 days, on average, before the end of the current phase, but that the only work left in the current phase would be our stage gate review and client approval. Since much of that time would be installing necessary hardware and software (in the case of Phase I), or updating the requirements and approach for the subsequent Phase (Phases II and III), this should allow us to minimize the risk related with issues that may arise within those last few tasks.

### Scheduling Risks

Overall, our largest scheduling risk is that the project may take too much time to complete. This is a complex project with many parts that have the potential to strongly affect our ability to operate our business. We also have additional challenges in that we have a user base that needs a lot of training and engagement to overcome their technological aversions and dislike of changes in their work processes, and that we have a multinational, multilingual, multi-currency company where the individual business units are spread widely apart. We also have to convince people in disparate business units performing vastly different tasks that the new system will benefit them and that they will play an important role in helping us make sure that it does. These things all mean that a project like this takes a lot of time, deliberation, and meetings, which increase the amount of time the project takes.

The biggest danger with the project taking so much time to complete (on the scale of multiple years) is that requirements and the way we do business could change before we have a chance to implement the system. It also poses challenges in terms of talent retention (Can we keep all of our talent busy and employed for the duration of the project? Will we lose staff to other projects and have to retrain new people?) and overall cost.

We have tried to construct a project plan that is careful to allocate enough time for each task in an appropriate order so that we can do things right. However, currently, we are aware that our project takes significantly longer than we are comfortable with. We will need to revisit our plan to see if we can rearrange some deliverables, add an additional phase, or address the issue through breaking up tasks and allocating additional resources.

## Individual Phases

### Pre-Development Activities Schedule

For the pre-development activities, we scheduled a project-planning kickoff to anchor the project and to allow us to discuss our observational strategies and any perceived needs moving forwards. We then scheduled the observations to be allowed to take place simultaneously (this was one of the reasons for splitting them into sections). Depending on the resources we have, five one-or two-person groups should be able to work at the same time, or we can assign a single one-or-two person group to one of the shorter observation tasks and then we can assign them to another short observation task when that finishes up.

The business analysis checkin meeting is scheduled to start two days after the observation groups begin, to allow them time to check in and compare notes. The business analysis followup meeting takes place after all of the other meetings and observations are completed; its purpose is to make sure that the teams have the opportunity to share and compare their observations and identify any questions we may have for followup.

After the observation period, the application design workshops for the stakeholder analysis are designed to be able to be conducted simultaneously (after the initial management and reporting workshop has been completed). These are of varying lengths depending on the amount and complexity of the functions planned in our current project scope. (For example, we don't expect manufacturing to take a very long time because of the relatively small number of functions we have for their system, although we do want to discuss some of the implementations of the proposed system with them and make sure that what we *do* design works for them. In particular, we expect that they may have insight on the Inventory Management system.)

After all of the other application design workshops have been conducted, there is a separate Management and Reporting workshop, which will allow us to make sure that all of the management and reporting requirements are covered and that they have been supported by the requirements we have uncovered so far from the other areas.

### Phase I Schedule

In Phase I, after we finished the pre-development activities, we start with a kickoff meeting with reviewing and that follows by developing the initial system which includes different tasks such as installing the hardware and the DBMS engine for the system. Following this, there will be a testing for the SQL interface and evaluating the system. This will take time to develop and keep track of the other tasks to make sure that everything works well together during the initial system development. After this, develop order processing & invoicing subsystem, billing & accounting subsystem, Inventory management subsystem, and system management subsystem are scheduled and developed.

### Phase II Schedule

Phase II starts with a kickoff meeting and follow up activities from phase I, including the reviewing and upgradation of software and hardware components. An upgrade to the system management subsystem with basic functionalities is scheduled to include the system and security management. After this, important subsystems such as Operations Management and Reporting, Forecasting and Analysis, Product code database and lookup, currency prediction and conversion, and Inventory management are developed. An upgrade to the system management subsystem with advanced functionalities is scheduled. In this task, logging and audit trail along with assigning permissions in the database, development of user interface with menus and login forms are accomplished. Following this, all the software components developed till date are integrated. The changes in the business process are analyzed by Business Analyst and user system trainings are scheduled to adapt to new working procedures. Finally, the system is evaluated and the current state of the project is analyzed to plan out the next subsequent phases.

### Phase III Schedule

Phase III commences with a kickoff meeting and follow up activities on phase II to review lessons learned and redesign software components respectively. An upgrade to the system management subsystem is scheduled to cover the basic system and security management. Following this, some of the important components for phase III are scheduled for development, which includes the product management subsystem (which is dependent on product code database and lookup function from phase II) and customer and vendor relationship subsystem. This would facilitate tracking of product marketing and development and customer relationship management.

The nice-to-have components are scheduled to be developed at this phase, which includes the Interface and Security for Supplier Web UI and Knowledge Management and Training subsystem. Additionally, a review and sign-off of the currency conversion system is scheduled as other major components depend on this service. An upgrade of operations management and reporting and system management (advanced functions) is scheduled to accommodate revisions from previous phases and allow for inclusion of new features.

Change management processes are initiated at the beginning of phase III and span through the phase. Other phase III delivery activities include integration test, process and systems evaluation, stage-gate and project closure.

# 5. Project Schedule Summary

Assumptions include:

* Hypothetical start date of October 29th, 2018
* No breaks for holidays that do not fall on weekends
* 5-day work week

| Phase | Component | Duration | Start Date | End Date |
| --- | --- | --- | --- | --- |
| Pre-Development | **Overall** | **36 days** | **Mon 10/29/18** | **Mon 12/17/18** |
|  | Perform Business Analysis | 5 days | Tue 10/30/18 | Mon 11/5/18 |
|  | Investigate Stakeholder Requirements | 8 days | Tue 11/6/18 | Thu 11/15/18 |
|  | Perform Business Analysis | 5 days | Tue 10/30/18 | Mon 11/5/18 |
|  | Project Planning | 19 days | Wed 11/21/18 | Mon 12/17/18 |
| Phase I | **Overall** | **176 days** | **Mon 12/10/18** | **Mon 8/12/19** |
|  | Develop Initial System Management Subsystem | 74 days | Wed 12/12/18 | Mon 3/25/19 |
|  | Develop Order Processing & Invoicing subsystem | 39 days | Wed 12/12/18 | Mon 2/4/19 |
|  | Develop Billing/Accounting subsystem | 29 days | Wed 12/12/18 | Mon 1/21/19 |
|  | Develop Inventory management subsystem | 43 days | Wed 12/12/18 | Fri 2/8/19 |
|  | Develop System Management Subsystem (advanced functions) | 129 days | Wed 12/12/18 | Mon 6/10/19 |
|  | Phase I Delivery Activities | 45 days | Tue 6/11/19 | Mon 8/12/19 |
| Phase II | **Overall** | **256 days** | **Thu 8/1/19** | **Thu 7/23/20** |
|  | Phase 1 follow up | 16 days | Mon 8/5/19 | Mon 8/26/19 |
|  | Upgrade System Management Subsystem (Basic) | 36 days | Tue 8/27/19 | Tue 10/15/19 |
|  | Develop Operations Management & Reporting subsystem | 72 days | Tue 8/27/19 | Wed 12/4/19 |
|  | Develop Forecasting and Analysis subsystem | 26 days | Thu 12/5/19 | Thu 1/9/20 |
|  | Develop Product code database and Lookup subsystem | 38 days | Fri 1/10/20 | Tue 3/3/20 |
|  | Develop Currency prediction and Conversion subsystem | 7 days | Wed 3/4/20 | Thu 3/12/20 |
|  | Upgrade System Management Subsystem (advanced functions) | 18 days | Fri 3/13/20 | Tue 4/7/20 |
|  | Develop Inventory management subsystem | 14 days | Wed 4/8/20 | Mon 4/27/20 |
|  | Phase II Delivery Activities | 63 days | Tue 4/28/20 | Thu 7/23/20 |
| Phase III | **Overall** | **594 days** | **Fri 7/10/20** | **Wed 10/19/22** |
|  | Follow up on Phase II activities | 26 days | Tue 7/14/20 | Tue 8/18/20 |
|  | Upgrade System Management Subsystem (Basic) | 48 days | Wed 8/19/20 | Fri 10/23/20 |
|  | Develop Product management subsystem | 80 days | Tue 10/20/20 | Mon 2/8/21 |
|  | Develop Customer and Vendor Relations subsystem | 72 days | Tue 2/9/21 | Wed 5/19/21 |
|  | Develop Interface and Security for Supplier Web UI | 80 days | Thu 5/20/21 | Wed 9/8/21 |
|  | Develop Knowledge Management and Training subsystem | 44 days | Thu 9/9/21 | Tue 11/9/21 |
|  | Review Currency Prediction and Conversion subsystem | 41 days | Mon 10/4/21 | Mon 11/29/21 |
|  | Upgrade Operations Management & Reporting subsystem | 60 days | Tue 11/30/21 | Mon 2/21/22 |
|  | Upgrade System Management Subsystem (advanced functions) | 72 days | Tue 2/22/22 | Wed 6/1/22 |
|  | Phase III Delivery Activities | 172 days | Tue 2/22/22 | Wed 10/19/22 |

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# Appendix 1 - Detailed Activity-Level Work Breakdown Structure

**Pre-Development Activities**

*Perform Business Analysis:*

* Meet with current employees and managers (including representatives from bottlers, HQ, manufacturing, etc.) to analyze business process changes required

*Investigate stakeholder requirements for software components:*

* Analyze system user requirements of employees (in all departments), managers, and external stakeholders (suppliers, retailers/distributors), to make sure that we have a complete understanding of what they need and expect the system to do.
  + Conduct Management and Reporting design workshop #1
  + Conduct Sales application design workshop
  + Conduct Marketing and Development application design workshop
  + Conduct Manufacturing application design workshop (brief)
  + Conduct Customer and Vendor Relations application design workshop
  + Conduct Purchasing and Inventory Management design workshop
  + Conduct Accounting design workshop
  + Conduct Management and Reporting design workshop #2
  + Conduct System Administration application design workshop

*Perform feasibility study:*

* Analyze the system configuration requirements for scale and interoperability/portability.
* Perform a technology trawl to identify hardware and software required to deliver the system
* Research and identify services that we might contract with to perform currency tracking
* Research and identify services that we might contract with to perform fax-to-email

*Project planning:*

* Revisit system requirements, integrating input from the stakeholder analysis and the feasibility study, to make sure we have included all the work that needs to be done.
* Rearrange interim deliverables, to reflect learning from team planning discussions, emerging requirements, and dependencies discovered at this point.
* Revise the project plan, resource plan, effort, time and budget estimates and project schedule with the development team, to ensure that we have a feasible plan.
* Review and agree estimate and timescale changes with upper management.

#### **Phase 1: Develop Basic Integrated Business Management System**

Phase 1 Kickoff Meeting

##### Develop Initial System Management Subsystem

DBMS: Install & Configure DBMS Engine & SQL Interface

* Install & Configure DBMS engine
* Install and test SQL interface software
* Installing hardware server
* Test Network connections
* Evaluate the system

DBMS: User Accounts and Permissions

* Design database
* Implement and test database structure
* Test accounts

Server App: System management and security application

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: System management application

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Integrated User Interface: Provide integrated GUI to implement basic access stubs for all client apps. In Phase 1

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

##### Develop Order Processing & Invoicing subsystem

DBMS: Orders & Invoicing Database – Full implementation

* Design database
* Implement and test database structures

Server App: Billing/Invoicing

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Sales

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

##### Develop Billing/Accounting subsystem

DBMS: Budgeting and Accounting

* Design database
* Implement and test database structures

Server App: Billing/Invoicing

* Software requirements analysis
* Software design & code
* Unit test
* Module documentation and acceptance test

Client App: Accounting

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

##### Develop Inventory management subsystem

DBMS: Resources & Inventory Database

* Design database
* Implement and test database structures

Server App: Purchasing & Inventory Management

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Inventory Management

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

##### Develop System Management Subsystem (advanced functions)

DBMS: Logging & Audit Trail for Phase I functions.

* Design database
* Implement and test database structures

*GUI & front-end menu implementation*

Client App: Integrated user-navigation/access

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Provide advanced GUI to implement user menus and login form for UI client app.

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

##### Phase I Delivery Activities

Phase I Integration Test

* Integration test of Phase I software components
* Redesign and rework following integration tests
* Phase I software documentation and acceptance test

Phase I Change management

* Training on new work procedures
* Kaeakola process changes
* User system training

New process & systems evaluation

* Phase I systems installation
* Phase I Testing
* Phase I System Documentation
* Phase I User evaluation
* Evaluate the feedback

Project Review

* Project plan review for Phase I
* Management approval and signoff for Phase I

#### **Phase II: Develop Advanced Integrated Business Management System**

Phase 2 Kickoff Meeting

* Phase 1 follow up
* Review Phase I software and hardware components
* Upgrade the software requirements

##### Upgrade System Management Subsystem (Basic)

Server App: Upgraded system management and security management

* Module documentation and acceptance test

Client App: System management and security integration

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Provide integrated GUI to implement basic access stubs for all client apps. In Phase II

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

##### Develop Operations Management & Reporting subsystem

DBMS: Sales and Market

* Design database by creating tables and integrating with the server application
* Implement and test database structures
* Gather information regarding previous sales and market demands.

Server App: Sales Analysis and Reporting

* Software requirements analysis
* Software design & code – include writing a program to display the analysis using charts and graphs for easy understanding.
* Module documentation and acceptance test

Client App: Management and Reporting

* Software requirements analysis
* Software design & code
  + Develop a user friendly UI that shows the graph and charts of sales against time duration and scale.
  + Application used to report
  + Develop the GUI
  + Unit testing of GUI
* Module documentation and acceptance test

##### Develop Forecasting and Analysis subsystem

DBMS: Update Sales and Market Database – add forecasting & analysis table

* Design database by creating tables and integrating with the server application
* Implement and test database structures
* Import previous data from Sales and Market Database

Server App: Demand Forecasting

* Software requirements analysis
* Software design & code
  + Use the gathered information relating to previous sales and market demands from ‘Sales and Market’ database
  + Write a logic to generate the demand value according to the previous sales and market demands
* Module documentation and acceptance test

Client App: Management and Reporting - add demand forecasting

* Software requirements analysis
* Software design & code
  + Develop UI to view the forecasted demand value
* Module documentation and acceptance test

##### Develop Product code database and Lookup subsystem

DBMS: Product Management (only product code-related tables)

* Design database by creating tables and integrating with the server application
* Implement and test database structures
* Integrate labels and RFID tags

Server App: Marketing and Development (functions related to product code)

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Marketing and Development Application (functions related to product code)

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Service: Product code lookup service

* Software requirements analysis
* Software design & code
* Integration testing
* Documentation and acceptance test

##### Develop Currency prediction and Conversion subsystem

Server App: API to Vendor currency database

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

##### Upgrade System Management Subsystem (advanced functions)

DBMS: Logging & Audit Trail for Phase II functions.

* Design database by creating tables and integrating with the server application
* Implement and test database structures

DBMS: Permissions for Phase II functions.

* Update database
* Implement and test database structures

Server App: Upgraded system management and security application for Phase II functions

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: user-navigation/access and reporting for Phase II Enhancements

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client app: Provide advanced GUI to implement user menus and login form for UI client app. (Phase II)

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

##### Develop Inventory management subsystem

DBMS: Resources & Inventory Database

* Design database by creating tables and integrating with the server application
* Implement and test database structures

Server App: Purchasing & Inventory Management

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Inventory Management

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

##### Phase II Delivery Activities

Integrate all the software components developed.

Phase II Integration Test

* Integration test of Phase II software components
* Redesign and rework following integration tests
* Phase I software documentation and acceptance test

Phase II change management

* Business process changes
* Training in new work procedures
* User system training

New process & systems evaluation

* Phase II systems installation
* Phase II pilot study
* Phase II user evaluation
* Evaluation feedback and client review

Project Review (Stagegate)

* Stagegate (project plan) review for Phase II
* Agreement of client issues to be remedied in Phase II
* Client approval and signoff for Phase II

***Phase III: Develop Integrated Business Management System***

Phase III Kickoff Meeting

* Review lessons learned from Phase 2 prototype and user evaluation
* Review software and hardware requirements
* Agree on changes to be made and assign tasks

Follow up on Phase II activities

* Redesign software components
* Code and test software updates
* Integration and regression testing for phase II components

Upgrade System Management Subsystem (Basic)

Server App: Upgraded system management and security management

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App:  System management and security integration

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client app: Provide integrated GUI to implement basic access stubs for all client apps. In Phase II

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

Develop Product management subsystem

DBMS: Product management - continue development

* Design additional tables
* Implement and test database structures

Server App: Update Marketing and Development Application

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Update Marketing and Development Application

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Develop Customer and Vendor Relations subsystem

DBMS: Customer Relationship Management

* Design database
* Implement and test database structures

Server App: CRM & Vendor Relations

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Customer and Vendor Relations

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Develop Interface and Security for Supplier Web UI

DBMS: Update Orders and Invoicing Database – add quotations table

* Design database
* Implement and test database structures

Server App: Purchasing/Inventory

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Supplier Web UI

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Develop Knowledge Management and Training subsystem

DBMS: Knowledgebase database

* Design database
* Implement and test database structures

Server App: Knowledgebase and Training Manual

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Training Manual and Knowledgebase application

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Review Currency Prediction and Conversion subsystem

* Code and test software changes
* Integration and regression testing for each component
* Validate and test results
* UAT
* Sign-off

Upgrade Operations Management & Reporting subsystem

DBMS: Sales and Market Phase III functions

* Design database
* Implement and test database structures

Server App: Upgraded Sales Analysis and Reporting for Phase III functions

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: Management and Reporting for Phase II and III enhancements

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Upgrade System Management Subsystem (advanced functions)

DBMS: Logging & Audit Trail for Phase III functions.

* Design database
* Implement and test database structures

Server App: Upgraded system management and security application for Phase III functions

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Client App: user-navigation/access and reporting for Phase II Enhancements

* Software requirements analysis
* Software design & code
* Module documentation and acceptance test

Web client: Provide advanced GUI to implement user menus & login form for UI client app. Phase III

* User navigation requirements analysis
* UI design & scripting
* UI documentation and acceptance test

Phase III Delivery Activities

Phase III Integration Test

* Integration test of Phase III software components
* Redesign and rework following integration tests
* Phase I & II software documentation and acceptance test

Phase III Change Management

* Business process change
* Training on new work procedures
* Update standard operating procedures
* User training/train the trainer sessions
* Set up and train support team (first-level and second-level)

Process and System Evaluation

* Systems installation
* Pilot test
* User evaluation/feedback

Project Review (Stagegate)

* Stagegate review for the final system
* Remediation of client issues
* Client approval and signoff for final system

Project Closure

* Procurement close
* Obtain formal acceptance
* Release resources

# Appendix 2 - Resources Required by Task

## Phase II

##### Upgrade System Management Subsystem (Basic)

|  |  |
| --- | --- |
| Server App: Upgraded system management and security management   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client App: System management and security integration   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client App: Provide integrated GUI to implement basic access stubs for all client apps. In Phase II   * User navigation requirements analysis * UI design & scripting * UI documentation and acceptance test | Resources Required:  System Requirements Analyst  Software Developer  Software Tester  UI designer |

##### Develop Operations Management & Reporting subsystem

|  |  |
| --- | --- |
| DBMS: Sales and Market   * Design database by creating tables and integrating with the server application * Implement and test database structures * Gather information regarding previous sales and market demands.   Server App: Sales Analysis and Reporting   * Software requirements analysis * Software design & code – include writing a program to display the analysis using charts and graphs for easy understanding. * Module documentation and acceptance test   Client App: Management and Reporting   * Software requirements analysis * Software design & code   + Develop a user friendly UI that shows the graph and charts of sales against time duration and scale.   + Application used to report   + Develop the GUI   + Unit testing of GUI * Module documentation and acceptance test | Resources Required:  Expert database software engineer/DBA  System requirements Analyst  Software developer  Software tester  UI designer |

##### Develop Forecasting and Analysis subsystem

|  |  |
| --- | --- |
| DBMS: Update Sales and Market Database – add forecasting & analysis table   * Design database by creating tables and integrating with the server application * Implement and test database structures * Import previous data from Sales and Market Database   Server App: Demand Forecasting   * Software requirements analysis * Software design & code * Use the gathered information relating to previous sales and market demands from ‘Sales and Market’ database * Write a logic to generate the demand value according to the previous sales and market demands * Module documentation and acceptance test   Client App: Management and Reporting - add demand forecasting   * Software requirements analysis * Software design & code * Develop UI to view the forecasted demand value   Module documentation and acceptance test | Resources Required:  Expert database software engineer/DBA  System requirements Analyst  Software developer  Software tester  UI designer |

##### Develop Product code database and Lookup subsystem

|  |  |
| --- | --- |
| DBMS: Product Management (only product code-related tables)   * Design database by creating tables and integrating with the server application * Implement and test database structures   Server App: Marketing and Development (functions related to product code)   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client App: Marketing and Development Application (functions related to product code)   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Service: Product code lookup service   * Software requirements analysis * Software design & code * Integration testing * Documentation and acceptance test | Resources Required:  Expert database software engineer/DBA  System requirements Analyst  Software developer  Software tester  UI designer |

##### Develop Currency prediction and Conversion subsystem

|  |  |
| --- | --- |
| Server App: API to Vendor currency database   * Software requirements analysis * Software design & code * Module documentation and acceptance test | Resources Required:  Software Requirements Analyst  Software Developer  Software Tester |

##### Upgrade System Management Subsystem (advanced functions)

|  |  |
| --- | --- |
| DBMS: Logging & Audit Trail for Phase II functions.   * Design database by creating tables and integrating with the server application * Implement and test database structures   DBMS: Permissions for Phase II functions.   * Update database * Implement and test database structures   Server App: Upgraded system management and security application for Phase II functions   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client App: user-navigation/access and reporting for Phase II Enhancements   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client app: Provide advanced GUI to implement user menus and login form for UI client app. (Phase II)   * User navigation requirements analysis * UI design & scripting * UI documentation and acceptance test | Resources Required:  Expert database software engineer/DBA  System requirements Analyst  Software developer  Software tester  UI designer |

##### Develop Inventory management subsystem

|  |  |
| --- | --- |
| DBMS: Resources & Inventory Database   * Design database by creating tables and integrating with the server application * Implement and test database structures   Server App: Purchasing & Inventory Management   * Software requirements analysis * Software design & code * Module documentation and acceptance test   Client App: Inventory Management   * Software requirements analysis * Software design & code * Module documentation and acceptance test | Resources Required:  DBA  Software Requirements Analyst  Software Developers  Software Tester |

##### Phase II Delivery Activities

|  |  |
| --- | --- |
| Integrate all the software components developed.  Phase II Integration Test   * Integration test of Phase II software components * Redesign and rework following integration tests * Phase I software documentation and acceptance test   Phase II change management   * Business process changes * Training in new work procedures * User system training   New process & systems evaluation   * Phase II systems installation * Phase II pilot study * Phase II user evaluation * Evaluation feedback and client review   Project Review (Stagegate)   * Stagegate (project plan) review for Phase II * Agreement of client issues to be remedied in Phase II * Client approval and signoff for Phase II | Resources Required:  Software Tester  Business Analyst |