Prototyping Methodology

Steps on How to Use It Correctly

Prototyping has been widely used for decades.

"A prototype is an early sample, model, or release of a product built to test a concept or process or to act as a thing to be replicated or learned from."

If you have an idea you need to evaluate, you may have asked yourself:

Is prototyping the way to go and why use it?

the easy answer is, to gather feedback.

The goal of a prototype is to evaluate an idea.

David Walker, Ph.D.; Executor Director of the Learning Technologies at McMaster University, states subsequent models are created by refining earlier versions, with the aim of convergence on the desired end product.

This design methodology is sometimes known as evolutionary design or incremental development. Different versions of prototyping are used in software design, system development, and electronics engineering."

Let's think in terms of software development. You can have a "dispose of" solution that was designed to test user functionality.

What better way to determine if the concept is in conjunction with your business expectations. And only then can you make the refinements needed to develop your final product/solution.

Prototyping, Waterfall and Spiral Models

A protoype is a sample implementation of the system. It provides limited and main functional capabilities of the proposed system. (moves in a circle) Build on earlier versions.

- Determine Objectives
- Develop
- Refine
- Demonstrate
- Test
- Implement

The waterfall model is the traditional lifecycle model in which the lifecycle phases are executed in a sequential manner: (those similar to a waterfall)

The difference with the waterfall model is the fact that each phase is completed fully before you start the next. It is harder to change something that was not discovered in your concept stage.

- Requirement analysis
- Design
- Development
- Testing
- Deployment
- Maintenance
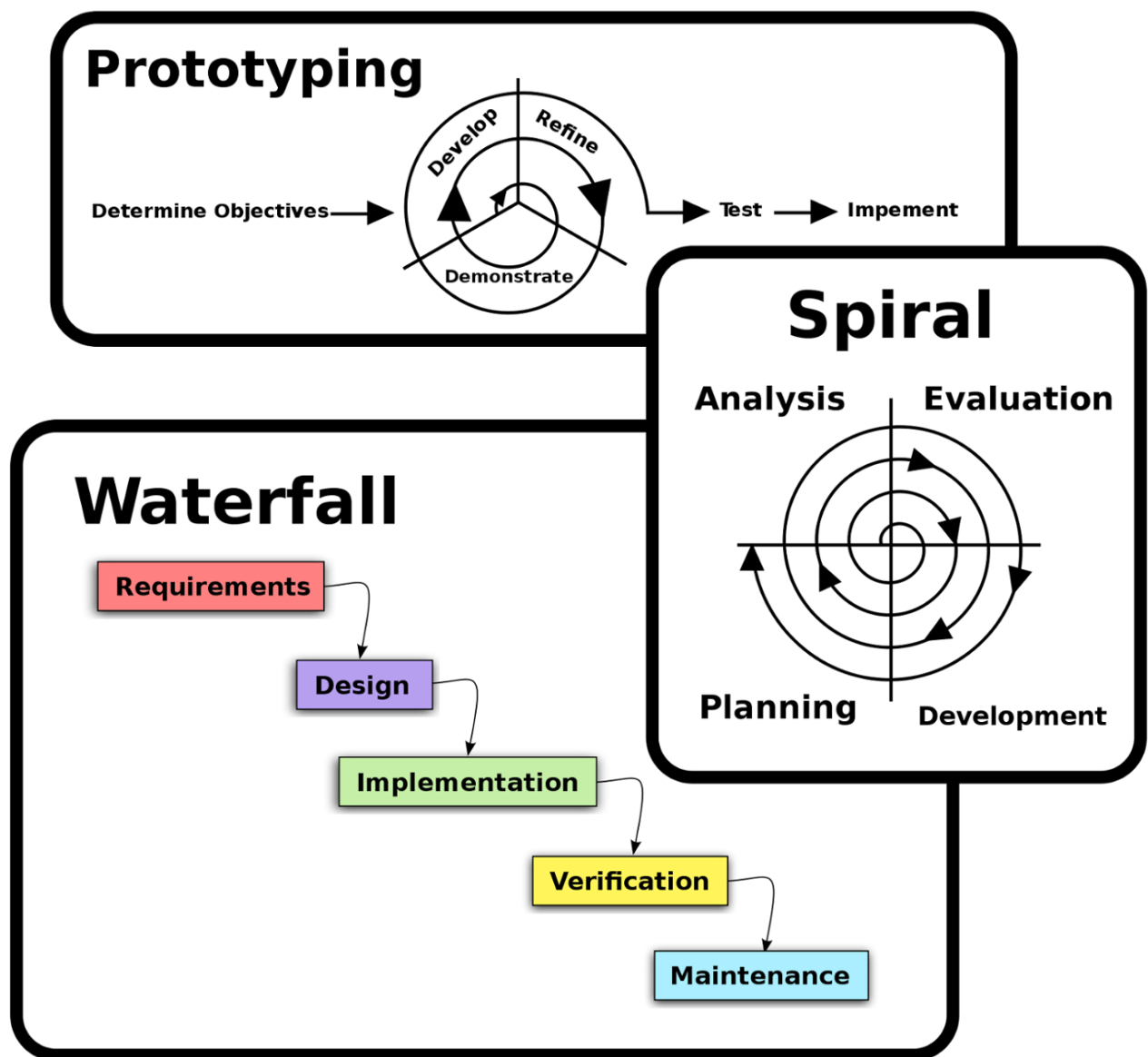
Spiral model is a risk-driven process model generator for software projects. Based on the unique risk patterns of a given project, the spiral model guides a team to adopt elements of one or more process models, such as incremental, waterfall, or evolutionary prototyping.

According to ISTQB, the basic idea in Prototype model is that

"Instead of freezing the requirements before a design or coding can proceed, a throwaway prototype is built to understand the requirements.

Prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determine the requirements."

Idea to Product Through Prototyping

How to Go From Idea to Prototype in One Day

1. Keep it simple
2. Don't strive for perfection
3. Know your options

5 Steps for Turning Your Invention Ideas Into a Product

1. Document it
2. Research it
3. Make a Prototype
4. File a Patent
5. Market Your Invention

There are different schools of thought on prototyping versus the waterfall method. The latter does not build on earlier versions. New ideas pop up constantly during development stages.

Prototyping; the hard work is in the beginning with re-working older versions. You've heard the quote before, "If at First You Don't Succeed, Try Try Again".

There are steps you can take to transition through the different phases. Depending on your product or solution this can vary.

But here goes...

1
Define your main goal of the project. Start your initial brain-storming with your team. You may know your design obstacles and need to research solutions.

2
Stick with 1 or 2 features to begin with. Remember this version will be refined along the way.

3
Create your design on paper.

4
Discuss with appropriate partners or stakeholders knowing there will be improvements. Any managers, users, researchers etc. should be included for feedback.

5

Edit your design after discussion with partners or stakeholders.

6

Design from paper to computer. There are kits, books and information to help you create prototypes.

7

Consult with appropriate entities and make approved revisions.

8

If the outcome is what you agree on, add another feature.

9

Documentation will be continuous. There is always room for improvement.

The goal through the process is to realize your end-game and work together.

Now that we reviewed actual steps to reach your goal, let's take a look at the latest trends in prototyping.

Latest Trends in Prototyping

MVP (Minimum Viable Product)

Proposed by Eric Ries, the Lean Startup Methodology is a practice for "developing products and businesses based on validated learning, getting customer feedback quickly and often."

Here are his thoughts on maximizing chance of success vs. minimum viable product:

Building the Minimum Viable Product

Eric Ries suggests adapting the rules of creating the MVP product. Rather than getting the product "right"; or employing the "release early, release often" philosophy.

His words, "take what you think it is and cut it in half. And do that 2 more times! Early adopters can be forgiving, they have the vision."

Scrum - Solve Big Problems, Test New Ideas

Originally created with the thought of a better way of building software, it is a framework for completing intricate projects.

The Scrum framework keeps things simple. It implements the scientific method of empiricism, a theory that states "knowledge comes only or primarily from sensory experience."

The image below represents Scrum in Action as described by Ken Schwaber and Jeff Sutherland (from planning through software delivery in this case).
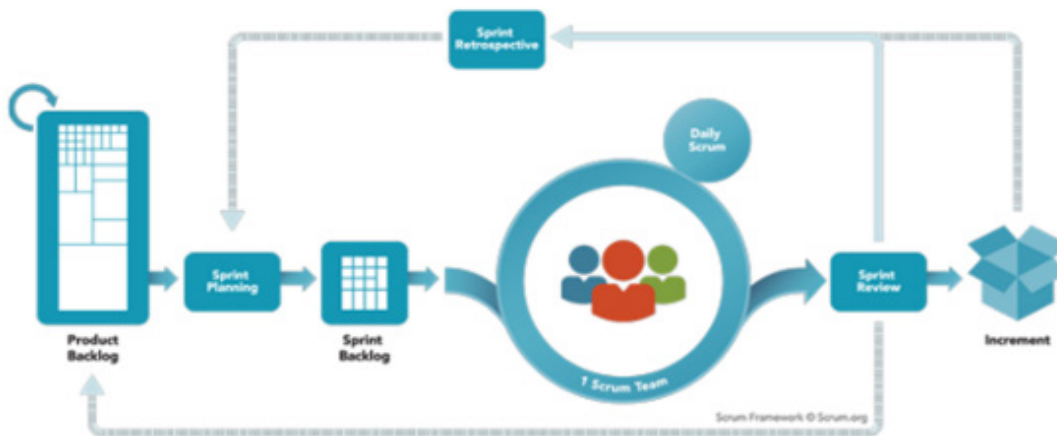
In addition as part of Scrum, the Scrum Values include:

- Courage - work on tough problems
- Focus - focus on the work of the sprint and goals of the team
- Commitment - personally commit to achieving the goal
- Respect - scrum team members respect each other and value opinions
- Openness - agree to be open about the work and challenges.
- Faced with a complex project?

Use Scrum to improve teamwork, communications, and speed.

The framework consists of a wish list called product backlog.

This moves to sprint planning. In this phase, your team pulls a small chunk from the top of the wish list, a sprint backlog and decides how to implement those pieces.

An amount of time to finish the work is decided upon. (2-4 weeks). At that point your work should be potentially shippable.

After the quick sprint is complete, a review is required. The cycle repeats itself at this point. You and your team check items in your product backlog and begin again.

There are pros and cons of any prototyping.

Advantages of Prototyping Methodology

It's first important to understand prototype models are best utilized when the desired system needs to have a lot of interaction with end users.

When using this type of model, errors typically can be detected much sooner and quicker user [feedback is available leading to better solutions](#).

"Since in this methodology a working model of the system is provided, the users gain a better understanding of the system being developed."

Disadvantages of Prototyping Methodology

This method may increase the complexity. Your plans may start to extend beyond your original plans.

In addition, "The focus on a limited prototype can distract developers from properly analyzing the complete project." But that is why there is the refinement stage.

Conclusion

The prototyping methodology allows you to design a working "prototype" or early sample of what's to come.

It begins with analysis and requirements, followed by a quick design to give feedback on an "idea" of a system or product. The feedback enhances the build of the initial prototype.

Once evaluation of the prototype is complete, refinement can take place. This will assist in reducing associated risks.

If you are in need of innovative lighting solutions that adapt to your idea, you can start prototyping today.

Talk to an Expert