Manajemen Proyek Perangkat Lunak

Arna Fariza

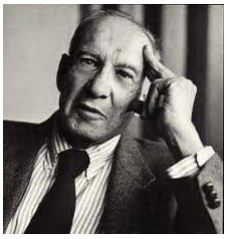
Topic

- Management
- The Four P's
- Project Management
- Managing Constraint
- Communication
- Building the Project team
- Menyusun Jadwal
- Menyusun Budget
- Membuat Progress report proyek

Management

- Management -> manage: mengemudikan, mengurus, dan memerintah.
- Management -> managiere: melakukan, melaksanakan, mengurus sesuatu.
- Management-> the art of knowing exactly what you want to do, and then seeing that they do it in the best and cheapest way (Fridreck Taylor)

Management & Leadership



Peter F. Drucker
(Nov 19, 1909 – Nov 11, 2005)

Management is doing things right; leadership is doing the right things.
~ Peter F. Drucker

The Power of Management

"Kebenaran yang tidak terorganisir dengan rapi dapat dikalahkan dengan kejahatan yang terorganisir dengan rapi."

~ 'Ali bin Abi Thalib r.a.

The Four P's

The Four P's

- The manager who forgets that software engineering work is an intensely human endeavor will never have success in project management.
- The manager who fails to encourage comprehensive stakeholder communication early in the evolution of a product risks building an elegant solution for the wrong problem.
- The manager who pays little attention to the process runs the risk of inserting competent technical methods and tools into a vacuum.
- The manager who embarks without a solid project plan jeopardizes the success of the project.

The People

- Key practice areas for software people:
  - staffing,
  - communication and coordination,
  - work environment,
  - performance management,
  - training,
  - compensation,
  - competency analysis and development,
  - career development,
  - workgroup development,
  - team/culture development,
  - and others.

The Product

- Before a project can be planned:
  - product objectives and scope should be established,
  - alternative solutions should be considered,
  - technical and management constraints should be identified.
- Without this information, it is impossible to:
  - define reasonable (and accurate) estimates of the cost,
  - an effective assessment of risk,
  - a realistic breakdown of project tasks, or
  - a manageable project schedule that provides a meaningful indication of progress.

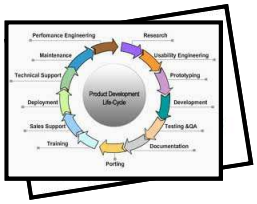
The Product

- As a software developer, you and other stakeholders must meet to define product objectives and scope.
- In many cases, this activity begins as part of the system engineering or business process engineering and continues as the first step in software requirements engineering.
- Objectives identify the overall goals for the product (from the stakeholders' points of view) without considering how these goals will be achieved.

The Product

- Scope identifies the primary data, functions, and behaviors that characterize the product, and more important, attempts to bound these characteristics in a quantitative manner.
- Once the product objectives and scope are understood, alternative solutions are considered.
- Although very little detail is discussed, the alternatives enable managers and practitioners to select a “best” approach, given the constraints imposed by delivery deadlines, budgetary restrictions, personnel availability, technical interfaces, and myriad other factors.

The Process



- A software process provides the framework from which a comprehensive plan for software development can be established.
- A small number of framework activities are applicable to all software projects, regardless of their size or complexity.
- A number of different task sets—tasks, milestones, work products, and quality assurance points—enable the framework activities to be adapted to the characteristics of the software project and the requirements of the project team.

The Project

- We conduct planned and controlled software projects for one primary reason—is the only known way to manage complexity.
- To avoid project failure, a software project manager and the software engineers who build the product must
  - avoid a set of common warning signs,
  - understand the critical success factors that lead to good project management, and
  - develop a commonsense approach for planning, monitoring, and controlling the project.

Project Management

Table 1-1 The Nine Project Management Knowledge Areas

Knowledge Area	*What It Does*
Project Scope Management	Controlling the planning, execution, and content of the project is essential. You need to pay special attention to both project and product scope so that the software you end up with is what you intended to make in the first place.
Project Time Management	Managing everything that affects the project's schedule is crucial. Who wants tax software that comes out on April 16?
Project Cost Management	Projects cost money, and this knowledge area centers on cost estimating, budgeting, and control.

Project Management

Table 1-1 The Nine Project Management Knowledge Areas

Knowledge Area	*What It Does*
Project Quality Management	No project is a good project if the deliverable stinks. Quality doesn't happen by accident, so this knowledge area works to ensure that the product you are producing is a quality product that meets customer expectations.
Project Human Resources Management	The members of the project team must get their work done. Hiring or assigning people who are competent and managing them well are at the center of this knowledge area.
Project Communications Management	Project managers spend 90 percent of their time communicating. Communications management focuses on who needs what information — and when.

Project Management

Table 1-1 *(continued)*

Knowledge Area	*What It Does*
Project Risk Management	This knowledge area is about avoiding doom. The focus is on how to anticipate risks, handle them when they arise, and take advantage of the opportunities that can help a project.
Project Procurement Management	Sometimes during the course of your software project, you may be required to work with vendors to purchase goods and/or services. You may even be the vendor that someone else is contracting for their project. This knowledge area is concerned with the processes to create vendor contracts and to purchase goods and services.
Project Integration Management	What happens in one knowledge area affects attributes of the other knowledge areas. The ninth knowledge area is fan-freakin-tastic because its purpose is to ensure the coordination of all the other knowledge areas.

Project Constraint

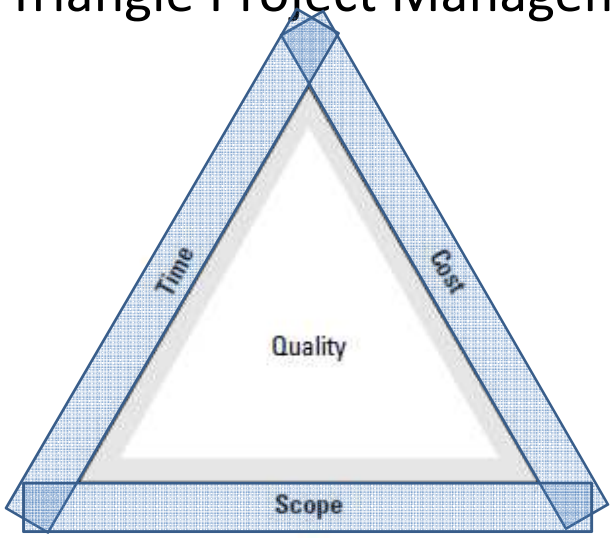
- Resource constraints such as a team member being assigned to too many concurrent projects
- Tight deadlines
- Budgetary limitations
- Government regulations
- Limitations of software
- Scope limitation, such as being required to use a particular existing interface
- Hardware requirements
- Anything else that restricts your options

Universal Constraint

- **Time:** Time constraints may range from a reasonable schedule to an impossibly short timeframe that can't budge because the product simply *must* be on shelves by September 15 (never mind that September 15 was last week).
- **Cost:** Cost constraints are the usual budgetary restrictions that you expect. ("Here's a nickel. Make it happen.")
- **Scope:** Sometimes scope is a no-brainer (you're working on the 700th rev of Acme Wizware to fix a bug). On the other hand, scope can be a bit trickier if you're dealing with an executive who isn't sure what he wants.

  We guarantee that executives will always know when a product is needed and how much money you can have to get it done. If there's a single area that the big-wigs won't have nailed down, it's scope.

Iron Triangle Project Management



Managing Time Constraint

- Time constraints are simply deadlines.
- You have a project to create a new piece of software within six months. Or there's an opportunity in the marketplace for a new application, but the window of opportunity is small, so you have no time to waste.
- Time can also be calculated as labor: Working or billable hours, processor speed, database consistency, and even network latency issues can be used to estimate time constraints.

Managing Time Constraint

- Time is time. Don't be fooled into thinking that you can buy more time.
- You can buy more labor, but that's not the same thing as adding time to project.
- Adding labor doesn't exponentially increase productivity.

Managing Cost Constraint

- Cost constraints are easy to identify because they deal with cash money.
- It's not always cash, but you get the idea; the miniscule funds in your project budget to complete the project work create a unique constraint.
- Your costs include computers and languages to code in, labor, and anything else you need to buy in order to get the job done.

Managing Cost Constraint

- Projects almost always cost somebody something. Be sure to factor in hidden costs for labor, resources, computers, pizza, celebrations, training, … And bribes! *Oh, No!*

Manage the Scope

- There are two scopes within project management:
  - *Product scope*: The product scope describes, lists, and categorizes all the features and components of the finished deliverable. This is what the customers see in their minds' eye.
  - *Project scope*: This is where you focus. The project scope is all the required work, and only the required work, to create the project deliverable. The project scope focuses on work, activities, and progress to achieve the product scope. The project scope must be protected from unapproved changes because it dictates what the project team will do and what the end result of the project will be.

Manage the Scope

- The key to manage scope is:
  - Delivering what's promised (and ONLY what's promised!)
  - Far away from *Scope creep*; unplanned changes to the project scope. Scope creep is project poison that changes the alignment of the Iron Triangle.
- There are three things in common to keep project end on time and as planned:
  - A leader who knows what he/she is doing
  - A tight changes control system
  - Team members who understand what the project is supposed to deliver and can therefore get results.

Planning for Communication

- PM spend 90% on their time for communication.
- In fact, effective communication drives just about every aspect of a project manager's activities.
- Communication skills aren't easy to cultivate. If they were, everyone would communicate brilliantly and we'd live in a world free of misunderstandings ☺

The Important of Comm. Effectively

- Effective communication occurs when a clear transfer of knowledge exists between you and at least one other person.
- You have an idea and the other person, through your conversation, gets what you're after.
  - You get an e-mail and you understand what the stakeholder wants.
  - You facilitate a project meeting and your project team follows your agenda, the information is presented, and everyone is in synch on what to do next.

The Important of Comm. Effectively

- Clear and accurate communication within your project team is vital to a project's success.
- Software project management is labor intensive.
- You must be able to communicate with the project team about many important things, including:
  - Changes in the technology
  - Nuances of the software being created
  - Demands being made by the customer

Ensuring Accurate Communication

- Document your conversations in e-mails, memos, or meeting minutes
- Sign where the line is dotted. There are many document to sign.
- Document scope, time, or cost compromises
- Take minutes. Minutes document the business of the meeting,
  - Making people accountable for what they promise.
  - Prompting team members to follow through. If the participants know that their words and promises are being documented, they're more likely to follow through.
  - Making it easier to recall what was discussed in meetings weeks, months, or even years later.

Ensuring Accurate Communication

- Set an agenda. You should create an agenda before every meeting that you're facilitating.
- Take time to proofread and edit your e-mails before sending them out to
- the world.
- If you're not much of a writer, try to keep your missives short and simple.
- Only send e-mail when you absolutely have to or if no other form of communication will work.
- Never put into an e-mail what you wouldn't say to someone's face. Performance evaluations — even compliments — should always be communicated verbally.

Communication Schedule

- Team member performance reviews
- Milestone reports
  - Monthly progress report
  - Installation report
  - Training report
  - User acceptance report
  - Monthly maintenance report
- Meetings
  - Internal progress meeting
  - Progress meeting to customer
- Cash flow forecasting

Building the Project Team

- The first step in finding all of the resources needed for your project is to determine what resources are needed in your project.
- Resources are not just people, but materials, facilities, and equipment that you need to buy, rent, or create.
- To accurately predict resources, you need to know exactly what the project scope entails. Create WBS (Work Breakdown Schedule).
  - WBS is a deliverables-oriented decomposition of the project scope.
  - It includes everything the project will create in order to complete the project scope.
  - The WBS is your scope baseline.

Terbentuknya Project Team

- Jika project internal -> ide product / library dari produksi
  - Inisiatif project dari internal (produksi)
  - Biasanya untuk product improvement atau kebutuhan aplikasi internal perusahaan.
  - Produksi lalu membentuk project team.
- Jika project dari kustomer -> kolaborasi marketing dan produksi
  - Marketing mengusahakan prospek menjadi proyek
  - Marketing dibantu produksi dalam menyusun pre-proposal, presentasi teknis, proses lelang (dalam hal penyiapan dokumen teknis dan manajemen proyek)
  - Jika terjadi kontrak / menang lelang -> kontrak diserahkan produksi untuk dikerjakan -> Produksi membentuk project team.

Stakeholder Project

- Stakeholder internal project adalah:
  - Management Produksi
  - Anggota tim produksi (programer, analyst, dll)
  - Project team (Project Manager + anggota tim)
  - Perusahaan (management, user pemakai aplikasi)
- Stakeholder project dari kustomer:
  - Management Produksi
  - Project team (Project Manager + anggota tim)
  - Vendor / Supplier
  - Kustomer (Management, User + admin)

Komposisi Project Team

- Project Manager
- System analyst
- Programmer
- Tester / QA
- Implementer
- Dokumenter
- Project Advicer (optional)

Project Manager

- Leader team
- Koordinasi dengan internal team dan eksternal (counter-part) dari user
- Menyusun skedul dan anggaran proyek
- Merekrut / melengkapi anggota tim
- Mengatur assignment kepada anggota tim
- Mengendalikan pelaksanaan proyek, yang meliputi waktu, biaya, sumber daya manusia, dan kualitas deliverable di setiap fase pelaksanaan proyek
- Menyusun laporan / presentasi progress proyek (bagian dari deliverable)

System Analyst/Designer

- Melakukan requirement definition
- Menyusun SRS (bagian dari deliverable)
- Melakukan system analysis
- Menyusun design specification (bagian dari deliverable)
- Menjadi advicer bagi programmer dalam proses konstruksi

Programmer

- Melakukan konstruksi dan perbaikan software (coding, debugging, reviewing)
- Melakukan self-testing
- Menyiapkan software deliverable (setup, konfigurasi, petunjuk instalasi, petunjuk trouble shooting, dll)

Tester / QA

- Menyusun skenario testing
- Melakukan testing software (internal) sesuai keperluan sebelum dideliver
- Menyusun dan merekomendasikan hasil testing ke PM
- Memeriksa dan memastikan kelengkapan deliverable sebelum dikirim

Implementer

- Melakukan re/instalasi software (+ database dan hardware) di kustomer
- Melakukan training aplikasi terhadap user + admin
- Melakukan trouble-shooting di kustomer
- Pendampingan (supervisi) user selama masa implementasi
- Melakukan user acceptance test
- Menyusun laporan implementasi bulanan
- Menulis error atau kesalahan lain selama masa implementasi dan maintenance, untuk diteruskan ke programmer supaya segera diperbaiki
- Menangkap peluang bisnis di kustomer

Dokumenter

- Bisa merangkap sekretaris team (jika diperlukan)
- Melakukan dokumentasi proyek (membantu menulis SRS atau design system)
- Membantu PM menyusun laporan progress proyek
- Menulis panduan user, panduan instalasi, panduan trouble-shooting
- Menyusun materi training (kolaborasi dengan programmer)

Pemilihan Anggota Tim

- PM dipilih:
  - Dari karyawan internal, sebisa mungkin karyawan tetap.
  - Memiliki kompetensi sesuai project yang akan dikerjakan, setidaknya masih berkaitan.
  - Memiliki pengalaman menjadi PM (kalau bisa).
  - Mampu berbahasa Inggris lebih diutamakan.
  - Tidak membawahi project lebih dari 2.
  - Motivasi tinggi, kemampuan komunikasi dapat diandalkan, mampu membagi assignment, mendelegasikan pekerjaan, menulis laporan, memimpin rapat, mobilitas tinggi, dsb.

Pemilihan Anggota Tim

- System analyst:
  - Dari karyawan internal, sebisa mungkin karyawan tetap. Bisa mengambil system analyst dari luar (sebagai co-analyst kontrak).
  - Memiliki kompetensi sesuai project yang akan dikerjakan, setidaknya masih berkaitan.
  - Memiliki pengalaman menjadi system analyst sebelumnya (kalau bisa).
  - Tidak sedang terlibat project lebih dari 2.
  - Motivasi tinggi, kemampuan analisa bagus, komunikasi dapat diandalkan, menulis laporan dengan jelas, mampu menjelaskan sesuatu kepada orang lain, dsb.

Pemilihan Anggota Tim

- Programmer:
  - Dari karyawan internal, sebisa mungkin karyawan tetap; terutama untuk fitur inti / utama. Sedang fitur2 lain bisa merekrut programmer kontrak sepanjang masa kontrak proyek.
  - Memiliki kompetensi programming sesuai dengan platform teknologi yang digunakan.
  - Memiliki pengalaman menjadi programmer sebelumnya (jika ada).
  - Tidak sedang terlibat project lain.
  - Motivasi tinggi, kemampuan membaca desain system, komunikasi dapat diandalkan, bisa bekerja di bawah tekanan deadline, dsb.

Pemilihan Anggota Tim

- Implementer:
  - Dari karyawan internal atau kontrak (selama kontrak project).
  - Memiliki kemampuan teknis / trouble-shoot komputer, jaringan, mampu menjalankan SQL, menguasai database dan lingkungan teknologi lainnya yang digunakan dalam implementasi.
  - Memiliki pengalaman implementer sebelumnya (jika ada).
  - Tidak sedang terlibat project lain.
  - Motivasi tinggi, kemampuan berkomunikasi dengan orang lain dapat diandalkan, bisa bekerja di bawah tekanan deadline, mobilitas tinggi, bisa bekerja dengan jadwal fleksibel, dsb.

Pemilihan Anggota Tim

- Tester / QA:
  - Dari karyawan internal atau kontrak (selama kontrak project).
  - Memiliki kemampuan teknis menjalankan aplikasi dan melakukan evaluasi.
  - Biasanya menjadi tester banyak project.
  - Motivasi tinggi, kemampuan berkomunikasi dengan orang lain dapat diandalkan, bisa bekerja di bawah tekanan deadline, bisa bekerja dengan jadwal fleksibel, mampu menulis laporan dengan baik, dsb.

Pemilihan Anggota Tim

- Dokumenter:
  - Dari karyawan internal atau kontrak (selama kontrak project).
  - Memiliki kemampuan memahami desain, aplikasi, pembicaraan dan kemudian menuliskannya.
  - Menguasai penulisan dalam bahasa Inggris atau menerjemahkan bahasa Inggris lebih diutamakan.
  - Motivasi tinggi, kemampuan berkomunikasi dengan orang lain dapat diandalkan, bisa bekerja di bawah tekanan deadline, bisa bekerja dengan jadwal fleksibel, mampu menulis dokumentasi dengan baik, menguasai EYD atau kaidah penulisan bahasa Inggris, dsb.

Menyusun Jadwal

- Menyusun WBS lebih dahulu selengkap dan sedetil mungkin (berbasis aktivitas).
  - Fitur aplikasi yang akan dibangun (fase konstruksi).
  - Deliverable yang harus dibuat dan dikirimkan.
  - Kegiatan internal proses produksi (testing, percobaan, dll)
  - Kegiatan implementasi / berkaitan dengan kustomer yang harus dilakukan.
  - Kegiatan administrasi proyek.
  - Dll.

Menyusun Jadwal

- Susun urutan kronologis (kalau bisa) berbentuk tree (untuk pendetilan).
- Susun rincian pekerjaan dalam kolom2:
  - No
  - Pekerjaan
  - Bagian (jika ada)
  - SDM yang diberikan assignment
  - Rincian jadwal (harian / mingguan)
- Tentukan jadwal masing-masing pekerjaan dengan menandai range waktunya (tergantung tools)
- Pertimbangkan:
  - Milestone proyek
  - Successor-predesesor pekerjaan (jika ada)
  - Overlap jadwal setiap anggota tim

Menyusun Jadwal

- Perlonggar jadwal (di atas kertas) sesuai dengan waktu yang tersedia -> perketat jadwal dalam prakteknya (supaya setiap pekerjaan diselesaikan lebih cepat dari jadwal)
- Jadwal dipakai untuk 2 pihak: pihak eksternal (terutama kustomer, saat laporan progress pekerjaan) dan pihak internal project team. Buat satu saja untuk memudahkan maintain jadwal.
- Berikan judul tiap jadwal dengan nama proyek dll; lalu versi / revisi jadwal tersebut.

Menyusun Budget

- Menyusun WBS lebih dahulu selengkap dan sedetil mungkin (berbasis aktivitas dan barang).
  - Fitur aplikasi yang akan dibangun (fase konstruksi).
  - Deliverable yang harus dibuat dan dikirimkan.
  - Kegiatan internal proses produksi (testing, percobaan, dll)
  - Kegiatan implementasi / berkaitan dengan kustomer yang harus dilakukan.
  - Kegiatan administrasi proyek.
  - Peralatan yang diadakan.
  - Komponen biaya non-teknis yang mungkin timbul (pajak, biaya taktis, marketing, team building, biaya modal, dll)

Menyusun Budget (Internal)

- Susun seperti susunan jadwal. Berikan judul **Pengeluaran**.
- Untuk aktivitas mungkin tidak perlu terlalu detil; cukup kegiatan besarnya saja.
- Isikan besarnya biaya masing-masing item dan KAPAN biaya itu mesti dikeluarkan -> ini berguna untuk tracking pengeluaran biaya.
- Untuk biaya orang, turunkan dari keterlibatan masing-masing orang per aktivitas proyek, lalu hitung sesuai gaji per bulannya. Jumlahkan, masukkan ke kolom di budget ini sesuai dengan kapan biaya itu dikeluarkan.

Menyusun Budget (Internal)

- Untuk biaya pengadaan peralatan, ada biaya DP sebelumnya. Pecahkan komponen biaya ini dalam dua bulan berbeda (DP dan Pelunasan). Jangan lupa, pengadaan barang perlu dihitung termasuk biaya ikutannya: biaya transportasi, pajak, telepon, dll.
- Untuk biaya kegiatan yang sifatnya di tempat kustomer, perlu dipertimbangkan:
  - Biaya transport antarkota (tiket pesawat, airport tax, taksi, porter, dll)
  - Biaya transport dalam kota (sewa mobil)
  - Biaya akomodasi dan konsumsi (sewa rumah)
  - Biaya komunikasi (HP, telepon)
  - Biaya internet, sewa komputer
  - Biaya perjalanan dinas / stay (penempatan)
  - Biaya bulanan (implementasi)
- Tambahkan pula kapan rencana penerimaan termin pekerjaan, sesuai kontrak pada baris tersendiri (beri nama **Penerimaan**).

Menyusun Budget (Internal)

- Setelah semua per bulan dikalkulasi, kita akan dapatkan selisih Penerimaan dan Pengeluaran.
- Jika ada bulan minus, pertimbangkan untuk membuat rencana pencarian dana (dan perkirakan biaya modalnya).
- Terakhir akan terjadi surplus tiap bulan; tinggal terakhir membandingkan antara jumlah total penerimaan dan pengeluaran, untuk mengetahui sisa saldo sebagai laba kotor.
- Perhitungan ini baru sebatas biaya langsung proyek, belum termasuk overhead perusahaan (biasanya beban tiap proyek ditetapkan saat RUPS, kecuali ada kebijakan tersendiri).

Menyusun Budget Proyek

- Tidak harus sama susunannya dengan Budget Internal. Yang penting:
  - Reasonable besarnya sesuai rincian pengadaan peralatan, aktivitas, dan deliverable proyek.
  - Sudah mempertimbangkan biaya produksi (HPP), yakni dari Budget Internal + Overhead.
  - Sudah mempertimbangkan Laba yang ditetapkan untuk diperoleh dari proyek.
  - Sudah mempertimbangkan biaya tak terduga lainnya (jika ada). Biaya tak terduga misalnya untuk pengadaan spare-part peralatan (dengan perkiraan).

Menyusun Budget Proyek

- Dalam adjustment harga di budget proyek (bagian dari proposal):
  - Item barang yang diketahui secara umum, dekatkan harganya dengan harga di pasar
  - Untuk item barang yang khusus, termasuk modul perangkat lunak, bisa di-adjust untuk menampung item-item biaya “tersembunyi” lainnya