

Project: United Healthline Networks

CSE 5325 – Fall 2018

COST ESTIMATION

Version: 3.0

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1. INTRODUCTION AND EXECUTIVE SUMMARY

United Healthline Networks (UHN) is a small company located in Arlington, Texas. In order to help their clients, keep track of personal health-related data, UHN have approached our team to create a website and an Android application. This project should be capable of monitoring vital signs, daily medicine intake or a diet regiment. This would also lead to their brand building and establishing online presence. The website and an android application must be up and operational by December 10th, 2018.

We have outlined various tasks such as Requirement gathering, Architecture review, System design and coding, Integration and testing which we would undertake while developing the website and the Android application. Because of a three-month duration and having the complete requirements for this project, we would use the Waterfall model.

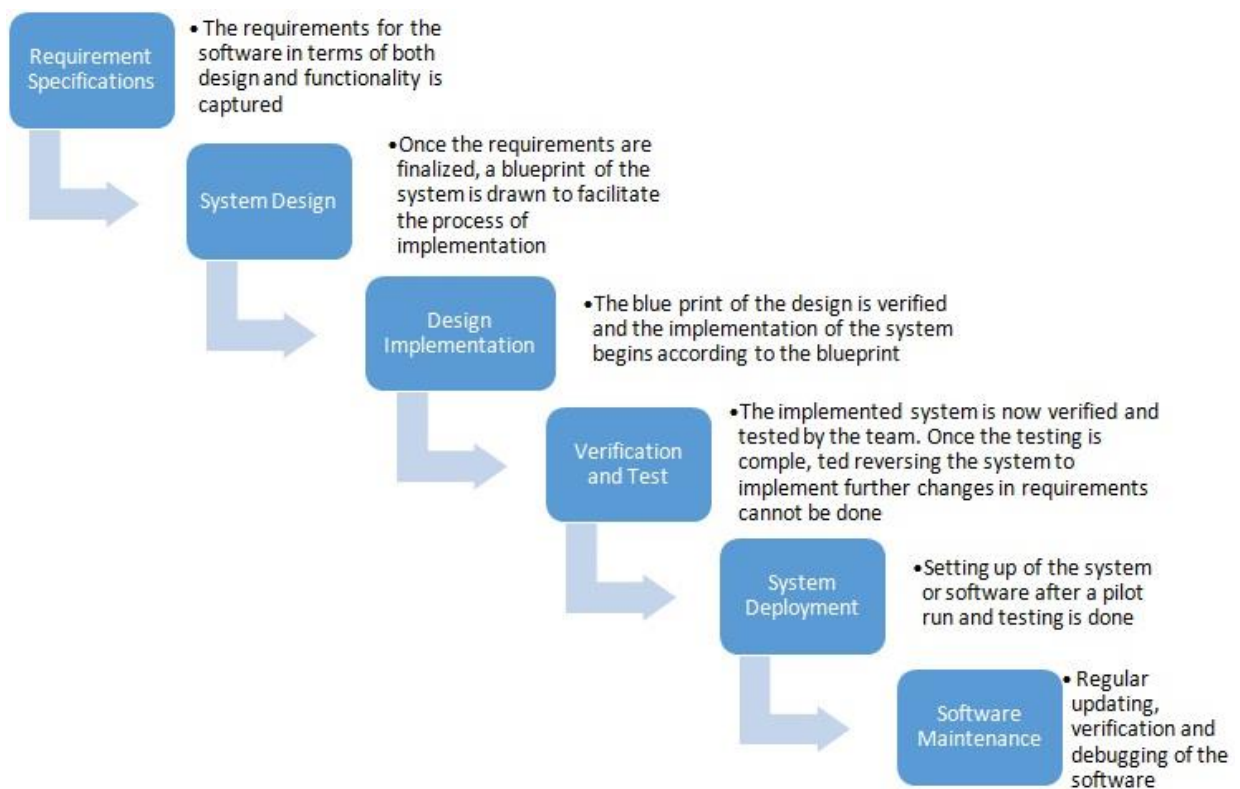
This project would have two sets of releases, the first release would be on the November 10th, 2018 and the second and the final release would be on the December 10th, 2018. The first release is called v1.0 and would have all the basic functionalities specified by the client. The second release is called v2.0 and would have all the functionalities tested and ready to use for our client. We would be adding the GPS feature to search nearby pharmacy stores only upon a request from the client. The estimated cost includes salaries, hardware requirements, software requirements and other surcharges. We will also have a contract with the client stating that the source code will not be shared with them. Thereby this project will yield higher returns and be a potential gain to the company by acquiring new clients while retaining existing ones.

2. PROJECT PLAN

Since the requirements are very well known, clear and fixed. The project is short and has understood the technology, thereby, we already have the client's requirements in place we would be using Waterfall model in the project.

With waterfall model we have the following advantages [1]:

- This model is simple and easy to understand and use.
- It is easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process.
- In this model phases are processed and completed one at a time. Phases do not overlap.
- Waterfall model works well for smaller projects where requirements are very well understood.



3. SYSTEM SPECIFICATION AND RESOURCES ASSIGNED

System Constraints include the following:

- The system shall support 3-D secure model at the payment gateways to implement security for all the online transactions. The payment gateways will accept all the major card types like Master Card, Visa, Discover, etc.
- The system will use SSL layer for all the connections between the server and the user to maintain the integrity of the data.
- Google Search will be integrated into the system for search requirements
- Project will employ database for storing customer data and order management.
- Social media plugins will also be integrated in the system so that customers can follow company's social media account for latest update and news.
- Analytics tool will be integrated for report generation.

The following resources and their costs are as follows:

- | | |
|---|-------------------|
| • Programmer 1 | \$5000 pm |
| • Programmer 2 | \$5000 pm |
| • Designer | \$5000 pm |
| • Tester 1 | \$5000 pm |
| • Tester 2 | \$5000 pm |
| • Project Manager | \$10000 pm |
| • Office Space | \$6400 pm |
| • 6 Laptops | \$5786 |
| • 6 Microsoft Visual Studio | \$4500 @\$250 pm |
| • Telerik Reporting | \$600 |
| • Website Domain | \$11.99 (1 year) |
| • Payment Gateway | \$360 @\$25-30 pm |
| • Website Hosting with office 365
webmail and search engine visibility | \$133.6 (1 Year) |

Sl. No.	Items	Description	Quantity	Unit	Rate(\$)	Amount(\$)
1	Laptops	Apple MacBook Pro – 13”Display – Intel Core i5 For Website Development	2		1,199	2,398
2	Laptops	Dell Inspiron i7559-2512BLK for Android Development	4		847	3,388
3	Software	Microsoft Visual Studio Enterprise Edition (\$250/month)	6		4,500	4,500
		Telerik Reporting	1		600	600
		Android Studio and SDK tools	3		Free	Free
4	Backend	Website Domain (GoDaddy- 1 year)			11.99	11.99
		Payment Gateway (\$ 25-30 per month for 1 year)			360	360
		Website Hosting with office 365 webmail and search engine visibility (1year Plan)			133.55	
	Manpower					
5	Manager	8 hours/day for 65 days (Excl. Holidays)	520	Hour	100	52000
6	Resource persons (5)	8 hours/day for 65 days (Excl. Holidays)	2600	Hour	50	130000

4. PROJECT COST STRUCTURE

4.1 SOURCE LINE OF CODE

The system shall be a web based and an android application which would allow users to help their clients, keep track of personal health-related data. User can browse the website without registering, however if they want to buy or use any health stats, they need to register themselves with the system. The system will have a admin account which would allow the admin to control and update the website. The functionalities of the admin account will include like creating new categories and inserting new items, deleting/adding items, updating medicine screens, etc. System will also allow the employees of UHN to do these operations but with limited functionalities. The users can search the website and can place an order via creating/login into the system.

The estimate of the source line of code is **5000 SLOC** to meet the requirements.

4.2 SCALE DRIVERS

PRECEDENTEDNESS: It will measure the similarity of the current project with the ones that have been undertaken by the team earlier. Since it is a web based and android project and the team has developed such projects in the past, I have marked the precededentness as **Very High** - Largely Familiar

DEVELOPMENT FLEXIBILITY: It will measure the flexibility of the requirements that are supposed to be met by the team. Since the requirements are changing, we have marked development flexibility as **High** – General Conformity

ARCHITECTURE / RISK RESOLUTION: It measures the degree to which the architecture has already been defined. Since the architecture has been laid down well and validated to avoid risks, we have kept Architecture/ Risk Resolution as **High** – Generally (75%)

TEAM COHESION: It depends on the relationships among the stakeholders. Since there are seamless interactions with the stakeholders, I have kept team cohesion as **High** - Largely Cooperative

PROCESS MATURITY: It depends on the SEI Maturity Scale of the company. Since the software process for both management and engineering activities is documents, standardized and integrated into a standard software process for the entire organization, I have kept process maturity as **High** - SEI CMM Level 3 “Repeatable” – Basic Processes are established.

4.3 COST DRIVERS

ANALYST CAPABILITY COST DRIVER: This is a measure of the capability of the analyst so as to know how well the analyst can understand and lay down the requirements of the project. Since our team holds designer who will participate in the requirements phase and lay down the requirements thoroughly, we have kept the measure of analyst capability as **Nominal - 55th Percentile – about average**

APPLICATION EXPERIENCE COST DRIVER: It is a measure of the experience the team holds with this type of application. Since, the team has a substantial experience with similar type of application, we have kept it as **High – 3 years**

PROGRAMMER CAPABILITY COST DRIVER: It is a measure of the capability of the programmers for the project. Since in our team, the programmers have handled such projects earlier as well, we have kept the programmer capability as **Very High – 90th percentile – your best team.**

Note: I have also mentioned in the Project plan earlier about working with people who are apparently the cream of the industry.

PLATFORM EXPERIENCE COST DRIVER: It is a measure of the experience of the team with the target platform. Since the team has also undertaken such projects in the past, I have kept the platform experience as **High – 3 years**

LANGUAGE AND TOOL EXPERIENCE: It is a measure of the experience of the team with the language and tools that shall be used for this project. Since our team has significant knowledge and experience of the language and tools because of the past projects, we have kept language and tool experience as **High – 3 years**

PERSONNEL CONTINUITY COST DRIVER: It is a measure of the continuity of the personnel with the current organization and measured in terms of the turnover per year. Since the team that is working with has been with the company for a long duration except a few, we have marked personnel continuity as **High – 6% turnover per year**

USE OF SOFTWARE TOOLS COST DRIVER: It measures the number based on the complexity of the tools that the team will use for the development of the project. Since our team will use mature life-cycle tools, we have marked use of software tools as **High**

- **Strong, mature life cycle tools, moderately integrated**

MULTISITE DEVELOPMENT COST DRIVER: It measures the number based how the team is split and how well do they communicate. Since our team will mostly be located in the same city, I have marked multisite development as **Very High - Same building or complex. Occasional video conferencing**

DEVELOPMENT SCHEDULE COST DRIVER: It is a number that is measure of the compressed schedule from that of the default schedule. We have the target of completing the project as soon as possible and hence I have marked development schedule as **Nominal – 100% of nominal schedule**

EXECUTION TIME CONSTRAINT COST DRIVER: It is a measure depending upon the CPU time that the software will use. Since it is a web-based and mobile application, it will use very high execution time and hence we have marked execution time constraint as **High – 70% use of available execution time**

MAIN STORAGE CONSTARINT COST DRIVER: It is the measure depending upon the main memory that the software will use. I have marked it as **Nominal <=50% use of available storage**

PLATFORM VOLATILITY COST DRIVER: It is a measure based on how often the platform changes due to updates or any other reason. Since the platform that we are using will have not must change I have marker as **Nominal – Major change every 6 months; Minor changes 2 weeks**

REQUIRED RELIABILITY COST DRIVER: It is a measure based upon the consequences of the software failure. Since there won't be much of severe consequences because of software failure, I have marked required reliability as **Nominal – Moderate, easily recoverable losses**

DATABASE SIZE COST DRIVER: It is a measure depending upon the data that would be required to test the software. Since we will require certain data for testing purposes, I have marked database size as **Nominal $10 \leq (\text{Database bytes} / \text{SLOC}) < 100$**

PRODUCT COMPLEXITY COST DRIVER: It is a measure based on the complexity of the software being developed. Since our system will have nested codes, multiple files, attractive GUI and standard math routines, I have kept product complexity as **Nominal - Nested code, standard math routines, multiple files**

REQUIRED RESUABILITY COST DRIVER: It is a measure which is calculated based on the software components that are to be reused. We shall be developing components to be reused across the projects and hence I have kept the required reusability as **Nominal – Across project**

DOCUMENTATION MATCH TO LIFE-CYCLE NEEDS: It is a measure which is largely dependent upon the documentation that we are creating in the product development. Since though I have assigned resources and time for this task, it has low priority in this project **Low – Some Life-cycle needs uncovered**

4.4 COCOMO II ESTIMATE

The Softstar[14] tool is used to configure for scaled drivers as:

Totals for entire Project		Effort (PM)	Duration (Mo)	Cost (K\$)	Productivity	Equivalent Size
Requirements	RQ:	0.5	1.1	7.1		Total Size: 5,000
Development	PD+DD+CT+IT:	6.7	6.5	103.8	742.6	
Total	RQ+PD+DD+CT+IT:	7.2	7.7	110.8	694.0	

COCOMO II Scale Factors for Estimate: Estimate1

Model: COCOMO® II 2000

Model ID: 2000

Phases: Waterfall

Model Type: COCOMO II

[Select Model...](#)

[Show Equations](#)

[APM Settings...](#)

Precedentedness:
Generally Familiar

Development Flexibility:
Some Conformity

Architecture / Risk Resolution:
Generally (75%)

Team Cohesion:
Largely Cooperative

Process Maturity:
SEI CMM Level 3

[Drivers & Size](#) / [Model](#) / [REVL](#) / [Reuse](#) / [Function Points](#) / [Increments](#) / [Breakage](#) / [Costs](#) / [Rates](#) / [Maint.](#) / [Filter](#) / [Descr.](#)

EQUATIONS REPORT:

Estimate1 - Equations Report			
SystemStar 3.0 Demo		November 8, 2018	02:11:12
		Page: 1	
Estimate Name:	Estimate1	Estimate ID:	Estimate1
Model Name:	COCOMO® II 2000	Model ID:	2000
Process Model:	COCOMO® II Model	Phases:	Waterfall
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">COCOMO Estimating Equations</div> <div style="display: flex; justify-content: space-between;"> <div> $\text{Effort} = 2.9400 * \text{EAF} * (\text{KSLOC})$ </div> <div style="text-align: right;"> $1.0263 \text{ EAF} = 0.4390$ </div> </div> <p>= Effort in Person-Months</p> <div style="display: flex; justify-content: space-between;"> <div> $\text{Schedule} = 3.6700 * (\text{Effort})$ </div> <div style="text-align: right;"> 0.3033 </div> </div> <p>= Duration in Months</p> <div style="display: flex; justify-content: space-between;"> <div> $\text{Maintenance Effort} = 2.9400 * \text{EAF} * (\text{KSLOC})$ </div> <div style="text-align: right;"> 1.0263 </div> </div> <p>= Effort (per year) in Person-Months</p> <div style="text-align: center; padding-top: 10px;"> <p>152 hours per Person-Month</p> </div>			

The Softstar tool has been configured for cost drivers and SLOC as:

ACT	ARC	CBR	CDF	CDR	CMP	CST	DET	EBR	EFF	EQS	GCS	GMI	GST	IDT	ISM	MSZ	NAM	PDF	RSK	SCH	SIZ	SSM	STR
Totals for entire Project		Effort (PM)		Duration (Mo)		Cost (K\$)		Productivity		Equivalent Size													
Requirements RQ:		0.5		1.1		7.1				Total Size: 5,000													
Development PD+DD+CT+IT:		6.7		6.5		103.8		742.6															
Total RQ+PD+DD+CT+IT:		7.2		7.7		110.8		694.0															

COCOMO II Cost Drivers for Component: Component1

Personnel

ACAP... High

APEX... Very High

PCAP... High

PLEX... High

LTEX... High

PCON... High

Platform

TIME... High

STOR... Nominal

PVOL... High

Product

RELY... Nominal

DATA... Nominal

CPLX... Nominal

RUSE... Nominal

DOCU... Low

Project

TOOL... High

SITE... High

SCED... Nominal

Size Summary

Size:

Method: SLOC

User Defined

USR1... Undefined

USR2... Undefined

USR3... Undefined

USR4... Undefined

Drivers & Size / Model / REVL / Reuse / Function Points / Increments / Breakage / Costs / Rates / Maint / Filter / Descr.

The labor rates that have been entered are:

ACT	ARC	CBR	CDF	CDR	CMP	CST	DET	EBR	EFF	EQS	GCS	GMI	GST	IDT	ISM	MSZ	NAM	PDF	RSK	SCH	SIZ	SSM	STR
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Totals for entire Project		Effort (PM)	Duration (Mo)	Cost (K\$)	Productivity	Equivalent Size
Requirements	RQ:	0.5	1.1	7.1		Total Size: 5,000
Development	PD+DD+CT+IT:	6.7	6.5	103.8	742.6	
Total	RQ+PD+DD+CT+IT:	7.2	7.7	110.8	694.0	

Labor Rates for Estimate: Estimate1

Labor Class	Cost per Person-Month
Programmer - 1	5000
Programmer - 2	5000
Designer	5000
Tester -1	5000
Tester - 2	5000
Project Manager	10000
	0
	0
	0
	0
	0
	0

This tab is an alternative to the Costs tab.

1) Define the names and rates of your labor classes in the table on the left. These rates apply to the entire estimate.

2) Edit the Labor Distribution Worksheet for each component. SystemStar will calculate the cost per Person-Month for each phase (displayed on the Costs tab).

Edit Labor Distribution Worksheet...

Revert to Model Values

[Drivers & Size](#) / [Model](#) / [REVL](#) / [Reuse](#) / [Function Points](#) / [Increments](#) / [Breakage](#) / [Costs](#) / [Rates](#) / [Maint.](#) / [Filter](#) / [Descr.](#)

The labor distribution worksheet has been configured as:

★ Labor Distribution Worksheet

Component Name: Component1

Labor Class	RQ	PD	DD	CT	IT	MN
Programmer - 1	0	0	0	0	0	15
Programmer - 2	0	0	0	0	0	15
Designer	0	0	0	0	0	5
Tester - 1	0	0	0	0	0	15
Tester - 2	0	0	0	0	0	15
Project Manager	0	0	0	0	0	35
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
Total %	0	0	0	0	0	100

OK Cancel Apply

Inception Phase (RQ): In the inception phase, the designer and project manager will play a main role in gathering all the requirements. Programmers and tester will analyze the requirements to understand the system being developed.

Elaboration Phase (PD &DD): In the elaboration phase, a basic layout will be laid down by the developers based on the requirements gathered so as to understand the system being developed. The UML diagrams will be drawn in this phase also architecture review will also take place.

Construction Phase (CT): In the Construction phase, actual coding will be done for the development of the system. The programmers will play a crucial role in this phase in coding, whereas the testers will start writing the test cases.

Transition Phase (IT): In the transition phase, each component developed by the developer team will be tested separately by the testers and then debugged by the developers if any errors are found. Integration testing is done in this phase.

Maintenance Phase (MN): In this phase, after the successful testing of the system, the system will then be implemented, and the maintenance will be offered. The programmers will play a crucial role in maintenance of the system and hence they will contribute 15% each. The testers will test any changes that the developers make in the maintenance phase thereby contributing 15% The designer and manager will have 5% and 35% contribution to this phase.

The cost for each component calculated by the Softstar is:

ACT	ARC	CBR	CDF	CDR	CMP	CST	DET	EBR	EFF	EQS	GCS	GMI	GST	IDT	ISM	MSZ	NAM	PDF	RSK	SCH	SIZ	SSM	STR																										
<table border="1"> <thead> <tr> <th colspan="2">Totals for entire Project</th> <th>Effort (PM)</th> <th>Duration (Mo)</th> <th>Cost (K\$)</th> <th>Productivity</th> <th>Equivalent Size</th> </tr> </thead> <tbody> <tr> <td>Requirements</td> <td>RQ:</td> <td>0.5</td> <td>1.1</td> <td>7.1</td> <td></td> <td rowspan="3">Total Size: 5,000</td> </tr> <tr> <td>Development</td> <td>PD+DD+CT+IT:</td> <td>6.7</td> <td>6.5</td> <td>103.8</td> <td>742.6</td> </tr> <tr> <td>Total</td> <td>RQ+PD+DD+CT+IT:</td> <td>7.2</td> <td>7.7</td> <td>110.8</td> <td>694.0</td> </tr> </tbody> </table>																								Totals for entire Project		Effort (PM)	Duration (Mo)	Cost (K\$)	Productivity	Equivalent Size	Requirements	RQ:	0.5	1.1	7.1		Total Size: 5,000	Development	PD+DD+CT+IT:	6.7	6.5	103.8	742.6	Total	RQ+PD+DD+CT+IT:	7.2	7.7	110.8	694.0
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<div>Cost per Person-Month</div> <table border="1"> <tbody> <tr> <td>Requirements</td> <td>\$ 15000</td> <td><input type="checkbox"/> Inherit RQ</td> <td><input type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> <tr> <td>Product Design</td> <td>\$ 8000</td> <td><input type="checkbox"/> Inherit PD</td> <td><input type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> <tr> <td>Detailed Design</td> <td>\$ 9000</td> <td><input type="checkbox"/> Inherit DD</td> <td><input type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> <tr> <td>Code & Unit Test</td> <td>\$ 25000</td> <td><input type="checkbox"/> Inherit CT</td> <td><input type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> <tr> <td>Integration & Test</td> <td>\$ 13000</td> <td><input type="checkbox"/> Inherit IT</td> <td><input type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> <tr> <td>Maintenance</td> <td>\$ 6750</td> <td><input type="checkbox"/> Inherit MN</td> <td><input checked="" type="checkbox"/> Use Rates Tab & Labor Distribution</td> </tr> </tbody> </table>																								Requirements	\$ 15000	<input type="checkbox"/> Inherit RQ	<input type="checkbox"/> Use Rates Tab & Labor Distribution	Product Design	\$ 8000	<input type="checkbox"/> Inherit PD	<input type="checkbox"/> Use Rates Tab & Labor Distribution	Detailed Design	\$ 9000	<input type="checkbox"/> Inherit DD	<input type="checkbox"/> Use Rates Tab & Labor Distribution	Code & Unit Test	\$ 25000	<input type="checkbox"/> Inherit CT	<input type="checkbox"/> Use Rates Tab & Labor Distribution	Integration & Test	\$ 13000	<input type="checkbox"/> Inherit IT	<input type="checkbox"/> Use Rates Tab & Labor Distribution	Maintenance	\$ 6750	<input type="checkbox"/> Inherit MN	<input checked="" type="checkbox"/> Use Rates Tab & Labor Distribution		
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Activity report:

Estimate1 - Activity Report							
SystemStar 3.0 Demo		November 8, 2018		02:09:56		Page: 1	
Estimate Name: Estimate1		Estimate ID:					
Model Name: COCOMO® II 2000		Model ID: 2000					
Process Model: COCOMO® II Model		Phases: Waterfall					
	Effort in Person-Months						
Activity	RQ	PD	DD	CT	IT	Total RQ to IT	MN
Requirements	0.2	0.1	0.1	0.1	0.0	0.6	0.0
Product Design	0.1	0.5	0.1	0.2	0.1	1.0	0.0
Programming	0.0	0.1	1.0	1.4	0.5	3.0	0.0
Test Plans	0.0	0.1	0.1	0.1	0.0	0.3	0.0
V & V	0.0	0.1	0.1	0.2	0.4	0.8	0.0
Project Office	0.1	0.1	0.1	0.2	0.1	0.6	0.0
CM/QA	0.0	0.0	0.1	0.2	0.1	0.4	0.0
Manuals	0.0	0.1	0.1	0.1	0.1	0.5	0.0
Totals	0.5	1.1	1.8	2.4	1.4	7.2	0.0

Cost and Breakage Report:

Estimate1 - Cost & Breakage Report							
SystemStar 3.0 Demo		November 8, 2018		02:08:56		Page: 1	
Estimate Name: Estimate1		Estimate ID:					
Model Name: COCOMO® II 2000		Model ID:		2000			
Process Model: COCOMO® II Model		Phases:		Waterfall			
Increment 1 of 1							
Names of Leaf Components	Developed Size	RQ Cost	PD Cost	DD Cost	CT Cost	IT Cost	Total Cost (K\$)
Component1	5,000	7.1	9.2	16.1	60.6	17.9	110.8
Incr 1 Total	5,000	7.1	9.2	16.1	60.6	17.9	110.8
Grand Total	5,000	7.1	9.2	16.1	60.6	17.9	110.8

Cost driver report and Cost Report:

Estimate1 - Cost Driver Report																							
SystemStar 3.0 Demo					November 8, 2018					02:12:15					Page: 1								
Estimate Name: Estimate1										Estimate ID:													
Model Name: COCOMO® II 2000										Model ID: 2000													
Process Model: COCOMO® II Model										Phases: Waterfall													
Component Name			EAF			A	A	C	D	P	R	R	S	S	T	T	P	L	P	S	P	D	
			C	P	P	A	C	E	U	C	T	I	O	L	T	C	I	P	V	O	C		
Component1			0.4390	H	VH	N	N	H	N	N	N	N	N	H	H	H	H	H	H	H	L		

Estimate1 - Cost Report						
SystemStar 3.0 Demo		November 8, 2018		02:04:03		Page: 1
Estimate Name:	Estimate1			Estimate ID:		
Model Name:	COCOMO® II 2000			Model ID:	2000	
Process Model:	COCOMO® II Model			Phases:	Waterfall	
Cost per Component (K\$)						
Component Name	RQ	PD	DD	CT	IT	Total RQ to IT
Component1	7.1	9.2	0.0	60.6	17.9	94.8
Cost Summary						
Component Totals	7.1	9.2	0.0	60.6	17.9	94.8
Grand Total	7.1	9.2	0.0	60.6	17.9	94.8

Detailed report:

Estimate1 - Detail Report				
SystemStar 3.0 Demo		November 8, 2018 02:12:02		Page: 1
Estimate Name:	Estimate1	Estimate ID:		
Model Name:	COCOMO® II 2000	Model ID:	2000	
Process Model:	COCOMO® II Model	Phases:	Waterfall	
Component Name:	Component1	Component ID:		
Increment:	1	Level:	1	
Developed Size:	5,000	EAF:	0.4390	
Phase	Effort (Person-Months)	Cost (K\$)	Duration (Months)	Staffing
RQ -- Requirements	0.5	7.1	1.1	0.4
PD -- Product Design	1.1	9.2	1.6	0.7
DD -- Detailed Design	1.8	16.1	1.5	1.2
CT -- Code & Unit Test	2.4	60.6	2.0	1.2
IT -- Integration & Test	1.4	17.9	1.4	1.0
Development (PD+DD+CT+IT)	6.7	103.8	6.5	
Totals (RQ+PD+DD+CT+IT)	7.2	110.8	7.7	
MN -- Maintenance (per year)	0.0	0.0		0.0

Effort and breakage report and Increment detail report:

Estimate1 - Effort & Breakage Report							
SystemStar 3.0 Demo		November 8, 2018		02:10:14		Page: 1	
Estimate Name:	Estimate1			Estimate ID:			
Model Name:	COCOMO® II 2000			Model ID:	2000		
Process Model:	COCOMO® II Model			Phases:	Waterfall		
Increment 1 of 1							
Names of Leaf Components	Developed Size	RQ Effort	PD Effort	DD Effort	CT Effort	IT Effort	Total Effort
Component1	5,000	0.5	1.1	1.8	2.4	1.4	7.2
Incr 1 Total	5,000	0.5	1.1	1.8	2.4	1.4	7.2
Grand Total	5,000	0.5	1.1	1.8	2.4	1.4	7.2

Estimate1 - Increment Detail Report						
SystemStar 3.0 Demo		November 8, 2018	02:37:40			
Page: 1						
Estimate Name:	Estimate1	Estimate ID:				
Model Name:	COCOMO® II 2000	Model ID:	2000			
Process Model:	COCOMO® II Model	Phases:	Waterfall			
Increment:	1 of 1	Milestone in previous increment:	--			
SLOC subtotal for this increment:	5,000	Starting point, each increment:	PDW			
Breakage SLOC:	0	Breakage (previous SLOC Modified):	--			
Total SLOC developed in this increment:	5,000					
Phase	Effort in Person-Months	Cost (K\$)	Delay Before	Start Month	Months	Stop Month
RQ -- Requirements	0.5	7.1	0.0	0.0	1.1	1.1
PD -- Product Design	1.1	9.2	0.0	1.1	1.6	2.7
DD -- Detailed Design	1.8	16.1	0.0	2.7	1.5	4.2
CT -- Code & Unit Test	2.4	60.6	0.0	4.2	2.0	6.2
IT -- Integration & Test	1.4	17.9	0.0	6.2	1.4	7.7
Total (RQ+PD+DD+CT+IT)	7.2	110.8		0.0	7.7	7.7

Schedule Report:

Estimate1 - Schedule Report									
SystemStar 3.0 Demo			November 8, 2018		02:38:00		Page: 1		
Estimate Name:		Estimate1				Estimate ID:			
Model Name:		COCOMO® II 2000				Model ID:		2000	
Process Model:		COCOMO® II Model				Phases:		Waterfall	
Month	Effort this Month (Person-Months)						Cumulative Effort	Cost (K\$) This Month	Cumulative Cost (K\$)
	RQ	PD	DD	CT	IT	Total			
1	0.4	0.0	0.0	0.0	0.0	0.4	0.4	6.4	6.4
2	0.0	0.6	0.0	0.0	0.0	0.7	1.1	5.8	12.1
3	0.0	0.5	0.3	0.0	0.0	0.8	2.0	7.1	19.3
4	0.0	0.0	1.2	0.0	0.0	1.2	3.1	10.7	29.9
5	0.0	0.0	0.3	0.9	0.0	1.2	4.3	25.6	55.6
6	0.0	0.0	0.0	1.2	0.0	1.2	5.5	29.9	85.4
7	0.0	0.0	0.0	0.3	0.7	1.0	6.6	17.0	102.5
8	0.0	0.0	0.0	0.0	0.6	0.6	7.2	8.4	110.8

5. ASSUMPTIONS AND CONSTRAINTS

5.1 ASSUMPTIONS

The following is a list of assumptions:

- Customers must be 18 years or older.
- Average 10000 request per day. At least 100 users should be able to access the system altogether at any given time.
- System remains accessible 24/7 to the admin and only during the office hours to the employees.
- At least 20 transactions should be committed by the databases at the same time and should give correct state of the database.
- Products prices will be inclusive of all the taxes.
- Standard USPS delivery with a flat rate.
- There are no network issues.
- Employees receive no vacations during these 3-month project period.
- Client has no DB, no servers.
- The Manager, developers and testers are the amongst the cream of the industry. They are well experienced, know how to get around the software and get the job done. Therefore, is no learning or exploring technology indicated anywhere in the project plan.
- All the tasks are 100% completed at the said date and time.
- The Source code is available from their previous projects and modification to the code is done for the Healthline Networks project. Hence time allocated to each task is keeping in mind of the code availability.

5.2 CONSTRAINTS

The following is a list of constraints:

- Aggressive time schedule
- Employees should work on weekends if necessary.

6. COST AND DURATION ESTIMATE

Project Management - 68 days. This will encompass constant client feedback on the deliverables as well as continuous client feedback.

In the above schedule I have considered weekends and public holidays. The estimated cost for this project is \$500,000 and the profit earned is \$214, 217.

6.1 COST ESTIMATE

The cost estimate will take into account several factors:

COCOMO Estimate	\$110800	
Building Space	\$42700	@ \$6100pm
Resources Cost	\$12025.54	
Paid Vacation for team for 1 week	\$6250	
Total	\$171775.54	
25% overhead cost	\$42943.885	
Cost including overhead cost	\$214719.425	
Profit @ 50%	\$107359.5	
<hr/>		
Cost including Profit	\$322078.925	

6.2 DURATION ESTIMATE

The duration of the project will take into account the factors:

COCOMO Estimate	7.7 months
Vacation for each team member	1 week
Total vacation for whole team	1.25 months
<hr/>	
Total duration for the project	8.95 months

7. CONCLUSION AND RECOMMENDATIONS

United Healthline Networks is a small company located in Arlington, Texas. In order to help their clients, keep track of personal health-related data, they have approached our team to create a website and an Android application. This document gave a feasibility study for the same. Though there are certain risks related to the project like having the host provider server crash, Database crash or Fraud in transactions. However, there are many benefits as well such as helping customers monitors their health stats on the go, the revenue of the company is increased and opportunity to acquire new clients.

The duration of the project would be **8.95 months**. It is not feasible to complete the project within 3 months of given time period due to the functionalities and expected size of the project. The coding and testing phase of the project will consume maximum of the time. We would be a team of 6 people out of which 2 would be programmers, 2 testers and 1 designer and 1 project manager. The project is estimated to cost **\$322078.925** which includes all the costs to the company and profit at 50%.

A recommendation would be: Since the time schedule is very aggressive and ambitious, we could rather provide the main functionalities than all the functionalities at once. We could understand the customer response and the market behavior and then decide to provide all the additional functionalities rather than providing the complete software as one.

I also recommend using the RAD model [11] (Rapid Application Development) model, an incremental model. In RAD model the components or functions are developed in parallel as if they were mini projects. The developments are time boxed, delivered and then assembled into a working prototype.

I would also recommend the team to use Apache Cordova for building the website and Mobile application.

APPENDICES:

1. Waterfall Model <http://tryqa.com/what-is-waterfall-model-advantages-disadvantages-and-when-to-use-it/>
2. CHEAPEST MACBOOK AVAILABLE <HTTPS://WWW.BESTBUY.COM/SITE/APPLE-MACBOOK-PRO-13-DISPLAY-INTEL-CORE-I5-8-GB-MEMORY-128GB-FLASH-STORAGE-SILVER/5721726.P?SKUId=5721726&REF=212&LOC=1&GCLID=CJWKCAJWIO3dBRAQEiWAHWsNVS7IEiPC4ZMX6wEXGNADb MEIDXH 4uZYbZi7N4BQPI9V4EUzCo34BoC1G8QAvD BWE&GCLS RC=AW.DS>
3. Dell Inspiron <https://www.amazon.com/Dell-Inspiron-i7559-2512BLK-Generation-GeForce/dp/B015PYZ0J6>
4. Visual Studio <https://www.visualstudio.com/vs/pricing/>
5. Telerik reporting <http://www.telerik.com/purchase/individual/reporting.aspx>
6. GoDaddy <https://www.godaddy.com/tlds/net-domain?isc=gofd2001aj>
7. <https://www.oho.com/blog/hospital-website-design-meeting-prospective-patients-content-needs>
8. <https://www.vitaminshoppe.com/>
9. <https://developer.android.com/studio/>
10. <https://www.mysql.com/>
11. <http://tryqa.com/what-is-rad-model-advantages-disadvantages-and-when-to-use-it/>
12. <https://cordova.apache.org/>
13. Waterfall model image source: <https://www.mbaskool.com/business-concepts/it-and-systems/8658-waterfall-model.html>
14. COCOMO tool used [Sytemstar](#)