



INDUSTRIAL ENGINEERING DEPARTMENT BLG448E
PROJECT MANAGEMENT IN ENGINEERING
FALL 2017 TERM PROJECT

Analysis of Project:
Rewriting modules of sahibinden.com Android
Mobile Application

sahibinden.com

From third quarter of 2017 to third quarter of 2018

Project continued by four senior engineers, Director of Engineering and Vice President of Engineering at sahibinden.com Headquarters for implementing new technologies into sahibinden.com android application.

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This report has been prepared according to meeting between Yunus Güngör and Berkay Aktan at 24.11.2017 14:30 in sahibinden.com headquarters.

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Project management framework

a. Initiation

Project description: This project is designed to rewrite 23 modules of sahibinden.com android application. Rewritten modules must implement up to date, new technologies and must be compatible with new platforms. Also written modules must implement more understandable, more documented, and more independent from the individual application code structure. Project's success will be determined on amount of user traffic it attracts to the app, will be determined with being able to switch between different newcomer engineers quickly (understandability and readability of application code) and will be determined with responding much quicker to incoming requests from other departments to engineering department.

Statement of Work

Scope:

- Rewriting 23 modules for sahibinden.com android application
- Integration of new modules with old ones of sahibinden.com android application
- Testing and measuring success of different modules to find best module
- Implementing a structured and easy to understand environment for future projects and future engineers

STAKEHOLDER REGISTER

NAME	ROLE	POWER	SUPPORT	FUNCTION
sahibinden.com	Product Owner	H	M	Financial Owner of the Product
	Director of Engineering	M	H	Management of project development
	Director of Product	M	H	Helps to determine production priority for modules
4 Senior Engineers	Project Team	M	H	Project members that develop the project
	Clients and Salesmen	H	H	Companies and individuals that are using Sahibinden.com android application therefore project's outcome product
	CEO	H	L	May or may not send direct requests about the project and approves resources
	Vice President of Engineering	H	L	May or may not send direct requests about the project and approves resources

b. Planning

1. Scheduling

Due to privacy reasons this report will not examine exact schedule. This report will be focusing of general structure of schedule. Main aspects examined here is that how this schedule was created and which methods was used in the progress.

This project has been managed using agile management techniques. Agile software development techniques do not use exact schedules with high precision. Rather than creating strict and binding schedules, agile techniques encourage flexible schedules to keep up with extreme flexibility of software industry. Most of the schedule created by senior engineers (people who work on the project up close) on the go and examined by team leaders and directors. However, there is a low precision, rough schedule for completing the project.

This rough project schedule, created by utilizing informal communications between team leader, senior engineers and director. Most of the schedule predicted according to experience. Experience on this context does not mean individual's experience but the whole team's experience. Total experience utilized by consulting the most experienced person on the subject in group for each subject. If there is nobody with enough experience or knowledge on a subject director estimates the schedule, but this situation nearly occurs. Also, all this process managed by director and rough schedule carried to upper management with informal methods. Using this method keeps effort required low, and utilizes most of the project team by consulting appropriate team members. However, using informal methods may cause information loss in the future, and prevents keeping statistical and historical data for future use cases such as estimation processes, training newcomers and so on.

In this project 23 different modules for android application of sahibinden.com expected to be completed in 4 quarters which is approximately one year. Considering learning curve of senior engineers, number of completed modules is expected to rise exponentially by each quarter. This project has been started at the third quarter of 2017, which is approximately July of 2017. In the first quarter 2 modules has been rewritten but in the next quarter this number expected to increase greatly. This incrementation and starting slowly and gaining acceleration later approximation is constructed according to learning curve of software engineers.

After creating roughly schedule, schedule gets detailed on each quarter. When detailing schedule, past experiences including previous quarter has been considered. Just like estimating a rough schedule, this schedule also estimated with team members and director. Also, other requests and project metrics has been utilized in this process to define order of importance. Order of importance defined by Director of Product, Director of Engineering and Android Product Owner rather than whole team. However, work packages defined with whole team. Defying order of importance with middle management has some benefits. Order of importance is very important in the aspect of gaining market share for company. Therefore, this order must be determined by upper or middle management. Using upper management for this task may increase their workloads. Also, this order must be determined with cooperation from clients of sahibinden.com which includes real estate agents, other sellers, and buyers. This type of cooperation conducted under product department. Therefore, middle management from product department must be included. Therefore, importance defined by Director of Product, Director of Engineering and Android Product Owner. Besides that, upper management can always request a change in order of importance by informal methods. And if upper management has insight or other type of information, order of importance changes with an informal request.

After creating order of importance, work needs to be done splits into work packages of one week. This process also done with the whole team under the supervision of Director of Engineering. After work packages determined KANBAN technique used for developing software. KANBAN is a table of work packages which has four sections. Those sections are “backlog” which is where all unprocessed work packages kept, “in progress” which is where work packages that some of engineers started doing kept, “testing” which is where completed work packages wait for testing and “done” which is where work packages that completed and passed all tests kept. In Kanban, any senior engineer can just pick a work package and start working. There is no need for assigning any of the work packages to anybody. This method keeps engineers very motivated and eliminates work package assignment progress. If there is a work package that nobody starts, it is assigned by director to somebody. Also, all this process supervised by director.

In conclusion scheduling mostly done by project team, and is designed as flexible as possible with rough descriptions. Details added on the go, and details determined according to the market, the team, the company and sometimes requests from other departments and CEO.

2. Cost Estimate and budget

Cost estimation is done using a metric called man/week. This metric represents how much work is done by one software engineer and how much payed to that engineer, in a week. For example, 2 man/week can either, two engineers working one week or one engineer working two weeks. Using this metric cost estimation is very easy and accurate. Each module’s rough schedule already gives cost estimation. For this project expected cost and assigned budget is 208 man/week. And since this is an ongoing project 48 man/week of the budget has already been spent.

3. Risk Management

Risk management has two aspects for a software project. First aspect is implementing software and second aspect is how user effected. In this project every finished module is tested with a small percentage of users to determine if users liked it or did not like it. According to obtained data different type of module implemented again, old module used instead of new one or implemented module kept as is. This ensures maximum user satisfaction and ensures lowest risk possible in matter of user experience.

In matter of implementing software, director manages risks. Director pushes engineers for decreasing number of bugs added to the system. Bug is a software error that causes unwanted behavior. And sometimes these bugs can be caused by software engineer in a new module or can be inside one of the modules that outsourced. In the case of bugs in a new module written by software engineer, bugs detected by examining system and gets solved. This type of bugs usually calculated in scheduling and does not affect project a lot. However, if there is bug in one of the outsourced modules, this module is changed with another module with same functionality or bug in outsourced module is fixed. To be able fix a bug in outsourced module, outsourced module’s source code must be available. Another option to use error recovery systems. In this option another module implemented that fixes errors caused by a bug. But this approach may add even more bugs to the system. Decision between those options have been made by director according to the importance of module and bug’s effective size.

c. Execution

When the planning of a project has been done, execution part of the project begins. In execution part of a project, project manager tries to stick with the plan. However, that might not be the case all the time. sahibinden.com is rewriting the old modules of new architecture mobile application. There are different stages of execution for this project. They have an organizational hierarchy, execution style, and reporting system.

- Product Owner
- Director of Engineering
- Vice President of Product
- Product Development Director

(figure-1)

First, I would like to talk about organizational structure about the project. Organizational structure has a crucial impact on a project. Grouping the people, who will work on the project, and ensure that the groups are doing their job when the project is going on is important. Project stakeholders are in figure-1 for sahibinden.com project structure.

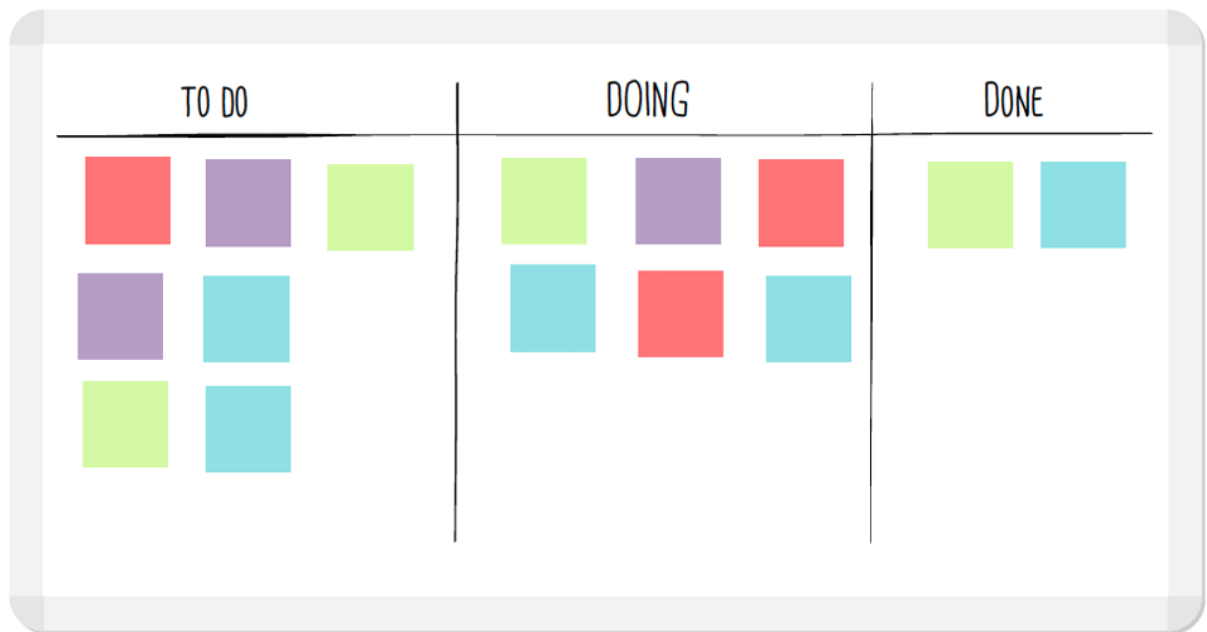
People on figure-1 are responsible for project progress. The project goes on with harmony of the engineering department, marketing department and human resources department. In the engineering department of sahibinden.com, hierarchy is like figure-2 while project is executing

Vice President of Engineering
Directors(3)
Managers(3)
Team Leader
Senior Engineer

(figure-2)

Vice President of engineering is on the top of the pyramid. There are three directors, three managers, one team leader and multiple senior engineers working under vice president of engineering. Everybody in this hierarchy, reports to somebody, that is structurally higher than himself or herself. A person, that we have talked on sahibinden.com, implied that structure of project execution is important and huge effect on the project. Moreover, he also claimed that they had good outcomes from the structure, that they have been using for recent years.

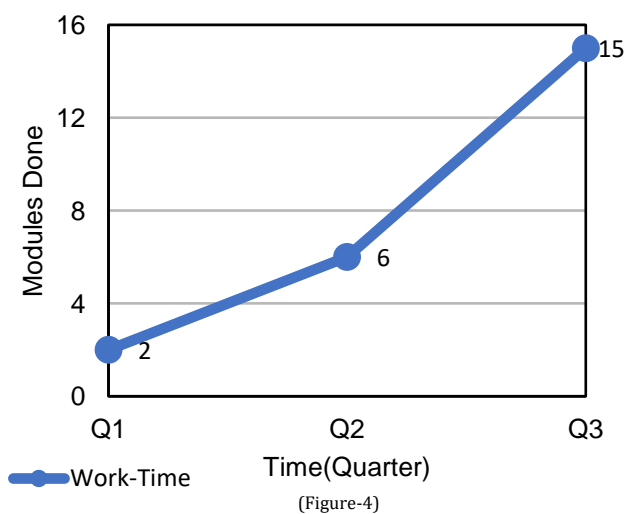
The second part of the administration of the project is execution style. sahibinden.com uses kanban technique for managing the project. Kanban is a technique for managing the work process. It commonly used in software development projects. Since sahibinden.com is developing new functional mobile apps, kanban system fits very well on their situation. Simply illustration on figure-3 shows us how kanban style work management systems performance. While using this technique, managers might assign some work on TODO part of the structure to somebody. In addition to, somebody from developer team can assign the duty to himself or herself. A person in sahibinden.com stated that they like the second one better. Sponsors for the project is in the level of



(Figure-3)

director. Moreover, they don't have line manager. They group up for communicating about the project. They plan what should they do quarter by quarter. They choose what to do by analyzing the competitors, customer wishes, and field feedback. While the project is going on, engineers create multiple modules with same functionality but with different code for the app. Company select random amount of people for beta testing. This has a disadvantage. Since there are multiple same modules, company use their resources redundantly. At some period, they have checkpoints. Proof of concept of the project operates like a gate. They are using work breakdown structure for the project. It is a deliverable-oriented breakdown of a project into lesser components. A person in sahibinden.com claimed that they have done two modules and they have twenty-three more to go. Furthermore, he also claimed that they want to finish this project in quarter three of 2018. This calculated very roughly. Figure-4 shows the number of modules will be completed by time. They have started slow. However, they have a impressive curvature for learning. They want to be able to run this project without stopping the other projects. They have prolonged the project when they realized that they can never finish the project on time. Most importantly, person on sahibinden.com claimed that they have never had more than %10 of sagging.

The third and most important stage of the execution of the project is reporting structure.



(Figure-4)

Reporting has a significant impact on the ongoing project. Moreover, reported projects may become indicative role for the next works. sahibinden.com does more informal reporting than formal reporting. This means that they do more reporting with words than papers. Doing oral reporting has several disadvantages. When the company hires new engineers, new ones cannot adapt to the company as fast as it can be at the company with noted down reports.

To sum up, project managers are not always connected to plan while running the project. They should use a technique for managing the project and hard copied report as much as possible. And more importantly, they should always be prepared for effect that may occur from outside.

d. Monitoring and Control

Sahibinden.com android software team develops the project in a module by module bases rather than all in one. That provides the team to change any module quickly. And module sizes changes from very big parts to tiny ones. For example, different colors on user interface or a structure change for search box. Module size is determined by calculating how drastically changed interaction between user and the app. When a project module is finished and ready to use Sahibinden.com android software team does not wait for the whole project to finish. So, team pushes the newly finished module to the live version, but new module does not nullify the old one rather two module work side by side. But only ten percent of the users see the new module rest keeps using old one. This method is used with every module deployment if it is applicable.

Then each module monitored based on some metrics that are settled before the project. Some of those metrics are:

- Traffic changes
 - o If traffic that is directed to the module increases that is counted as a success by development team.
- Average time spent on app by common user
 - o Need to be examined module by module rather that whole app – if a search module makes peoples searches more efficient and quicker that is a win rather than a lose –
- Bug number
 - o Each project aims for lower bug number from projects before – might not achieved if more people worked on the current project than before -
- User count
 - o If user number increased after deployment of a big module department counts this a success.

Before public beta test team conducts an alpha test of its software by testing it with people that is not a part of the engineering team. After that with the feedback that beta testers gave team makes some changes in the module and release it to beta testing with various levels of rarity for common user. Beta testers usually does not take more than ten percent of the total users depending on the module size.

Controlling the project and the source code of the project is done via versioning software like git. After monitoring the modules software team decides with the director whether to pull or fully implement the said module. If said module decided to be pulled and failure that module is not used any time later to save time and resources.

e. Closeout

After coding of the modules is done and every part is tested by alpha and beta testers and if new module is well received our team deploys the said module to live version and fully deploy the new project into common user. After the deployment of the new version of the software our team watches and evaluates the metrics that mentioned in the monitoring and control. Success evaluation

is done using said metrics, user feedback and management satisfaction. We learn from our customers satisfaction, state of our project, time delays, cost overrun and our metrics. If one or more things are out of balance or not where we wanted it to be we take a look at the problem, try to understand and improve on it for the next project.

Key Issues and Problems

During each project we come across with some problems and key issues, to prevent any other problem on future projects we detect them. Therefore, some of the key issues and problems and listed:

- Using informal methods to upper management might cause information loss in the future, and it would also prevent keeping statistical and historical data for upcoming use cases such as estimation processes, training and adaptation of newcomers
- Fixing a bug in outsourced module might be done with various options one of them is changing the outsourced module with another module that has same functionality. This might result to overrun of resources since another module that has same functionality must be designed and implemented. Another option is to fix the bug in outsourced module. But in this option outsourced module's code must be accessible and available. There is one more option which is to use error recovery systems. But this option has its own handicap which is probability of having bugs in implemented error handling modules.
- Selecting random amount of people for beta testing is a key issue. This might cause using resources redundantly. And also, it might affect the motivation of the staff assigned on the project badly since they might have to implement the related part more than once.
- Too much flexibility in completion time of modules which cause to project to overrun time.