THE UNIVERSITY OF SYDNEY

School of Information Technologies
Faculty of Engineering & IT

ASSIGNMENT/PROJECT COVERSHEET - GROUP ASSESSMENT

Unit of Study: INFO6007

Assignment name: Project Management in IT

Tutorial time: 6:00 - 9:00 pm **Tutor name:** Mr Srinivas Varanasi

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We realise that we may be asked to identify those portions of the work contributed by each of us and required to demonstrate our individual knowledge of the relevant material by answering oral questions or by undertaking supplementary work, either written or in the laboratory, in order to arrive at the final assessment mark.

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I. Summary of Sciebo

Sciebo is a joint project of Sync & Share, a consortium of 22 universities in NRW, Germany. This project is to build and operate a cloud storage solution which, unlike commercial services, guarantees that the data remains within the sovereignty of the participating universities at all times.

In addition to the special security guarantee, Sciebo also meets the same demanded as commercial services like Dropbox. With 30 GB of free storage for every student and employee, Sciebo is the jumbo of cloud storage. Meanwhile, synchronization between the web and multiple devices as well as share with fellows or third-party joint people functions are implemented in Sciebo.

This project is now a success with over 500,000 users among 22 universities.

II. Scope Management

A. Scope Statement

1) Objective: Construct a non-commercial cloud storage service for research, studying and teaching for 500,000 users of 22 universities in NRW in no more than 3 years .This project should achieve functions including:

- *Sync*: data synchronization for different device types with the various operating platforms
- *Share*: joint work on documents and data sharing between inter-university or external parties
- *Consistence*: data remain within the sovereignty of the participating universities at all times

2) Deliverable: During and at the end of this project, several deliverables should be completed.

- PM chart provides the result of a background survey and research, gives at least scope, cost, resources, and time plan
- A server center installed 5 IBM GPFS Storage Server GSS26 with 5 petabytes storage volume
- Apps on multiple platforms, including iOS, Android, Windows, Mac OS, Linux and web interface allowing share between devices and accounts ("Sync"), and joint editing ("Share")
- Web interface for the project and user guide

3) Team and locations: Center for Applied Information Technology (ZIV) of Muenster University leads this project. Another 10 universities and 14 universities of applied sciences in NRW jointly work on this. This project is located in Münster, Bonn, Duisburg-Essen.

4) Requirements:

- Meet the same demands as commercial services, like Dropbox.
  In particular, Sciebo should provide data synchronization function for different device types with the various operating system. Besides, share function should be implemented.
- Enable inter-university cooperation as well as data sharing with external parties.
  This is to satisfy the academic needs of university students or staff to share learning materials and research data. The third party should also have a guest account in order to take part in conferences or forums.
- Offer sufficient data storage volume.
  Since there may involve different data including text, images, video, etc. The project should provide sufficient storage space for users. According to previous research and survey, 5 petabytes is required in total.
- Establish adequate support structure for both experienced users and new users.
  Though the cloud storage service is widely accepted nowadays, there are still people without knowledge of this area. On one hand, sufficient function and guide should be here to help experienced user migrating from current service to Sciebo; on the other hand, detailed user books should guide brand new user adopting this service.
- Guarantee that the data remains within the sovereignty of the participating universities at all times
  This is to make sure that the stored data is strictly maintained by the universities which avoid copyright or security problems instead of using commercial cloud storage service

5) User Acceptance Criteria:

- All data are maintained in the data center of involved universities.
- Enough storage is allocated to users.

- Applications on device types and operating systems are developed.
- A friendly web interface for this project is established.
- Required documents and guidebooks for users are written.

B. Work Breakdown Structure

see Appendix WBS part(along with Gantt chart).

III. Time

A. Gantt Chart and Network Diagram(AON)

see Appendix the AON chart part.

B. Project milestones

- **Milestone 1**: discussion with other universities
  Specific: The communication with other universities is the last task of market research which the project collect some advises and understand the potential market and potential customers.
  Measurable: The project needs to understand the aims and functions of the cloud service. And what the commands of potential customers.
  Agreed: It is necessary to understand the potential market for the cloud service, include: functions, commands, and services provided.
  Realistic: It is important to collect enough information on the technology and market within 309 days with necessary statistics and communication skills.
  Time: Tue 8/13/13
- **Milestones 2**: create risk plan
  Specific: After this task is finished, most of the risk of the project from both external and inside of the project is known and understood by the project team. It also means planning sector is over.
  Measurable: By the end of this charter, the team has a schedule of the project and know clearly that how to execute the project and what aims should be done.
  Agreed: It is important and necessary to create statements of the project, which can help the project to be successful. Realistic: All the statements should be created and agreed within 162 days. The Project Management knowledge is necessary for this charter to estimate and arrange the project.
  Time: Thu 3/27/14
- **Milestones 3**: testing migration
  Specific: This task tests the cloud service with both hardware and software. Then, the cloud service is available.
  Measurable: The team should install the platform of cloud service, and this platform can be primarily applied, which means most of the functional tests are finished.
  Agreed:The core system should be tested several times and make sure that all the designed functions can be applied.
  Realistic: Within 106 days, the platform of cloud service should be ready to offer services. Many technology skills are needed in this sector, such as data mining algorithm, data transmit, network connection, distributed system, and electronic engineering.
  Time: Fri 8/22/14
- **Milestones 4**: upload website
  Specific: The cloud service and its web application can be available by customers. All the hardware and software are ready to offer services.
  Measurable: The platform of cloud service should be available by customers through website application. Agreed: This is an important step of the project which means most of the tasks are finished.
  Realistic: Within 86 days, the platform and website application of cloud service can be uploaded online. Many website development skill and communication skill are needed in this sector.
  Time: Wed 12/12/14

C. Critical path

After setting duration for each task, we identified the critical path that shows the earliest time by which the project can be completed. At the beginning of the project, the team need to identify the “market research (ID 3)”, and then getting analysis results by “results analysis (ID 12)”. To make sure that the idea is good enough and try to find potential users, the team will have “discussion with other universities (ID 17)”. After that, the team will “create scope statement (ID 20)” and “Gantt chart (ID 22)”, following by that is to “create cost plan (ID 23)”. In the third sector, the team wants to “install hardware (ID 26)” to build the structure of cloud driver. Then “verify cluster installation (ID 40)” will be executed. With the hardware and software, the team will get “apache – add more servers (ID 49)” done. The software development company receives the requirement document from the team and began to “design website (ID 75)”, after that the company will send staffs to offer “training service (ID 97)”. At the end of the project, the team needs to “finalize billing schedules (ID 108)”, and start to “evaluate project (ID 111)”. Finally, all the tasks are finished, and the team will “celebrate (ID 113)”.

IV. Cost

A. Cloud Storage Service Project Cost Estimate(7/06/12 - 29/01/15)

Task Name	Units/Hrs.	Cost/Unit/ Hr.	Subtotals (Internal costs)	Units/Hrs.	Cost/Unit/ Hr.	Subtotals (External costs)	WBS Level 2 Totals	% of Total
Build a Cloud Storage Service Project								
1 Initiation							$803,600.00	19.26%
1.1 Market research	80000	$8.00	$840,000.00	20000	$5.00	$100,000.00		
1.2 Results analysis	5000	$8.00	$40,000.00	1160	$5.00	$5,800.00		
1.3 Discussion with other universities	1000	$8.00	$8,000.00	1960	$5.00	$9,800.00		
2 Planning							$505,120.00	12.11%
2.1 Create requirements tracebility matrix	3200	$41.00	$131,200.00					
2.2 Create scope statement	1600	$41.00	$65,600.00					
2.3 Create work break down structure	800	$41.00	$32,800.00					
2.4 Create gantt chart	800	$41.00	$32,800.00					
2.5 Create cost plan	2400	$41.00	$98,400.00					
2.6 Create risk plan	3520	$41.00	$144,320.00					
3 Execution							$1,897,400.00	45.48%
3.1 Install hardware	3000	$24.00	$72,000.00	2440	$18.00	$43,920.00		
3.2 Install system	4680	$24.00	$112,320.00					
3.3 Verify Cluster Installation	2480	$24.00	$59,520.00					
3.4 Creating an Active Cluster	3120	$24.00	$74,880.00					
3.5 Apache - Add more servers	6960	$24.00	$167,040.00					
3.6 Corporate requirement	6360	$24.00	$152,640.00					
3.7 Website design	6000	$13.00	$78,000.00	1480	$8.00	$11,840.00		
3.8 Coding	6000	$13.00	$78,000.00	520	$8.00	$4,160.00		
3.9 Other service	1640	$13.00	$21,320.00					
3.10 Adv for cloud service	1360	$16.00	$21,760.00	200	$5,000.00	$1,000,000.00		
4 Monitoring & Control							$949,600.00	22.76%
4.1 Performance monitoring	30000	$17.00	$510,000.00	22400	$10.00	$224,000.00		
4.2 Team review meetings	10000	$17.00	$170,000.00	4560	$10.00	$45,600.00		
5 Closing							$16,340.00	0.39%
5.1 Finalise biling schedules	240	$13.00	$3,120.00					
5.2 Finalise project doc.	160	$13.00	$2,080.00					
5.3 Transfer responsibility for deliverables	240	$13.00	$3,120.00					
5.4 Evaluate project	320	$13.00	$4,160.00					
5.5 Release resources	160	$13.00	$2,080.00					
5.6 Celebrate	60	$13.00	$780.00	100	$10.00	$1,000.00		
Total							$4,172,080.00	100.00%

Hardware			
Database servers	12	$400.00	$4,800.00
Apache web frontend server	48	$400.00	$19,200.00
LVS network load-balancers with keepalive	6	$6,649.00	$39,894.00
GPFS Storage Server system	3	$898.00	$2,694.00
Management server for administrative	3	$400.00	$1,200.00
10 Gbps Ethernet for IP traffic	3	$248.00	$744.00
56 Gbps FDR infiniband	3	$100.00	$300.00
Lenovo Laptop	50	$1,496.00	$74,800.00
Total			$143,632.00

B. Cloud Storage Service Project Cost Baseline (7/06/12 - 29/01/15)

Task Name	2nd Semester in 2012	1st Semester in 2013	2nd Semester in 2013	1st Semester in 2014	2nd Semester in 2014	1st Semester in 2015	WBS Level 2 Totals
Build a Cloud Storage Service Project							
1 Initiation							$803,600.00
1.1 Market research	$555,000.00	$185,000.00					
1.2 Results analysis		$45,800.00					
1.3 Discussion with other universities			$17,800.00				
2 Planning							$505,120.00
2.1 Create requirements tracebility matrix			$131,200.00				
2.2 Create scope statement			$32,800.00	$32,800.00			
2.3 Create work break down structure				$32,800.00			
2.4 Create gantt chart				$32,800.00			
2.5 Create cost plan				$98,400.00			
2.6 Create risk plan				$144,320.00			
3 Execution							$1,897,400.00
3.1 Install hardware				$115,920.00			
3.2 Install system				$112,320.00			
3.3 Verify Cluster Installation				$59,520.00			
3.4 Creating an Active Cluster				$74,880.00			
3.5 Apache - Add more servers					$167,040.00		
3.6 Corporate requirement					$152,640.00		
3.7 Website design					$89,840.00		
3.8 Coding					$82,160.00		
3.9 Other service					$21,320.00		
3.10 Adv for cloud service					$1,021,760.00		
4 Monitoring & Control							$949,600.00
4.1 Performance monitoring	$146,800.00	$146,800.00	$146,800.00	$146,800.00	$146,800.00		
4.2 Team review meetings				$107,800.00	$107,800.00		
5 Closing							$16,340.00
5.1 Finalise biling schedules						$3,120.00	
5.2 Finalise project doc.						$2,080.00	
5.3 Transfer responsibility for deliverables						$3,120.00	
5.4 Evaluate project						$4,160.00	
5.5 Release resources						$2,080.00	
5.6 Celebrate						$1,780.00	
Total	$701,800.00	$377,600.00	$328,800.00	$958,360.00	$1,789,360.00	$16,340.00	$4,172,080.00

C. Cost Monitoring

The project has already spend $2,413,687.20 by the second semester in 2014. In Planed cost schedule, it should be $2,366,360.00. The SPI is 0.97 which is less than one, this means less work has been completed than the planned work, and in other words, this project is behind schedule(Bagherpour et al. 2010), but not behind too much. The CPI is 0.95 which is less than one, it means the project is earning less than the amount spent until now, in other words, the project is under budget(Anbari 2003), but also it's not too much. ETC is indicated the date will be 767, which means the date will be finished be more 53 days. And the BAC is indicated how much the project expected the project to cost when it's complete which is $4,538,150.351(Lipke et al. 2009). Showed at Figure 1.

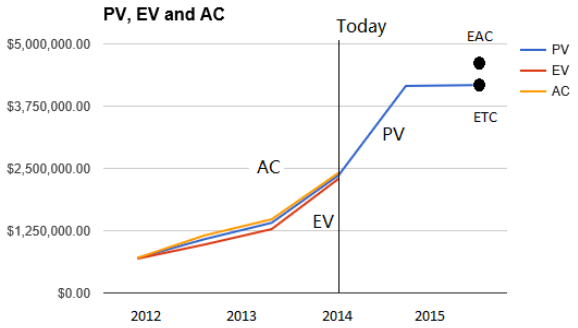

Fig. 1. The score of open data in each country

V. Risk

A. Risk Identification

No.	Risk Name	Category	Risk Owner	Probability	Impact
1	Budget lack	Finance	CFO, Financial department	0.4	0.6
2	Propaganda Lack	Propaganda	propaganda department	0.2	0.1
3	Hardware Broken	Finance/ Partnership	purchasing department	0.75	0.75
4	Lack of staff	HR	HR department	0.2	0.2
5	Pessimistic Group	HR	HR department	0.5	0.3
6	System Crashed	Technology	R&D department	0.6	0.8
7	Server Breakdown	Technology	R&D department	0.6	0.8
8	Internet Paralysis	External	Network supplier	0.5	1.0

Fig. 2. Risk Identification

The detailed descriptions of each risk are as following:

- Risk 1 Risk description: 1. The actual cost of the project is over budget. 2.The investors didn't offer adequate money for the project. Root cause: Budget estimation is inaccurate. Impact: The project

is forced to suspense until the financial problem solved.

- Risk 2 Risk description: The cloud service is created for universities, so the advertisements are necessary. However, the propaganda may be unable to reach the expect popularity. Root cause: 1.The advertisements have not be designed attractive enough. 2.The staff used wrong platform or wrong approach. Impact: 1. Low popularity. 2. Influence the utilization rate of the service
- Risk 3 Risk description: Hardware is damaged during the transportation process Root cause: 1.Carelessness of transportation company. 2. Inappropriate transportation approach 3. The weather problem such as rainy or snowy days. Impact: Serious funding lost, and the whole project delays. It is a remarkable fact that the hardware belongs to the scope of infrastructure construction and fixed assets. If any hardware is broken, it caused serious financial loss. That is the reason why risk 3 is defined as a part of the financial risk.
- Risk 4 Risk description: Since the project needs the cooperation of many universities for construction, the amount of the staff cannot satisfy the plan. Root cause: Inadequate human resource plan. Impact: Need more time for recruitment. Delaying the project.
- Risk 5 Risk description: Group members show the pessimistic attitude towards the work. Root cause: Self-sufficient or pessimistic working environment and atmosphere. Impact: Bring bad working atmosphere to the whole project
- Risk 6 Risk description: There are coding bugs which lead to the service system crashed. Root cause: Inadequate debug working before running the service system. Impact: Influence the reputation of the service and utilization rate.
- Risk 7 Risk description: Some of the servers breakdown during the using. Root cause: Technology problem, immature technology Impact: Some of the services are forced to suspense.
- Risk8 Risk description: All the cloud-based services needs the support of Internet. The network may be broken and paralyzed Root cause: This risk is an external risk caused by network supplier instead of the company itself. Impact: The project is forced to suspense. No service could be served.

B. Probability/Impact Matrix

The probability/Impact Matrix is shown below Fig.3

The probability/Impact Matrix is shown below. For the Probability of Failure: 0 - 0.3 is low; 0.3 - 0.7 is medium; 0.7 - 0.1 is high. For the Consequence of Failure: 0 - 0.3 is low; 0.3 - 0.7 is medium; 0.7 - 0.1 is high. Due to the project characteristics, the equipment for platform developing and the technology for platform supporting are the most important parts. So the impacts of these risks are quite serious. While another problem such as human resource management problem seems to be slight compared to the technology issues.

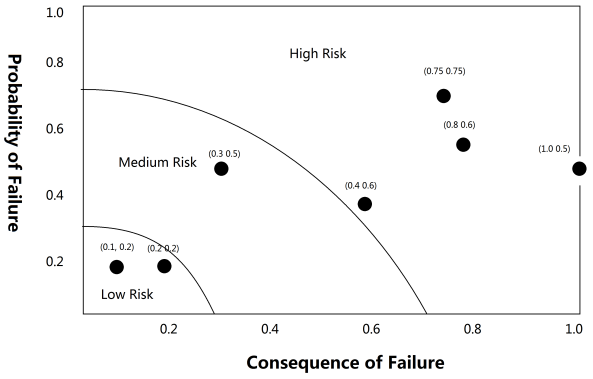

Fig. 3. The probability/Impact Matrix

Risks of a project cannot be eliminated, but some of the probability can be lowered. In order to make it achievable, several measures. 1. Improve the personal abilities of all the staff. 2. Appropriate rewards and punishments system. 3. Make a detailed standby plan and adequate budget support if any risk happens.

And this project finished with adequate budget and time indeed, which is the best evidence for the necessity of risk management in advance.

VI. Quality

A. Plan Quality Management

Quality management focuses on every visible deliverable of a project. Therefore, not all of the tasks are involved in quality issues and quality control and based on the principle, the checklist of the quality management plan has been proposed.

Task Name	Quality Criteria for the project
1.1 Market research	Sample size
1.2 Results analysis	Data reliability; Data analysis professionalism
1.3 Discussion with other universities	The amount of the cooperators
2 Planning	Integrated; Reasonable; Economical
3.1 Install hardware	Integrated; Intact ;
3.4 Creating an Active Cluster	Develop successfully
3.5 Apache - Add more servers	Service performance
3.7 Design website	Aesthetic; Functional
3.8 Write code for website	Performance
4.Monitoring	All the test passing

Fig. 4. Quality Assurance and auditing

For the project, the quality criteria mainly focus on the performance of the output product, and the feedback

from the users, because the quality of a service has depended on technology performance and users' experience. Considering factors above, the quality criteria is defined as is shown beside the quality management checklist.

B. Quality Assurance

For executing of the quality management, the tasks on the checklist has been divided into six phases.The details of the quality assurance after each phase is shown in the table below.

Phase	QA
Market researching and Analysis	Requirements review
Planning	Successful case in running
Installing	Hardware System and server review
Design	Design review
Development	Unit testing, Integration testing, Systems testing, Server testing, Internet testing, User Acceptance testing, Performance testing
Implement	Project Review

Fig. 5. Quality assurance

C. Quality Control

Due to the characteristics of the IT-based project, testing is the most important approach to assure the product quality, just as is shown on the table in QA part. The figure below describes testing tasks in the platform development life cycle Fig.6.

The quality management of the final product defines the consequence of the whole project, and also the process should not be separated from risk management. Risk management concentrates on the defects and weakness of a project, while quality management focus more on improvement and change. However, their objective is the same, to protect the project from failure. The Sciebo project did risk management and quality management at the same time, made a combination between risk and improvement, which is quite essential for success.

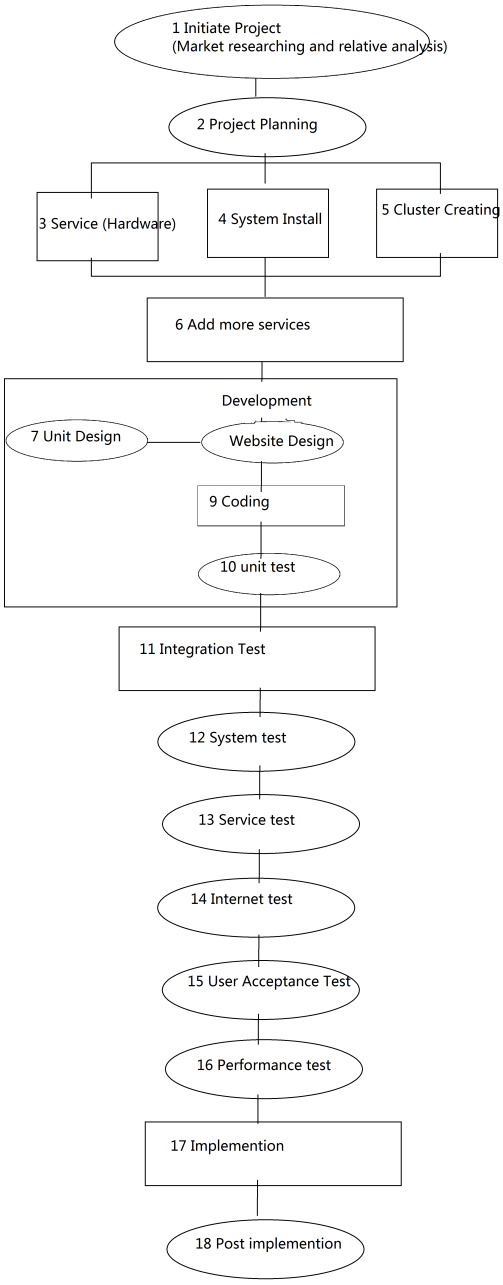

Fig. 6. Testing Tasks in the SDLC

VII. Conclusion

A. Success factors

As the prerequisite factor of a project-level success, scope management is of vital importance. Sciebo is no exception. First of all, as the guideline tracing down the whole implementation of the project, objectives defined in this project satisfied the need of a successful project. Concerning the SMART criteria:

- Specific: the objective of this project is quite specific, build a cloud storage service for university staff, students.
- Measurable: Since there is clear definition of requirements from both survey conducted and research done, the scale of requirements is obvious, no matter in target users, required data volume, functions and user experiences.
- Agreed: Approved by both potential users and consortium. This is quite important since that the project is not an impulse of the consortium but a real need from potential users.
- Realistic: Sciebo is no more than a cloud storage service. There are strong service providers and open source community regarding this area (IBM and OwnCloud in this project).
- Time-bound: milestones and deliverable are clearly defined.

As an IT project, Sciebo perfectly fits into SMART criteria in its objective definition part. In addition to the successful objective definition, clear definition of requirements collected from survey and refinement also plays an important role in the success of this project. The requirements are split into two parts: 1. same functions as commercial cloud storage services; and 2. secure data within universities. Based on this clear definition, the scope management could easily trace during the whole project implementation. Minor changes have been done during the whole project process.

B. Possible improvements

Though the running project turns out to be a success, there could be several improvements in scope management part.

- At the initiating part of this project, user-oriented method plays the key role, which means fewer cost problem is considered. This may a tradeoff that education project may benefit more than its cost. But once this project failed, this would lead to a great loss.
- Resource estimation and constraints seemed not to be considered. Although the latter part evaluates this aspect, decision making is a little doubtful without certain consideration on this part.

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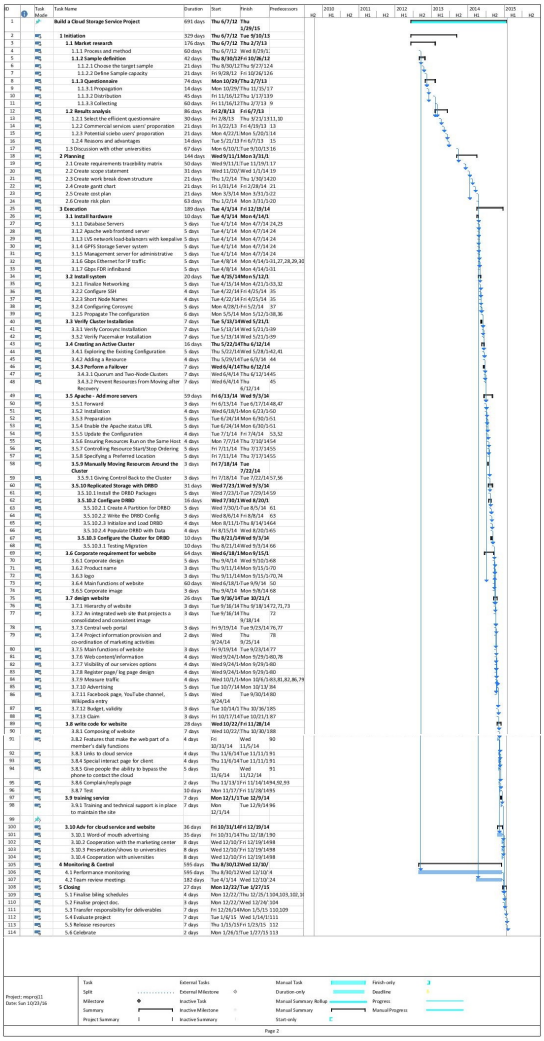
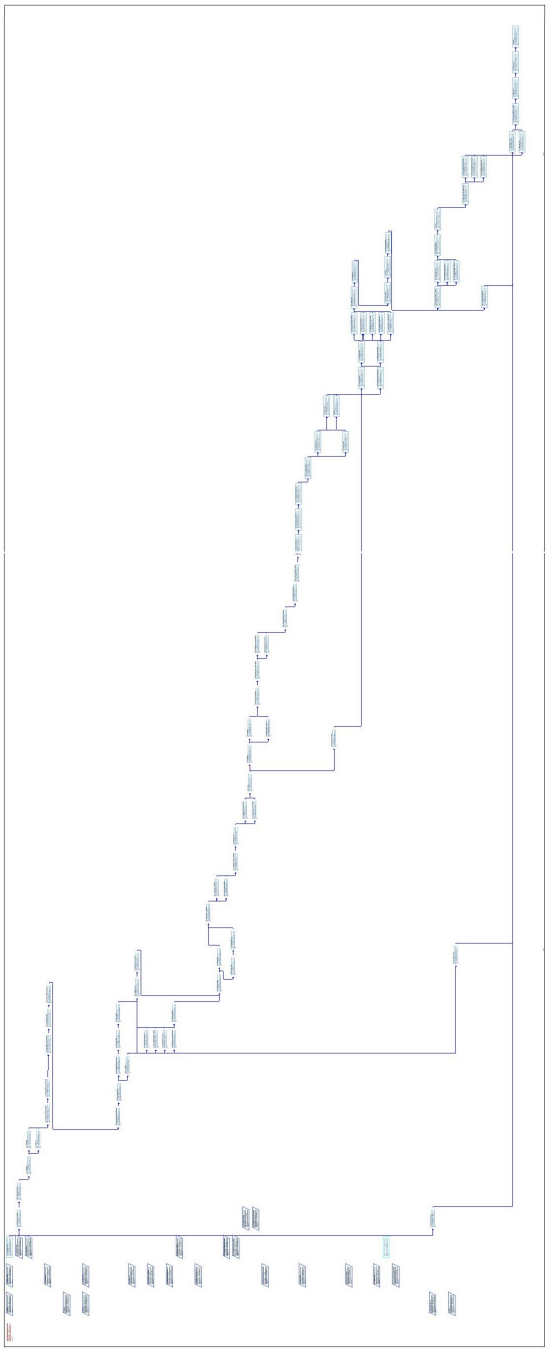
VIII. Appendix

A. WBS



B. AON



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