

# Course: IT Project Management

LECTURE 7: PROJECT COST MANAGEMENT

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# Learning Objectives

1

Memahami konsep dan pentingnya Project Cost Management

2

Menguasai proses-proses dalam Cost Management menurut PMBOK Guide 7 & 6

3

Mampu melakukan estimasi biaya proyek TI yang akurat

4

Mengembangkan budget dan baseline biaya

5

Mengendalikan biaya proyek menggunakan Earned Value Management

6

Menerapkan prinsip value engineering dalam proyek TI

# Definisi Project Cost Management

- **PMBOK Guide 7:** "Proses untuk merencanakan, memperkirakan, mendanai, mengelola, dan mengendalikan biaya proyek" (PMI,2021)
- **Tujuan:** Menyelesaikan proyek dalam anggaran yang disetujui
- **Fokus:** Sumber daya finansial dan non-finansial

# Pentingnya Cost Management di Proyek TI



**Budget Constraints:** Keterbatasan anggaran organisasi



**ROI Calculation:** Mengukur return on investment



**Stakeholder Confidence:** Membangun kepercayaan sponsor



**Project Viability:** Menentukan kelayakan proyek (Kerzner, 2022)

# Konsep Dasar: Biaya vs Harga

**Biaya  
(Cost):** Pengeluaran  
untuk menghasilkan  
produk/jasa

**Harga (Price):** Nilai  
yang dibayar  
customer

**Profit:** Selisih  
antara harga dan  
biaya

**Contoh TI:** Biaya  
development vs  
harga jual software

# Kategori Biaya Proyek TI

**Direct Costs:** Langsung terkait proyek (gaji developer, lisensi software)

**Indirect Costs:** Biaya overhead (sewa kantor, listrik, administrasi)

**Capital Costs:** Aset tetap (hardware, server)

**Operational Costs:** Biaya operasional (maintenance, cloud hosting)



# Prinsip Dasar Cost Management

**Lifecycle Costing:** Mempertimbangkan biaya seluruh lifecycle

**Value Engineering:** Maksimalisasi nilai dengan biaya optimal

**Continuous Improvement:** Pengurangan biaya berkelanjutan

**Transparency:** Keterbukaan informasi biaya



# Metodologi dan Pendekatan

- **Traditional Approach:** Detailed estimating dan control
- **Agile Approach:** Time-boxed budgeting dengan variable scope
- **Lean Approach:** Minimizing waste dan maximizing value
- **Hybrid Approach:** Kombinasi sesuai konteks proyek



# Tantangan Cost Management di Proyek TI

- **Requirements Volatility:** Perubahan scope mempengaruhi biaya
- **Technology Changes:** Pergantian teknologi selama proyek
- **Resource Rates:** Variasi biaya tenaga ahli TI
- **Hidden Costs:** Biaya tak terduga (integration, testing)

# Stakeholder dalam Cost Management

- **Project Sponsor:** Penyedia dana dan approval budget
- **Finance Department:** Pengawasan compliance accounting
- **Project Manager:** Bertanggung jawab atas pengendalian biaya
- **Tim Teknis:** Provider input estimasi effort

# Economic Environment Factors

- **Inflation Rate:** Dampak pada biaya jangka panjang
- **Exchange Rates:** Untuk proyek dengan komponen impor
- **Market Conditions:** Supply-demand tenaga TI
- **Regulatory Changes:** Perubahan pajak dan regulasi

# Plan Cost Management - Overview

- **Definisi:** Proses mendefinisikan bagaimana biaya proyek akan diperkirakan, dikelola, dan dikendalikan
- **Output:** Cost Management Plan
- **Tujuan:** Menyediakan framework dan pedoman cost management

# Komponen Cost Management Plan



**Units of Measure:** Mata uang, satuan (jam, hari)



**Level of Precision:** Tingkat akurasi yang diharapkan



**Level of Accuracy:** Rentang acceptable variance



**Control Thresholds:** Batas variance sebelum tindakan korektif

# Organizational Procedures



**Accounting Codes:** Sistem kode akun untuk tracking



**Reporting Formats:** Format laporan biaya



**Approval Procedures:** Proses approval expenditure



**Documentation Requirements:** Requirement dokumentasi biaya



# Tools dan Techniques Planning

## **Expert**

**Judgment:** Konsultasi dengan finance department dan senior PM

## **Analytical**

**Techniques:** Cost-benefit analysis, ROI calculation

**Meetings:** Workshops dengan stakeholder kunci

# Cost Management Plan untuk Proyek Agile



**TIME-BOXED  
BUDGETING:** ALOKASI  
ANGGARAN PER  
SPRINT/RELEASE



**VARIABLE SCOPE:** FLEXIBILITY  
DALAM PENGGUNAAN  
ANGGARAN



**VALUE-BASED  
PRIORITIZATION:** ALOKASI  
DANA BERDASARKAN VALUE



**CONTINUOUS  
FORECASTING:** REGULAR  
BUDGET RE-FORECASTING

# Currency dan Exchange Rate Management

- **Multi-currency Projects:** Proyek dengan vendor internasional
- **Exchange Rate Fluctuation:** Manajemen risiko nilai tukar
- **Hedging Strategies:** Proteksi terhadap currency risk
- **Payment Terms:** Ketentuan pembayaran dalam kontrak

# Cost Categories dan Coding

- Work Breakdown Structure: Mapping biaya ke WBS
- Cost Accounts: Pengelompokan biaya untuk tracking
- Chart of Accounts: Struktur kode akun perusahaan
- Integration dengan Accounting System: Link ke sistem akuntansi

# Estimate Costs - Overview

- **Definisi:** Proses mengembangkan perkiraan biaya sumber daya yang dibutuhkan untuk menyelesaikan aktivitas proyek
- **Input:** Scope baseline, project schedule, risk register
- **Output:** Activity cost estimates, basis of estimates



# Faktor yang Mempengaruhi Estimasi Biaya

- **Labor Rates:** Tarif tenaga kerja (developers, analysts, managers)
- **Material Costs:** Biaya hardware, software licenses
- **Equipment Costs:** Sewa/peralatan purchase
- **Facilities Costs:** Ruang kerja, infrastruktur

# Teknik Estimasi: Analogous Estimating

- **Top-down Estimating:** Berdasarkan proyek serupa
- **Accuracy:**  $\pm 25\%$  untuk early estimates
- **When to Use:** Project selection, feasibility studies
- **Benefits:** Cepat, minimal detail required

# Teknik Estimasi: Parametric Estimating

- **Statistical Relationship:** Biaya berdasarkan parameter
- **Contoh TI:**
  - Cost per Function Point
  - Cost per Story Point
  - Cost per User Story
- **Accuracy:** Lebih akurat daripada analogous

# Teknik Estimasi: Bottom-up Estimating



**Detailed Estimating:** Estimasi setiap work package



**Accuracy:**  $\pm 10\%$  dengan detail memadai



**Effort Required:** Significant time dan resources



**When to Use:** Detailed planning phase

# Teknik Estimasi: Three-Point Estimating

- **PERT Formula:**  $(O + 4M + P) / 6$
- **Optimistic (O):** Best-case scenario cost
- **Most Likely (M):** Realistic cost estimate
- **Pessimistic (P):** Worst-case scenario cost
- **Confidence Levels:** Probability ranges



# Resource Cost Rates

- **Human Resources:** Developer rates, consultant fees
- **Material Resources:** Software licenses, hardware costs
- **Equipment Resources:** Server costs, testing equipment
- **Services:** Cloud services, external APIs

# Basis of Estimates Documentation

- **Assumptions:** Asumsi yang digunakan
- **Constraints:** Batasan yang mempengaruhi estimasi
- **Risks:** Risiko biaya yang dipertimbangkan
- **Range Estimate:** Confidence level estimates

# Estimasi Biaya dalam Agile Projects

- **Team Rate Calculation:** Average cost per sprint
- **Velocity-based Forecasting:** Cost berdasarkan delivery capacity
- **Fixed-bid Projects:** Managing constraints dengan variable scope
- **Value-based Funding:** Alokasi dana berdasarkan business value

# Determine Budget - Overview

- **Definisi:** Proses mengagregasi estimasi biaya aktivitas untuk membentuk authorized cost baseline
- **Tujuan:** Menetapkan cost baseline untuk pengukuran kinerja
- **Output:** Cost baseline, project funding requirements

## Proses Agregasi Biaya



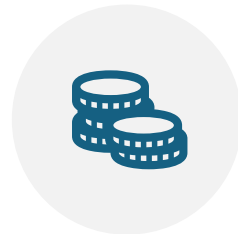
**Activity**  
**Level:** Biaya individual activities



**Work Package**  
**Level:** Agregasi ke work packages



**Control Account**  
**Level:** Grouping untuk monitoring



**Project Level:** Total project budget

# Contingency Reserve Analysis

- **Risk-based Reserves:** Berdasarkan quantitative risk analysis
- **Management Reserves:** Untuk unknown-unknowns
- **Calculation Methods:** Monte Carlo simulation, expert judgment
- **Allocation:** Distributed across work packages

# Cost Baseline Development

- **Time-phased Budget:** Alokasi biaya berdasarkan timeline
- **S-curve Representation:** Cumulative expenditure over time
- **Baseline Approval:** Formal approval dari sponsor
- **Change Control:** Proses modifikasi baseline

# Project Funding Requirements

- **Total Funding:** Jumlah total dana yang dibutuhkan
- **Funding Schedule:** Timeline pencairan dana
- **Cash Flow Management:** Manajemen arus kas proyek
- **Funding Limits:** Batasan alokasi dana periodik

# Budgeting untuk Proyek TI: Komponen Utama

- **Personnel Costs:** Gaji, benefits, overtime
- **Software Costs:** Licenses, subscriptions, royalties
- **Hardware Costs:** Servers, computers, networking equipment
- **Services Costs:** Cloud hosting, consulting, training

## Capital vs Operational Expenditure

- **CapEx:** Pengeluaran modal (aset tetap)
- **OpEx:** Pengeluaran operasional (berulang)
- **Tax Implications:** Perlakuan pajak berbeda
- **Budgeting Approach:** Strategic allocation decisions

# Cloud Cost Management

- **Pay-as-you-go Model:** Flexible pricing models
- **Resource Optimization:** Right-sizing resources
- **Cost Monitoring Tools:** AWS Cost Explorer, Azure Cost Management
- **Budget Alerts:** Automated spending notifications

## Budget Documentation

- **Budget Narrative:** Penjelasan asumsi dan pendekatan
- **Detailed Breakdown:** Itemized cost components
- **Supporting Documentation:** Quotes, rate calculations
- **Approval History:** Record of approvals

# Budget Communication

- **Stakeholder Presentation:** Presentasi budget kepada sponsor
- **Team Communication:** Sharing budget constraints dengan tim
- **Transparency Level:** Sesuai dengan kebutuhan stakeholder
- **Change Communication:** Komunikasi perubahan budget

## Control Costs - Overview

- **Definisi:** Proses memantau status proyek untuk update project budget dan mengelola perubahan cost baseline
- **Tujuan:** Mengidentifikasi variance dan mengambil tindakan korektif
- **Continuous Process:** Dilakukan throughout project lifecycle



# Change Control untuk Biaya

- **Change Requests:** Formal requests untuk budget modifications
- **Impact Analysis:** Assessment efek pada overall budget
- **Approval Process:** CCB atau sponsor approval
- **Baseline Updates:** Re-baselining jika diperlukan



# Cost Control dalam Agile Projects

- Burn Rate Monitoring: Rate of expenditure
- Value Delivery Tracking: Cost per story point/delivered feature
- Sprint Budget Adherence: Monitoring spending per sprint
- Forecast Adjustments: Regular re-forecasting berdasarkan velocity

# Reporting dan Communication

- **Cost Performance Reports:** Regular variance reporting
- **Exception Reports:** Highlight significant variances only
- **Forecast Reports:** Future budget projections
- **Stakeholder-specific Reports:** Customized untuk audience berbeda



# Corrective Actions

- **Cost Reduction Initiatives:** Identifikasi penghematan biaya
- **Scope Optimization:** Value engineering exercises
- **Process Improvements:** Efficiency enhancements
- **Resource Reallocation:** Optimal utilization of resources



# Value Engineering

- **Function Analysis:** Identifikasi fungsi esensial
- **Creative Thinking:** Alternatif solusi biaya rendah
- **Value Improvement:** Enhance value dengan cost reduction
- **Trade-off Analysis:** Balance antara cost dan performance




# Risk-based Cost Management

- **Quantitative Risk Analysis:** Probabilistic cost modeling
- **Monte Carlo Simulation:** Probability distributions
- **Contingency Planning:** Risk response funding
- **Risk Reserve Management:** Allocation dan control




# Software Cost Estimation Models

- **COCOMO II:** Constructive Cost Model
- **Function Point Analysis:** Berdasarkan functional requirements
- **Use Case Points:** Berdasarkan use case complexity
- **Story Point-based:** Agile estimation approach



# Cloud Computing Cost Optimization

- **Resource Right-sizing:** Matching resources to workload
  - **Reserved Instances:** Commitment discounts
  - **Spot Instances:** Cost-effective untuk flexible workloads
  - **Auto-scaling:** Dynamic resource adjustment
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# Outsourcing Cost Management

- **Vendor Selection:** Evaluation criteria beyond price
- **Contract Types:** Fixed-price, time-and-materials, cost-plus
- **SLA Management:** Performance-based payments
- **Change Management:** Managing scope changes dengan vendor



# Agile Budgeting Techniques

- **Lean Budgeting:** Lightweight financial governance
- **Value Stream Funding:** Funding berdasarkan value streams
- **Portfolio Budgeting:** Strategic investment allocation
- **Beyond Budgeting:** Adaptive financial management

# Cost Management Metrics dan KPI

- Cost Performance Index (CPI): Efficiency of spending
- Budget Variance: Actual vs planned spending
- Estimate Accuracy: Planned vs actual costs
- Return on Investment (ROI): Financial returns

# Tools dan Software



**Enterprise Systems:** SAP, Oracle Financials



**Project Management Tools:** MS Project, Jira dengan cost plugins



**Spreadsheet Models:** Excel dengan templates



**Cloud Cost Tools:** AWS Cost Explorer, Azure Cost Management

# Ethical Considerations

- **Accuracy:** Honest estimation dan reporting
- **Transparency:** Full disclosure of financial status
- **Compliance:** Adherence to accounting standards
- **Confidentiality:** Protection of sensitive financial data



# Cloud Cost Optimization Case Study


- **Situation:** E-commerce platform dengan fluctuating loads
- **Challenge:** High cloud costs selama peak periods
- **Solution:** Auto-scaling, reserved instances, spot instances
- **Results:** 40% cost reduction dengan maintained performance

# Outsourcing Cost Analysis

- **Onshore vs Offshore:** Cost-benefit comparison
- **Hidden Costs:** Communication, coordination, quality issues
- **Total Cost Analysis:** Beyond hourly rates
- **Success Factors:** Clear requirements, strong governance

# Agile Budgeting Success Story

- **Organization:** Financial services company
- **Challenge:** Traditional budgeting too rigid untuk digital transformation
- **Solution:** Lean budgeting dengan value-based funding
- **Benefits:** Faster time-to-market, better alignment dengan business needs



# Continuous Improvement Framework

- **Lessons Learned:** Documentation dari setiap proyek
- **Process Refinement:** Improvement berdasarkan experience
- **Tool Enhancement:** Regular evaluation dan upgrade
- **Training Development:** Financial management skills untuk tim

# Future Trends Cost Management

- **AI-powered Forecasting:** Machine learning untuk cost predictions
- **Real-time Analytics:** Live cost monitoring dengan predictive alerts
- **Blockchain:** Transparent dan auditable cost tracking
- **Sustainable Cost Management:** Environmental dan social cost considerations

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