

Project Evaluation
Organization-Wide Alert System

For
CS 895 MSE Project
Department of Computer Science
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1. **Introduction**

This document contains a personal evaluation of the process and methodologies. It compares my estimations for time and lines of code to the actual final values. It analyzes my time log by Phase and activity. And finally it reviews the successfulness of the final product.

2. **Process Review**

I used a prototyping process for this project. At each phase the prototype was presented to committee members and stakeholders, the objectives were refined, and a period of development followed. The process was iterative and each iteration resulted in a more refined product.

There were three phases. The first phase involved establishing a clear vision of what I wanted to create. The second phase solidified the architectural details and requirements. The third phase involved testing, deployment, and finalizing of documentation.

2.1. **Usefulness of Methodologies**

My final product has an entirely different architecture and a substantially different feature set than my original prototype. The iterative nature of this process was very useful in helping to establish the need for these changes at the right time in the process. The prototyping allowed me to get feedback and catch problems early in the process when they were still minor.

The documentation, particularly the Project Plan and Vision Document were particularly useful for establishing scope and creating time estimates. This came into play when testing the prototype with actual users. Several people had suggestions for further features or functionality changes, but having clearly defined requirements helped keep the project on track. Likewise, with the COCOMO II estimate, I was able to give stakeholders estimates on when to expect deliverables.

As I intend for this to be an open source project, the Architecture and Component diagrams will be very useful in onboarding future collaborators. In one of the prototypes, the functionality worked correctly, but in looking at the architecture from a more generalized perspective I realized that refactoring some classes for clarity would really help make the code more understandable.

The Formal Technical Inspections were particularly useful because during the process I got feedback on my UI from experienced UI designers. This resulted in several major changes to the Web GUI.

3. **Problems Encountered** **Schedule**

By far the biggest problem encountered was keeping on schedule. My initial project estimates didn't take into account several other projects taking higher priority. I found

that having a clear schedule estimate helped keep me on task.

Deployment Issues

Because of the nature of the project I found that several people/companies were interested in implementing the final product. I had difficulty managing expectations and communicating the process. For people not familiar with the software process, they don't necessarily understand why they shouldn't fully deploy the beta prototype to all computers. Or what changes/features are reasonable and which would require significant time or redesign. They struggled with deployment issues, and questions about the functionality and limits thereof.

However, I was glad to have the opportunity, because in addition to discovering several bugs and giving me feedback on design elements they wanted altered, I was able to get a feel for they types of problems someone might have deploying it. For instance, I learned that most users do not have Java installed, where I had made an assumption that they did. I also learned that many people still use a 32 bit operating system, and had to recompile and reconfigure the program to work with Windows XP.

Encryption

A major problem encountered was password encryption. In the original design did not include security - the system was open to anyone with the IP address. Password authentication was implemented Phase II and was originally sent in plain text as a parameter of the Rest Call. It was suggested in the Phase II presentation that the passwords be encrypted before being transmitted. This presented a problem because it's very difficult to encrypt a password in Java and encrypt the same password in PHP and have those encryptions be compatible. It took several days of researching to find a method that would work, and that added to the overall schedule

4. Estimation Accuracy

Regarding the schedule, the estimated and actual timelines only differed by about 13 days.

The required man-months estimate of 7.09 was slightly underestimated but by only 1 month.

The COCOMOII estimate had a SLOC estimation of 5300. The actual SLOC was 3876. So it was slightly over-estimated, but not by orders of magnitude, and the complexity was slightly underestimated which resulted in the schedule estimate to being so accurate.

5. Engineering Notebook

I recorded 207.5 actual hours working on the project. I believe that I missed quite a bit of time as keeping a time log is not something that comes naturally to me. So there were quite a few days where I forgot to record my time. But overall I believe I got enough

recorded to constitute a random sample, so I believe the percentages listed below are correct, even if the actual hours are under-reported.

Time by Phase

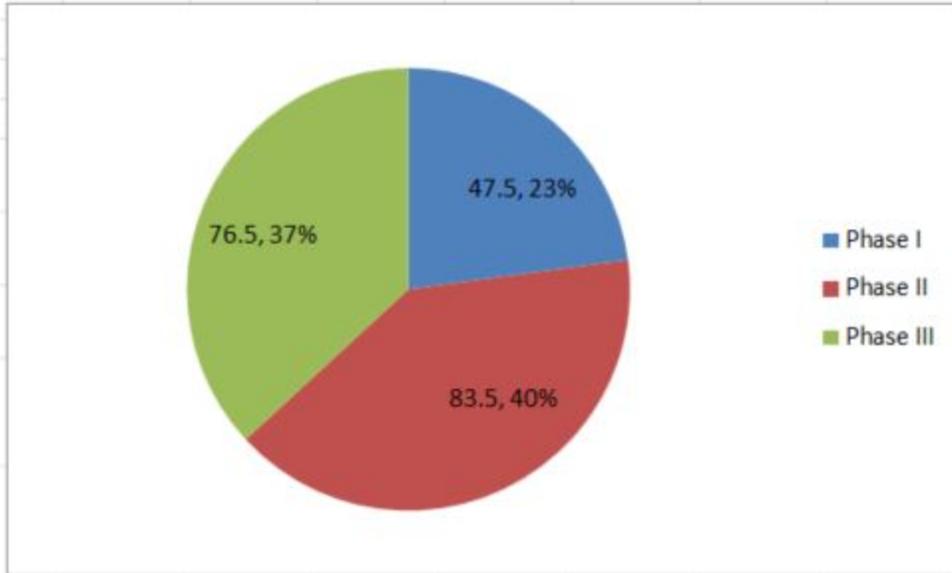


Fig 5.1 - The percentage of time spent in each Phase.
The majority of time was spent in Phases II and III. Phase I

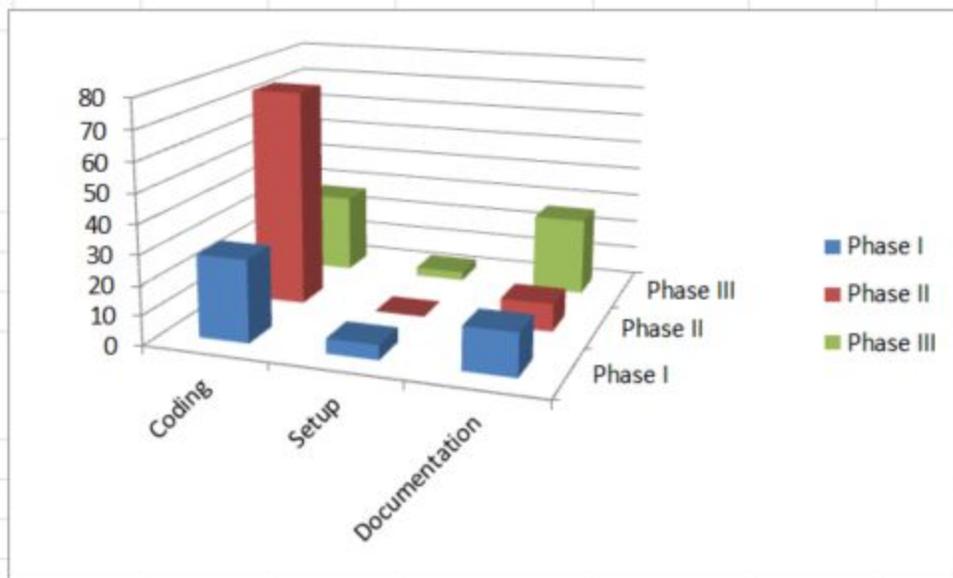


Fig 5.2 - The of time spent on each activity in each phase
While Phases I and III were equal parts coding and documentation, Phase II had significantly more coding than any other activity.

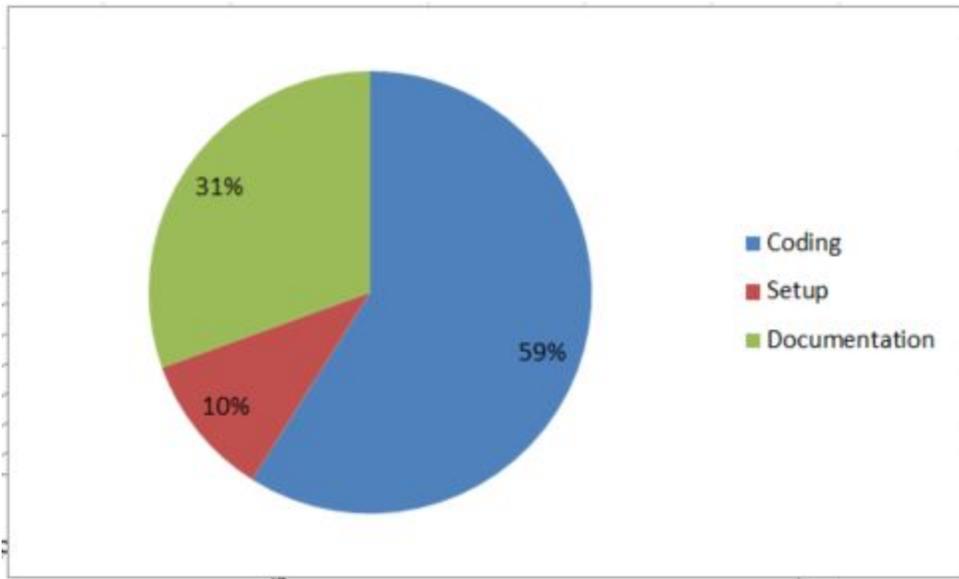


Fig 5.3 - Phase I activity breakdown.

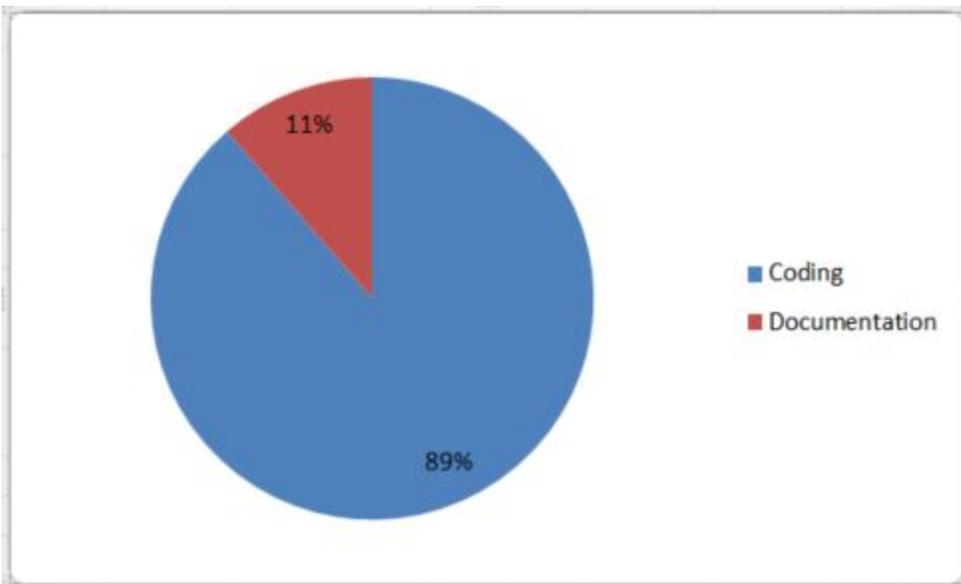


Fig 5.4 - Phase II activity breakdown

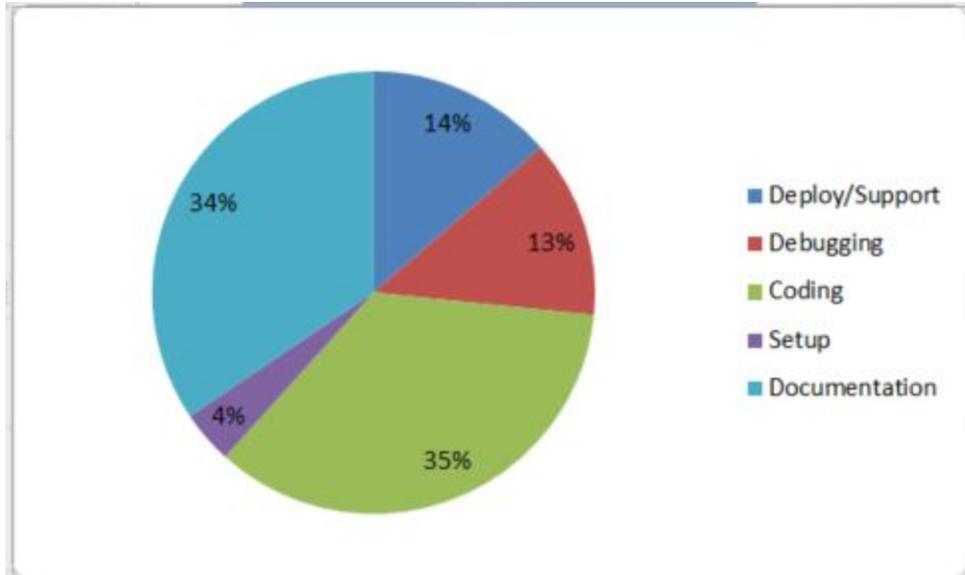


Fig 5.5 - Phase III activity breakdown

Data	Start	Stop	Interrupt	Delta (min.)	Task	Comments	Phase I	
Pre Oct Est.					24:00:00	Coding	Log not started until Oct	Phase I
10/7/2018	10:00:00 AM	3:30:00 PM	1:20:00 AM		4:10:00	Coding	Worked on Prototype	Phase I
10/14/2018	10:00:00 AM	3:30:00 PM		1:00	4:30:00	Documentation	Completed Vision Document	Phase I
10/21/2018	10:00:00 AM	7:22:00 PM		1:00:00	8:22:00	Documentation; website	Completed Project Plan	Phase I
10/28/2018	10:00:00 AM	12:00:00 PM		0	2:00:00	Documentation	Completed SQA Plan	Phase I
11/4/2018	10:00:00 AM	4:00:00 PM		1:00:00 AM	5:00:00	Setup	Setup Raspberry Pi	Phase I
11/8/2019	3:00:00 PM	4:00:00 PM			1:00:00	Presentation	Phase I Presentation	Phase I
11/11/2019	8:00:00 AM	2:00:00 PM		0:30	5:30:00	Coding	Server	Phase II
11/18/2019	4:00:00 PM	10:00:00 PM		0	6:00:00	Coding	Server	Phase II
1/2/2019	5:00:00 PM	9:00:00 PM		1:00:00 AM	3:00:00	Coding	Server	Phase II
1/6/2019	9:00:00 AM	3:30:00 PM		1:30:00 AM	5:00:00	Documentation; Coding	Completed Phase 1 Action Items	Phase II
1/13/2019	9:00:00 AM	4:00:00 PM		2:00:00 AM	5:00:00	Coding	Client	Phase II
1/16/2019	5:00:00 PM	11:00:00 PM		12:00:00 AM	6:00:00	Coding	Client	Phase II
1/20/2019	9:00:00 AM	8:00:00 PM		2:00:00 AM	9:00:00	Coding	Client	Phase II
1/23/2019	5:00:00 PM	9:00:00 PM		0	4:00:00	Coding	Server	Phase II
1/27/2019	9:00:00 AM	9:00:00 PM		1:30:00 AM	10:30:00	Coding	Client; Server	Phase II
2/3/2019	10:30:00 AM	5:00:00 PM		1:00:00 AM	5:30:00	Coding	Client; Server	Phase II
2/10/2019	9:00:00 AM	3:30:00 PM		1:30:00 AM	5:00:00	Documentation; Coding	Completed FRS	Phase II
2/12/2019	5:00:00 PM	10:00:00 PM		12:30:00 AM	4:30:00	Documentation; Coding	Completed Architecture Design Doc	Phase II
3/11/2019	5:00:00 PM	10:00:00 PM		12:30:00 AM	4:30:00	Documentation; Coding	Completed Test Plan and Checklist	Phase II
3/14/2019	5:00:00 PM	9:00:00 PM		1:00	3:00:00	Coding	Client	Phase II
3/17/2019	10:00 AM	4:00:00 PM		2:00:00 AM	4:00:00	Coding	Client	Phase II
3/20/2019	7:00:00 PM	10:00:00 PM		0	3:00:00	Coding	Server	Phase II
3/25/2019	12:00:00 PM	1:00:00 PM			1:00:00	Presentation	Phase II Presentation	Phase II
3/24/2019	4:00:00 PM	11:00:00 PM		1:00	6:00:00	Deploying	Deployed to Sunshine Meadows	Phase III
3/25/2019	8:00:00 AM	10:00:00 AM			2:00:00	Support	Supporting new users	Phase III
3/27/2019	9:00:00 AM	9:30:00 AM			0:30:00	Support	Supporting new users	Phase III
3/30/2019	8:00:00 AM	10:00:00 PM		4:00:00 AM	10:00:00	Debugging	Debugging reported bugs from users	Phase III
3/31/2019	10:00:00 AM	12:00:00 PM			2:00:00	Deploying	Redeploying to affected users	Phase III
4/2/2019	5:00:00 PM	9:00:00 PM			4:00:00	Coding	Begin Version 2	Phase III
4/11/2019	10:00:00 AM	9:00:00 PM			3:00:00	Coding	fixing encryption issues	Phase III
4/18/2019	10:00:00 AM	9:00:00 PM		3:00	8:00:00	Coding	fixing system 32 problems	Phase III
4/23/2019	7:00:00 PM	10:00:00 PM			3:00:00	Coding	creating install scripts	Phase III
4/26/2019	10:00:00 AM	3:00:00 PM			5:00:00	Documentation	updating phase II documents	Phase III
4/29/2019	6:00:00 PM	9:00:00 PM			3:00:00	Setup	Getting system ready for reviewers	Phase III
5/1/2019	4:00:00 PM	8:00:00 PM			4:00:00	Coding	Refactored program based on feedback	Phase III
5/2/2019	3:00:00 PM	10:00:00 PM			7:00:00	Coding	Refactor - add features	Phase III
5/4/2019	10:00:00 AM	10:00:00 PM		3:00:00 AM	9:00:00	Documentation	Assesment Eval	Phase III
5/5/2019	9:00:00 AM	10:00:00 PM		4:00:00 AM	9:00:00	Documentation	Component Design Document; Action Items	Phase III
5/6/2019	5:00:00 PM	10:00:00 PM		0:30	4:30:00	Documentation	User Manual	Phase III
5/7/2019	5:00:00 PM	10:00:00 PM		0:30	4:30:00	Documentation	website updates, eval	Phase III

Fig 5.6 - Time Log

6. **Product Effectiveness and Quality**

The project successfully produced a product which met the requirements specified in the original design. It has been well received in its initial deployment.

The design is well documented and code is well commented, and I think future collaborators will have an easy time understanding it. The Rest API functions exist separately from the Web GUI, so I believe loose coupling was achieved.

Overall I'd say this project is a success and will only continue to improve in future iterations.

7. **References**

Kuppa, K. (n.d.). Airline Reservation System [Scholarly project]. Retrieved from [http://people.cs.ksu.edu/~kaavya/Vision Document_MSE_Phase I.pdf](http://people.cs.ksu.edu/~kaavya/Vision_Document_MSE_Phase_I.pdf)

Lastrapes, J. RCRA Enforcement and Compliance History (REACH) System (2018)