

# Introduce Lessons Learn Approach as A Phase in SDLC

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## ABSTRACT

To understand what Lessons Learned is we must have to understand what is Lessons? Lessons can be derived from any activity. They are a product of operations, exercises, training, experiments, and day-to-day staff work. During the course of our activities most of us will recognize ways of doing things more easily or efficiently that can be passed on to our colleagues and successors to help them avoid problems and do even better than we did before.

The term Lessons Learned is broadly used to describe act of learning from experience to achieve improvements. It is an activity used by people to gain benefit in current activity from past activity experience. The idea of lessons learned in an organization is that through a formal approach to learning, individual and the organization can reduce the risk of repeating mistakes and it would increase the chance of success. This means lessons learned approach will reduce failure risk, and improve operational effectiveness and also increase cost efficiency.

## General Terms

SDLC models, SDLC Phases, Structure of SDLC model, Lessons learned

## Keywords

SDLC Phase, Lessons\_learn incorporated model, Lessons learned team, benefits of lessons learned approach

## 1. INTRODUCTION

Lessons learned is not just learning from experience but used to justify changes that will lead to improved performance. So, Lessons learn can be defined as follows:

“The purpose of a Lessons Learned approach is to learn efficiently from experience and to provide validated explanation for revising the existing way of doing things, to improve performance, both during the course of an operation and for next operation.”

In project development organization, Lessons learned approach must be considered as phase. It is very important process which is mainly consist of taking information from past projects and putting it to use in upcoming projects or next iteration of the same project. This is done by extracting the relevant information and storing it for future use and analysis.

The main goal of the lessons learned process is to provide information that will enhance the efficiency of future projects in term of cost, labour, time. The information gathered during

the project is held, in bits and pieces, in the hands of the project's team members. These people, as individuals, cannot transform the information they have during course of project development into well format, so that anyone can use it. In many cases, in software development organization, the team members leave the organization upon the completion of the project, leading to the possible loss of critical information when the project is complete.

Of course it is not like that that team members would leave the organization only after completion of the project. They can also leave the organization in between of the project also. Some of the organizations document the positive and negative issues at the end of the project or we can say prepare lessons learned document at the end of the project. If lessons learned documents are prepared at the end of the project development than there must be loss of information of positive and negative issues raised during project development due to leaving of organization by any team member of the project. So, lessons learned process should be continuous process throughout the project development. This is the first reason why lessons learned approach is emerged with SDLC.

Here is another reason to include it with SDLC, continuous throughout the project life cycle is that if any issue rose during the project development at any phase; can team member remember it till the end of the project development? This is the big question. Organization will be in loss of information of such issues if team member forget as the issues are not fresh. They become old. Team members even don't remembers which kind of remedial action had been taken to solve the issue. So, for not losing the information, lessons learned process should be continuous process throughout the project development cycle.

“Lessons learned document should be one of the deliverable of the each phase of the project development life cycle.” To make this happen, organization should have a lessons learned team, working as project team in co-operation with project development team.

This requires lessons should be meaningful and proper format so that appropriate authority can use it. It must give clear understating of the issues related to the system development phased during project development phases.

Lessons learned should be used as a phase as it would be proved as very important phase of the software development life cycle. Here, researcher has tried to incorporate lessons learned approach with the software development life cycle in

both ways as a continuous process and as a phase at the end of the SDLC.

Successfully implement this lessons learned approach, active participation of lessons learned team, project management team, project development and technical team and administrative people should be there throughout the project development. Personnel must be encouraged to share new lessons from their prior or ongoing project and also apply already given or published lesson to their areas of responsibility.

There are three basic steps of lessons learning with respect to Software Development Life Cycle Process:

**1) Identification:** Collect learning from each phase of the SDLC Process. During each phase identify each experience which can be helpful for next iteration of this running process or it can be the different project. The experience can be good or bad. The good experience can lead the project team that they are doing right or on a proper track of development life cycle. And from the bad experience the team can be aware of taking the wrong path of development.

**2) Action:** To take action to change existing way of doing things based on the learning. Form good experience the project team member can go along with the path for success. But from bad experience the project team member can learn to

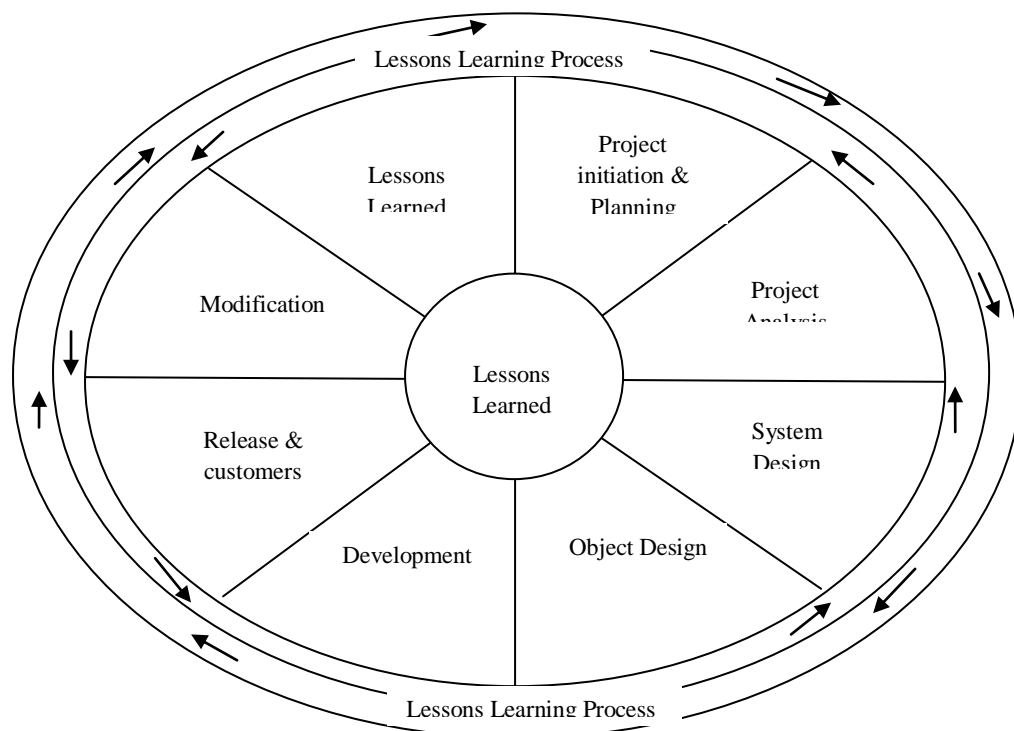
change their path to get success. It means whatever action taken in previous iteration or previous project, which was not satisfactory for that stage could be changed. So, from that bad experience, team member can learn to change the existing way of doing the things which could lead to the success.

Previous project or previous iteration's documents are reviewed by the project team. They can learn to implement action differently rather than the previous one if any action had lead the project development procedure inefficient to some extent.

**3) Institutionalization:** Communicate the change so that relevant parts of the organization can benefit from the learning. It is the most important step of the lessons learned approach. It is most important to aware the people about the changes applied to the conventional or previously done task. People of the organization must aware about changes so they can also get benefited from the action taken.

To do so, this new actions can be introduced to another people of the institute training can be arranged. Or new staff can get informed by the old or senior staff through the means of mails, newsletter, etc.

Figure-I Lessons learned incorporated SDLC model



## Why Lesson's Learned Important

Each team members under the project thinks that they know better. They think like they have a better schedule or better budgeting, more communication, and spent time on

requirements, etc. All these things are about how to do the work, not what to work on. Taking about how things get done or working on how thing get does not or get anything done. This is one of the reasons why team members hate planning

and planning is doing nothing and we all like doing something.

Doing action is root cause of the problem. The idea behind this is that we all think that action is better than thought or discussion or planning. But before doing anything there must have to plan out about the task; there are multiple ways to complete the same task. Form which, the best way should be chosen. To find out which way to choose or which approach is best to complete the task lessons learned is used.

Everything learned from previous projects, whether they were successes or failures can teach important lessons. All the team members can learn important lessons. If lessons were genuinely learned from past projects then the same mistakes would not be repeated on different projects or next iteration of the same project. Projects within an organisation would then be more consistently delivered on time, within budget and to the customer's complete satisfaction. When project environment are challenging with multi-functional team and they can be culturally and geographically diverse from each other. Budgets are usually tightly constrained and business requirements frequently change during development time. Project owner may not have effective communication to the development team and there can be different department which are not well integrated-with the result the similar mistakes are often repeated.

In such scenario, it would advisable not to repeat mistake again and again to save money and time of project owner and stakeholder of the project. The technological infrastructure is readily available to assist the transfer of knowledge across team and department involved in a project. So, in such environment lessons should be learnt from previous project.

We consider a case study through which we can understand why lessons learned approach is necessary.

It is a practise of software Development Company that any project is under construction has a weekly meeting about that project. The meeting is based on the status of the project going on. Management quickly review the status of the project, go over any big issues and review and approve changes if it is needed.

As the project goes on in development stage, these meeting also continue in weekly manner. It is a practise to held weekly meeting in every project. But at later stage of software development it is not required. It should go to once in a month. The main reasons seem to be that there are too many people in the meeting, the topics are repetitive, the board gets weekly status reports, and that the meeting is boring / waste of time.

Now suppose these meetings will take 1/2 hour when there is no issue. While monthly meeting with the management will

last for 45 minutes or may be one hour. So, by calculating average of time, personnel can get extra time to give their performance. Employee would save almost about 50% of their time. As the development goes on meeting time should decreased from 45 minutes to 30 or less than 30 minutes. This time can be utilized by the team members in a constructive manner which would be beneficial to the organization.

So, this is the scenario where lessons learned approach is useful. Project manager should learn from the lessons learned and understand how to utilize the personnel time for the development of the project. By changing in the conventional approach, he can do something beneficial to the organization.

These lessons learned are useful. The time spent in doing the work better is time well spent. Getting it right the first time is cheaper and easier than doing it now and fixing it later.[1] It means whatever is the changes in activity it should be implemented for betterment of the project.

So, if lessons learned from the past projects are indeed useful and can prevent problems later down the line; organisations should create a lessons learned culture where people not only take the trouble to learn from past projects, but actually to learn something useful from past project. Many project teams conduct a "lessons learned" review at the end of the project. It is useful but only for short duration or small project. As the project completes they can put their good or bad experience in document form at the end of the project. Here with small project small no of personnel are involved with the project. So, it would be easy for them to document their experience at the end of the project life cycle.

What about large project or the project which last for one to two years? With such projects the no of personnel involved are also large. There are large no of team members to accomplish different task of the same project. Some of the personnel left the project in the mid of the project and new personnel would join them. In such scenario it would be impossible to document their experience. Another thing about large project is that after experiencing any good or bad experience in the starting or at the mid of the project development team member would forget about it at the time lessons learned at the end of project development.

So, in such scenario, it would be beneficial for the organization, to document all the good and bad experience at the end of each phase of the development. The value lies in paving the way for future projects, so they will experience fewer headaches and setbacks. There is no need to wait until the entire project finishes. Issues could be captured incrementally throughout the project, or very soon after it's over, while the issues are still fresh.

## Benefits of Lesson's Learned

- 1) Management will get the complete scenario of what went well and what didn't go well during the project development life cycle.
- 2) Stakeholders or team members can learn lessons from past experiences recorded in the lessons learned of the same type of project or from previous iteration of the same project.
- 3) For any problems that went largely unresolved, for instance, consider preventative measures that could help people work through or avoid the problems in the future.
- 4) It might involve tools to speed up the work, checklists to make sure people don't skip important steps, and solutions for thorny problems. Like if you found components that were supposed to work together but didn't, and someone found a solution or a workaround, record that information to help people prevent to solve similar dilemmas in the future.
- 5) You can use your repository <sup>[1]</sup> of lessons learned to help your customer service or technical support personnel solve problems in a just-in-time fashion, for example. If your staff or colleagues need to address complex issues on the fly, or troubleshoot technical issues quickly over the telephone, they would need fast access to solutions for similar situations that were addressed in the past.
- 6) By capturing issues incrementally during project development, you will achieve far greater long-term success than by ignoring or forgetting problems, or by simply moving on when a project or phase ends.
- 7) Organization will get benefit in monetary aspects as some issues solve before arises.
- 8) It will also help team members in saving their time by guiding them what to do and what to not do. So, resource will be utilized in proper and right manner.

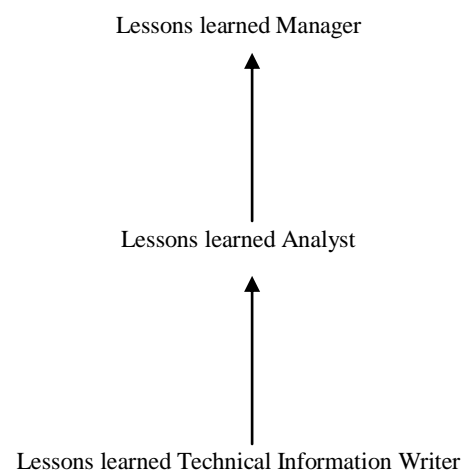
So, above are the benefits to have lessons learned approach throughout the whole life cycle of the project.

## Structure of Lessons Learned Team:

Lessons learned team should be there in all the organization for developing project. All though lessons learned approach should be adapted by all the organization who is involve in

manufacturing, imparting services, or any business. How to deal with the lessons learned should be managed by this team. It means lessons learned team should be the ultimately responsible for lessons learned approach. Identify issue/observation; get information about issue or observation, how to deal with them, how to store and where to store them, how to make lessons learned easily available to required personnel all must be decided by lessons learned team.

So, there are lots of responsibilities of lessons learned approach. To manage these responsibilities there must be personnel appointed to do particular task. The hierarchy is defined below:



**Figure –II Hierarchy for Lessons learned Team**

Organization must have Lessons learned manager, lessons learned analyst, lessons learned technical information writer. Depending upon the company and depending upon the size of the project no of personnel can be varying.

## Roles and Responsibilities:

### Lessons learned Manager (1):

Lessons learned manager plays important role in Lessons learned team. Generally, lessons learned manager's position is single. He/she is the leader of the lessons learned team.

Lessons learned manager works with the whole lessons learned team as well as with the project manager. If any issues arise during project development, project manager want solution from lessons learned manager if he/she has. Lessons learned manager should remain present during any meeting arranged during project development process.

<sup>1</sup> Here repository means Lessons learned database

Lessons learned manager gives solution of the issue/observation captured and also help them to choose best approach to sustain success for their project.

Lessons learned manager works with team members to discuss the matter regarding how to find factor affecting the issue? How to analyse any issue? To store the issue that could be available to any team member when they needed. Overall issues should be handled at lessons learned team, is under the guidance or leadership of lessons learned manager.

Lessons learned manager should decide the strategy for the matter like how to store lessons identified information? How to store lessons learned information? How it could be made accessible to all? How to share lessons learned information?

Lessons learned manager is answerable to Regional head of the organization. If organization is distributed across many geographical areas, then there should be lessons learned team at the every regional office.

### **Lessons Learned Analyst (1):**

Lessons learned analyst is playing important role in lessons learned team. The no of position for lessons learned analyst should generally one. Depending upon the size of project no of position could be varying.

Main task allotted to lessons learned is of analysis. When any issue arises or observation is captured, lessons learned analyst should analyse the issue. He uses so many techniques to analyse the issue and find out the factors affecting the issues to arise. He/she must analyse any observation very deeply.

Lessons learned analyst is working under lessons learned manager. He/she has to report lessons learned manager. Moreover, lessons learned analyst has to handle technical information writer as they are working under him/her. Lessons learned analyst used to collect information from observer or team members who face the problem or identify the problem.

He/she should also involve with the deciding the format for lessons learned document. The strategy to find the factors is decided by the lessons learned analyst. He/she should give the best solutions for any issue with the help of lessons learned manager. Though ultimately lessons learned manager should identify the best solution to sustain project success.

### **Lessons learned technical Information Writer (2):**

No of positions for the Lessons learned technical information should at least 2 positions. It could be vary depends upon size of the project.

Lessons learned technical information writer has to sum up all the information when lessons learned analyst is gathering information from the observer who capture the observation or issue or from the team member who faced the issue. All the information regarding any issue is listed or collated by lessons learned technical information writer. They have to arrange information regarding any issue in a proper format. This information is handed over to the lessons learned analyst.

Lessons learned technical information writer has to look after the matter like how to store lessons identified information? How to store lessons learned information? How it could be made accessible to all? How to share lessons learned information? All these things are handled by technical information writer.

Lessons learned technical information writer has to attend all the meeting held during the course of the project development process. They have to list out the issue raised during the meeting and prepare document for the same.

### **Parameters of Lessons Learned Team**

Lessons learned team would be very important organ of any organization. As the parameters of the lessons learned team is clearly depicted over here.

- 1) Accept the lessons learned team as part of project development process.
- 2) Lessons learned team should be given all the facilities which is providing to all the project development team members.
- 3) Lessons learned team should get an environment where team members can work freely and sincerely.
- 4) Lessons learned team should work in coordination with the other project team members.
- 5) Lessons learned team should provide latest technology to store and distribute the lessons learned.
- 6) Lessons learned team should not play blame game. That, they should not blame any personnel involved in project development for any issue raised.
- 7) Lessons learned team could get participation of any of the project development team to analyse the identified issue or observation.
- 8) Lessons learned team has to attend the meeting held during the course of the project development.

- 9) Any of the project development team members who asked to cooperate in lessons learned should support the lessons learned process.
- 10) No one should take anything personal if lessons learned team member asked them for any issue raised.
- 11) They should be aware of the all the information regarding project development.
- 8) Lessons learned team should store all the documents at central repository with latest technology.
- 9) Lesson learned team should make the provision to get the information of lessons learned with ease.
- 10) Lessons learned team is responsible to dissemination of information through e-mail, blog, forum, etc.

Above parameters should be set to get work done. To get benefit of lessons learned approach above parameters should be followed. So that, lessons learned team can work properly and sincerely to obtain correct output. This output can be utilized for any of the successor project development.

With this parameters lessons learned team can work smoothly and with ease. So, this is necessary to set such parameter for the lessons learned team.

### Functionality of the Lessons Learned Team

The type of work or functionality of lessons learned team should supposed to do is describe over here.

- 1) Lessons learned team should keep track of all the issues/observations raise during project development process whether the observation is of success or failure.
- 2) Lessons learned team should help other project team member in their need to solve any issue by finding out prior lessons learned document.
- 3) All the team members have to remain present to keep track of project development process.
- 4) Project team members can get help from lessons learned team at any stage of development.
- 5) Lessons learned team should work in such a way that project development process would be easy and seamless.
- 6) Lessons learned team should prepare templates for recording the lessons identified.
- 7) Lessons learned team should prepare template for recording the lessons learned.
- 1) Lessons learned team help project development team in any hurdles, need or emergency.
- 2) By helping project development team lessons learned team would make development task stress free.
- 3) Project development task is very stressful and project development team remains in tension throughout the project development process. As lessons learned team makes this task stress free, project development team feel relax.
- 4) As project development team members feel relax, the efficiency of working of development team will go high.
- 5) In stress free environment development team would give better performance.
- 6) Better performance of the development team would lead to the success of the project.
- 7) Ultimately, it would lead to the success of the organization.
- 8) Learning from prior mistake would give benefit to the organization in terms of time saving. As from prior mistake or success development team can choose the best way of success.
- 9) It would also give benefit to the organization in terms of cost saving by avoiding the wrong way to be chosen.
- 10) It would be the best management tool as basis on prior lessons learned; better management plan would be formulated.

### Advantages of Lessons Learned Team

Following are the advantages which could be achieved by having the lessons learned team in an organization.

So, above given benefits would be achieved by having lessons learned team in any project development organization.

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