

Investigacion Operativa

Alejandro Nadal

March 22, 2020

1 What is operation research?

There are certain problems in life that can be solved through operation research. Generaly, we try to improve certain quantifiable aspect through a decision.

These problems have a high combinatorial solution.

2 Lean, applied to SW Ing

First reference: Tom and Mary Poppendieck, they created the term Lean Software Development. The SW Agile manifesto is important as well:

2.1 Values

1. Individuals and relations above processes and tools
2. Working SW over excessive documentation
3. Colaboration with the client over contractual negotiations
4. Answers to change over following a plan

2.2 Principles

1. Our biggest priority is to satisfy the client through early and continous delivery of valued software
2. We accept the change of requisites, even in late stages of development. Agile processes take advantage of change to give competitive advantage to the client

3. We deliver functional sw frequently, in periods of two weeks to two months, aiming for shortest time span possible
4. Project owners and developers work together during all the project.
5. Projects are developed around motivated individuals. They must have the environment and support that they need, and they must be trusted with the work execution.
6. The most efficient method to communicate information to the development team and between its members is face to face talk
7. Functioning SW is the main measure of success
8. Agile processes promote sustainable development. The promoters, developers and users must be capable of keeping a constant rhythm for undefined periods of time
9. Continuous attention to technical excellence and good design, is what improves Agility.
10. Best architectures, requisites and designs come from self organized teams
11. The team reflects on how to be more effective in regular intervals, in order to adjust and perfect its behaviour.

2.3 Lean Software Development Principles

1. Delete waste, everything that does not have value for the client
2. Amplify learning
3. Take decisions as late as possible, when we have more info
4. Deliver as fast as possible
5. Delegate responsibility on the team.
6. Build with integrity.
7. Global vision: try to avoid local improvements, instead, go for a global approach.

2.4 Google ten principles

1. Focus on the **user** and everything else will come
2. It is better to specialize in something and do it really well
3. Speed is a safe value
4. Democracy in web works: people help to choose what is better because of their own choices
5. You do not need to be in your office to get your answer. That is for users, you are supposed to be access to your technology everywhere
6. You can get income acting ethically
7. Information never ends, you can keep improving
8. The necessity of information overcomes every possible frontier.
9. You can be a professional without a suit: Work can be fun and it can empower you. You must trust your own employees.
10. Do not conform just with excellent results. Predict future necessities from users.

3 People and Workgroups

Poppendieck says the success of Lean depends on human behaviour. Four tools are necessary: Self-determination, motivation, leadership, and experience. People's work must have purpose. Management becomes a facilitator, they must detect the needs of the team. The team must be united, be a group that trusts and competes with each other in a good way. Leaders must be trusted, respected. The leader must show how stuff is done, lead the way. The team is supposed to get experience on its own.

Issues Individualism, Breaking teams to frequently (every project people are rotated, for example), and programmers belonging to many teams.

3.1 How to incentive people

In short, do not try to do that just with money. It does not last. There are two kinds of organizations, and only one works with lean.

- They just try to get money, individuals put effort and they are paid.
- Try to stay in bussiness and give jobs and impact in industry. These employers give attention and effort and the organization tries to develop the individual to his/her maximum potential. The compromise goes both way. That is the way to incentive a person.

4 Continous Improvement

Again, esentially, continous improvement of teams and people is necessary. Kaizen events are used to solve problems. These are a tool that gathers, in a team to the representatives of the different involved departments, for it to be solved. It does not last longer than a week and it is intensive work.