The Art of Project Management:

How to figure out what to do.

«The Art of Project Management» By Scott Berkun

How to figure out what to do

«The hardest single part of building a software system is deciding what to build. No other part of the conceptual work is as difficult in establishing the detailed technical requirements, including the interfaces to people, to machines, and to other software systems. No other part of the work so cripples the result if done wrong. No other part is more difficult to rectify later. Therefore, the most important function that the software builder performs for the client is the iterative extraction and refinement of the product requirements.»

Fred Brooks

If you don't know what you need to do, it's too early to figure out how to do it

Requirement	Design/Specification	Implementation
What do we need to do?	How will we do it?	Do it.
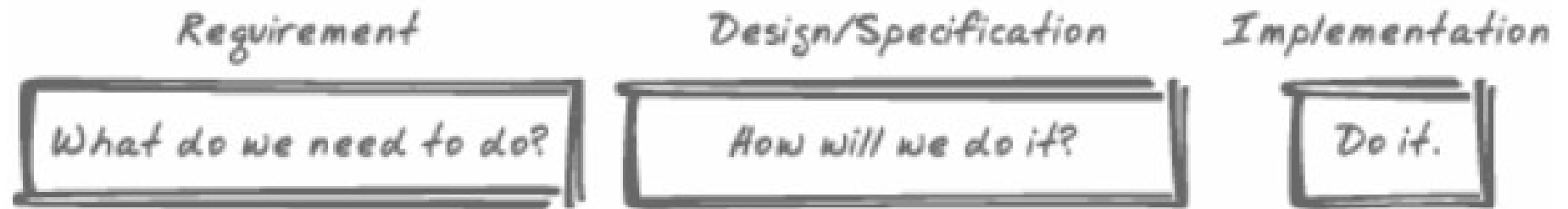
Different types of projects

- **Solo-superman.** In the simplest project, only one person is involved, he does everything himself and is his own source of funding.

- **Small contract team.** A firm of 5 or 10 programmers and 1 manager is hired by a client to build a web site or software application. They draft a contract that defines their commitments to each other.

- **Big staff team.** A 100-person team employed by a corporation begins work on a new version of something. It might be a product sold to the public or something used internally.

Different types of projects

- **Who has requirements authority?** Someone has to define the requirements and get them approved by the necessary parties (client or Vice President). There may be different people with high-level requirements authority («it will be a sports truck») and low-level requirements authority («it will get 20 mpg and have 4-wheel drive»)

- **Who has desing authority?** Similar to requirements, someone has to define the design of work itself. The design is different from the requirements because there are always many different possible designs to fulfill a set of requirements.

Different types of projects

- **Who has technical authority?** Technical authority is defined by who gets to choose which engineering approaches are used, including programming languages, development tools, and technical architecture.

- **Who has budged authority?** The ability to add or remove resources to a project can be independent from other kinds of authority. In the contract team situation, the team might have the power to define the requirements and design, but they might need to return to the client each time they want more money or time.

Different types of projects

- **How often will requirements and desings be reviewed, and how will adjustments be decided?** The answer depends heavily on previous questions. The more parties involved — the more effort will need to be spent keeping them in sync. The less authority you have, the more diligent you need to be about reviewing and confirming decisions.

Planning deliverables

- **Marketing requirements document (MRB).** This is businesss or marketing team's analysis of the world. The goal is to explain what business opportunities exist and how a project can exploit those opportunities.

- **Vision/scope document.** A vision document defines the goals of a project, why they make sence, and what the high-level features, requirements, or dates for a project will be.

- **Specifications.** These capture what the end result of the work should be for one part of the project. Specifications define «how» of a project from a design and engineering perspective.

Planning deliverables

- **Work breakdown structure (WBS).** While specification details the work to be done, a WBS defines how a team of engineers will go about doing it. What work will be done first? Who will do it? How can we track them? WBS can be spreadsheet or very complex (charts and tools).

The three perspectives. Business

Each of the deliverables mentioned earlier represents one of two perspectives on the project: **business** or **engineering**.

The business view focuses on things that impact the profit and loss (P&L):

- What unmet needs or desires do our customers have?

- What features or services might we provide that will meet those desires and needs?

- On what bases will customers purchase this product or service? What will motivate them to do so?

- What will it cost (people/resources)? Over what time period?

The three perspectives. Business

- What potential for revenue (or reduced organizational operating costs) does it have? Over what time period?

- What won't we build so that we can build this?

- Will it contribute to our long-term business strategy or protect other revenue-generating assets?

- How will this help us match, outflank, or beat competitors?

- What are the market time windows that we should target for this project?

  Marketing: product, price, placement, promotion.

The three perspectives. Technology

Technology perspective is not the customer's perspective

- What does it (the project) need to do?

- How will it work? How will each of the components in it work?

- How reliable, efficient, extensible, and performant are the current systems or ones we are capable of building?

- What engineering processes and approaches are appropriate for this team and this project?

- What applicable knowledge and expertise do our people have?

- How will we fill gaps in expertise? (Train/hire/ignore/hope on magic)

The three perspectives. Customer's

What the customers do, how they do it?

- What do people actually do? (Not what we think they do or what they say they do)

- What problems do they have trying to do these things? Stuck, confuse?

- What do they need or want to do but aren't able to do at all?

- Where are the specific opportunities to make things easier, safer, faster, or more reliable?

- What design ideas for how to improve?

- How can those ideas be explored?

- What core ideas and concepts should the project use?

The magical interdisciplinary view
Power balance
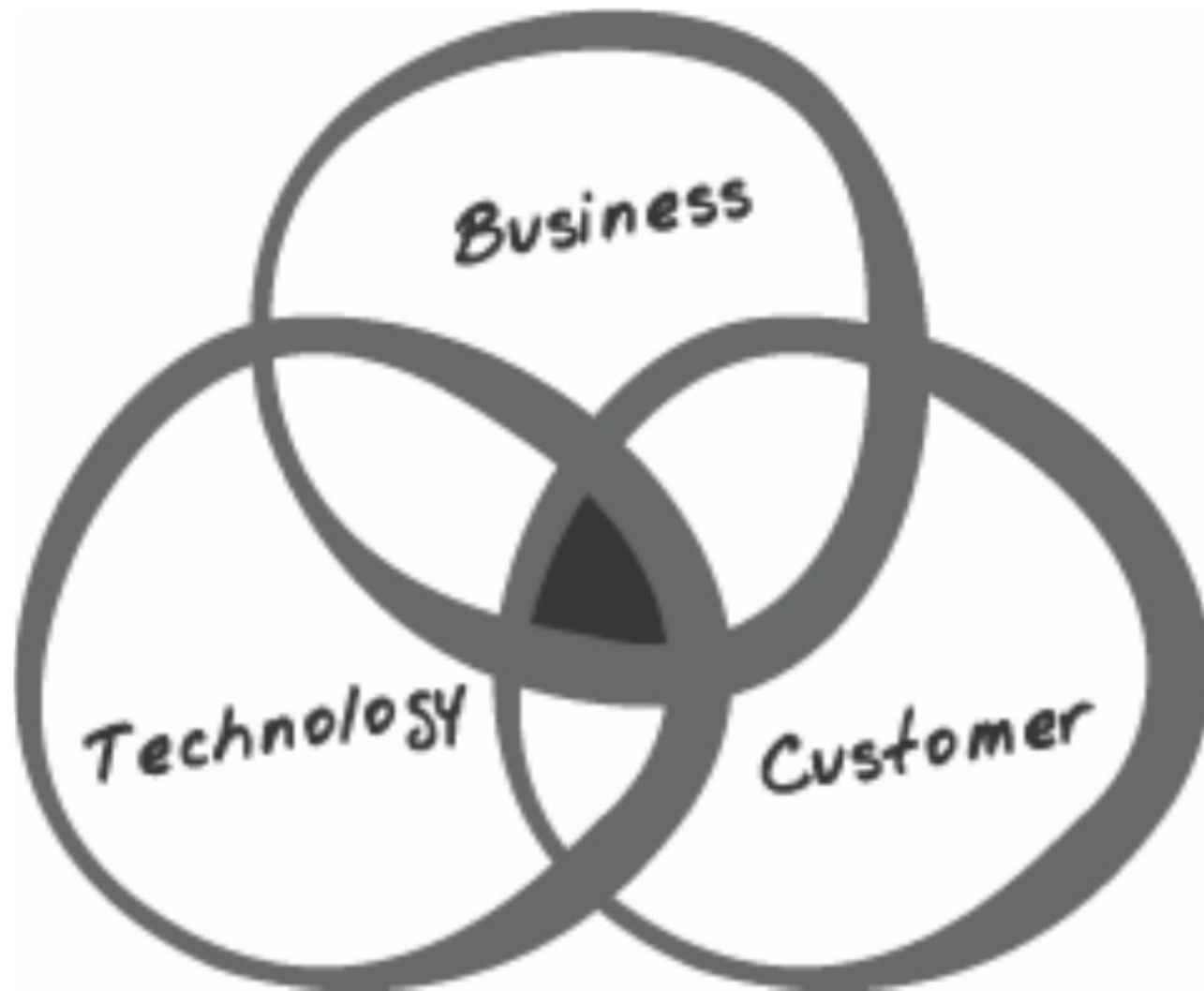
The three perspectives

«Years ago, I was involved in one of these silly wars myself. I was the program manager fo r web-search features on Internet Explorer 4.0. Two business development people were assigned to us, and they were negotiating deals with the major search engines of the time (Excite, Yahoo!, Lycos, AltaVista, etc.). We argued with these business experts over design decisions, continually debating over what was best for the customer versis what was best for the business. We each believed that we held the authority (I spoke the design/engineering staff, and they provided the business arguments). We argued on the same points for weeks, always debating the specific decisions and never stepping back to evaluate our hidden philosophies on what made for good products...

The three perspectives

.. Things got so bad that we brought in our group manager to help us reach a compromise.

I'm convinced a broader view of the world would have helped everyone involved. We were all so invested in our egos and beliefs that we were willing to spend tons of time fighting over tiny points, instead of working to understand all of the perspectives on what we were building. A better vision document could have helped, but that was impossible because the business challenges of the Internet were so new to the industry (1997). However, had we been sharing each other's knowledge, instead of resisting it, we might have a shot at finding a mutually benefical compromise.

When you're looking for the best solutions, they won't always correspond to what you're good at doing, or which ideas you personally prefer.»

Right questions

The simplest way to frame planning work is to define a set of questions that the planning work needs to answer.

- What are the 3 or 4 customer grouping we can use to discuss different kinds of customers? How do their needs and behaviors differ?

- What demographic information can help us? (Age, income, profession, education, etc.)

- Which activities is each user group using our product for? How does this correspond to what they purchased the product for?

- Who are our potential new customers, and what features, scenarios, or types of products would we need to provide?

Right questions

- Do we have the technology and expertise to create something that satisfies these needs and problems? (For each identified need, answers of yes, maybe, and no)

- Can we build technology and obtain the expertise to create something thaat satisfies these needs and problems?

- Are there viable business models for using our expertise and technology to solve these identified problems or needs?

- What are the market timelines for the next release or product launch?

- What are competitors in this marketplace doing?

Bad ways to decide what to do

Bad way	Example	Why it happens	The problem
We will do what we did last time.	"Version 3.0 will be like 2.0, only better!"	Often there isn't the desire or resources to go back and do new research into the business, technology, and customer issues.	The world may have changed since v2.0. Without examining how well 2.0 did against its goals, the plan may be a disaster.
We'll do what we forgot to finish last time.	"The feature cuts for Version 2.0 will be the heart of 3.0!"	Items that were cut are arguably well understood and partially complete, making for easy places to start.	Remaindered features are nonessential. Focusing a release on them may not be the best use of resources.
We'll do what our competitor is doing.	"Our goal is to match Product X feature for feature."	It's the simplest marketing strategy. It satisfies the paranoid, insecure, and lazy. No analysis is required.	There may be stupid reasons a competitor is doing something.
We will build whatever is hot and trendy.	"Version 5.0 will be Java based, mobile-device ready, and RSS 4.0 compliant."	Trends are trends because they are easy and fun to follow. People get excited about the trend, and it can lend easy excitement for boring or ill-defined projects.	Revolutions are rare. Technological progress is overestimated in the short term, underestimated in the long term. Customer problems should trump trendy fads.
If we build it they will come.	"Project X will be the best search engine/web editor/widget/mousetrap ever."	By distracting everyone to the building, rather than the reason for building, people can sometimes avoid real planning.	Does the world need a better mousetrap? People come if what is built is useful to them, not because a team decided to build something.

Common customer research methods

Method	What is it?	Pros	Cons
Focus group	A group of potential customers are brought together to view prototypes and give opinions in a facilitated discussion.	Can get many opinions at once. Allows for extended suggestions and open dialog.	Discussions are difficult to analyze and easy to misinterpret. Poorly trained facilitators create deceptive data.[a]
Survey	A series of questions are given to potential customers.	Low-cost way to get information from large numbers of people. Good for very broad trends.	Information reliability is low.[b] Authoring surveys without biasing answers is difficult. Easy to misinterpret data.
Site visits	Experts or team members go to the customers' work sites and observe them doing their work.	Observe the true customer experience. Often this is the most memorable and powerful experience for the team.	The data is most valuable to those who did the visit: it's hard to transfer to others or to use quantitatively.
Usability study	Selected customers use a design in a controlled environment. Measurements are taken for how many scenarios they can complete, in how much time, and with how many errors.	Quantifies how easy it is to use anything. Provides evidence for specific problems. Most valuable when done early, before project begins.	Little direct value for business or technological questions. Can be wasted effort if done late or if engineering team doesn't watch often.
Market research	The market of the product is examined to see how many customers there are, what the competing products cost, and what the revenue projections are.	Only way to capture the business view of a market or industry.	Doesn't explain why products are successful, and it focuses on trends and spending, rather than people and their behaviors.

[a] Focus groups tend to bias people toward being helpful. They don't want to insult their hosts, and they will often be more positive and generous in considering ideas than they would otherwise.

Bringing all together

As an example, here's what a list of problem statements for an intranet web site might look like:

- It is hard to find commonly needed items on the home page.

- Pages with department information are very slow to load and users have to wait.

- The database query page crashes when working with large tables, and users have to start over with their work.

- The site does not provide automated access to HR services, which are time consuming to do manually.

- Search results are difficult to scan with the current layout.

- The registration page doesn't warn about required fields, and it's too easy to make mistakes.

- The status page doesn't include information about email, and users cannot find out why their email isn't working.

- There is no way to save preferences or options for how the home page is displayed.

Bringing all together

Possible features of Project X:

- Commonly used items will be easy to locate on the home page.

- Search results will be easy for most users to read quickly.

- The site will provide easy, automated access to HR services.

- The registration page will make it easy to enter information without mistakes.

- Department information pages will be at least as fast as the home page itself.

- The database query interface will be as reliable as other parts of the system.

- Users will be able to learn about email server status issues in a simple and convenient way.

- Users will have a convenient way for the system to remember their preferences.

Summary

- Different projects demand different approaches to planning.

- How planning is done is often determined by who has what authority. Requirements, design, and budget are the three kinds of project authority that impact planning.

- There are some common deliverables for planning projects: marketing requirements documents (MRDs), vision/scope documents, specifications, and work breakdown structures (WBSs).

- The most powerful way to plan a project involves use of three equal perspectives: business, technology, and customer. The customer perspective is often the most misunderstood and misused.

- Asking questions forces good thinking and directs planning energy effectively.

- The process of defining requirements is difficult, but there are good references for how to do it well.

- Problem statements and scenarios are a simple way to define and communicate requirements. They are easily converted into design ideas without losing clarity about what's important and what isn't.