PENGURUSAN KOS PROJEK

Version 3.0_Julai2019

KANDUNGAN

- Definisi
- Objektif
- Proses
- Penerangan Proses
- Kesimpulan
- Contoh Templat

DEFINISI

Proses merancang, menganggar, mengurus belanjawan, dan mengawal kos untuk memastikan projek siap dalam lingkungan bajet yang diluluskan.

OBJEKTIF

Sebagai mekanisme untuk memastikan projek dapat disiapkan mengikut kos yang telah ditetapkan.

Kitar Hayat Pengurusan Kos Projek

Input
- Letter of authority
- Project Brief
- Budget
- Regulations
- Standards

Activity 1
Planning

Estimate Cost
- Prepare PDA

Activity 2
Design

Determine Budget
- Value engineering if cost of project > 50 million

Activity 3
Procurement

Determine Budget
- Prepare ATDA

Activity 4
Construction

Cost Control
- S-curve: Forecast Expenditure vs Actual Expenditure
- KPK
- APK
- PHK
- Revised ATDA

Activity 5
Handover

Cost Closure
- ACDA
- Prepare final account
- Prepare elemental cost analysis

Output
- Completed Project

Note:
ACDA – As Completed Detail Abstract
ATDA – As Tendered Detail Abstract
PDA – Preliminary Detail Abstract

Proses Pengurusan Kos Projek

KUMPULAN PROSES	PROSES PENGURUSAN PROJEK
PERMULAAN	
PERANCANGAN	• Rancang Pengurusan Kos • Anggar Kos • Tentukan Bajet
PELAKSANAAN	
PEMANTAUAN & KAWALAN	Kawal Kos
PENUTUP	

Proses Pengurusan Kos Projek

Rujukan PMBok 6th Edition

Project Cost Management

Plan Cost Management	Estimate Costs
✓ **Inputs** ✓ Project Charter ✓ Project Management Plan ✓ Enterprise Environmental Factor ✓ Organizational Process Asset ✓ **Tools and Techniques** ✓ Expert Judgement ✓ Data Analysis ✓ Meetings ✓ **Output** ✓ Cost Management Plan	✓ **Inputs** ✓ Project Management Plan ✓ Project Documents ✓ Enterprise Environmental Factor ✓ Organizational Process Asset ✓ **Tools and Techniques** ✓ Expert Judgement ✓ Analogous Estimating ✓ Parametric Estimating ✓ Bottom-Up Estimating ✓ Three-Point Estimating ✓ Data analysis ✓ Project Management Information System ✓ Decision making ✓ **Outputs** ✓ Cost Estimate ✓ Basis of Estimates ✓ Project Document Updates

Proses Pengurusan Kos Projek

Rujukan PMBok 6th Edition

Project Quality Management

Determine Budget	Control Costs
✓ **Inputs** ✓ Project Management Plan ✓ Project Documents ✓ Business Documents ✓ Agreements ✓ Enterprise Environmental Factor ✓ Organizational Process Asset ✓ **Tools and Techniques** ✓ Expert Judgement ✓ Cost Aggregation ✓ Data Analysis ✓ Historical Information Review ✓ Funding Limit Reconciliation ✓ Financial ✓ **Output** ✓ Cost Baseline ✓ Project Funding Requirements ✓ Project Documents Updates	✓ **Inputs** ✓ Project Management Plan ✓ Project Documents ✓ Project Funding Requirements ✓ Work Performance Data ✓ Organizational Process Asset ✓ **Tools and Techniques** ✓ Expert Judgement ✓ Data analysis ✓ To-complete Performance Index ✓ Project Management Information System ✓ **Outputs** ✓ Work Performance Information ✓ Cost Forecasts ✓ Change Requests ✓ Project Management Plan Updates ✓ Project Document Updates

Proses 1: Rancang Pengurusan Kos

- Proses melibatkan bagaimana kos projek dianggarkan, dibajetkan, diurus, dipantau dan dikawal.
- Manfaat utama proses ini ialah memberi panduan dan hala tuju bagaimana kos projek akan diurus di sepanjang pelaksanaan projek.

Rancang Pengurusan Kos

Amalan JKR

Input

1. Piagam Projek: cth. Surat Kuasa Pelaksanaan Projek
2. *Project Management Plan: cth. Q-plan*
3. Faktor Persekitaran Jabatan: Surat Arahan & Pekeliling Kerajaan
4. Proses Aset Jabatan: Sistem Kualiti JKR (SPK JKR), Garis panduan, Pangkalan Data & *Lesson Learned, Ratol, Standard & Cost, Schedules of Rates, Master Bills, MyCESMM,*

Plan Cost Management

- ✓ **Inputs**
  - ✓ Project Charter
  - ✓ Project Management Plan
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Data Analysis
  - ✓ Meetings
- ✓ **Output**
  - ✓ Cost Management Plan

Rancang Pengurusan Kos

Amalan JKR

Tools & Techniques

1. Penilaian pakar
2. Data Analysis: Penentuan pemilihan sumber projek, cth. laksana secara dalaman atau melantik perunding luar
3. Mesyuarat

Outputs

1. Pelan Pengurusan Kos: PDA, ATDA & *Financial S-Curve*

Plan Cost Management

- ✓ **Inputs**
  - ✓ Project Charter
  - ✓ Project Management Plan
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Data Analysis
  - ✓ Meetings
- ✓ **Output**
  - ✓ Cost Management Plan

Proses 2: Anggar Kos

- Proses menyediakan anggaran kos yang diperlukan untuk menyiapkan sesuatu projek.
- Untuk menentukan amaun kos yang diperlukan untuk menyiapkan kerja.

Anggar Kos

Amalan JKR

Input

1. Pelan Pengurusan Kos: Q-plan (Item 1.3 - Butiran Kewangan/Sumber Pembiayaan)
2. Projects Documents: Lesson learned, Jadual Kerja, keperluan sumber dan daftar/mitigasi risiko
3. Faktor Persekitaran Jabatan
4. Aset Proses Jabatan

Estimate Costs

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Analogous Estimating
  - ✓ Parametric Estimating
  - ✓ Bottom-Up Estimating
  - ✓ Three-Point Estimating
  - ✓ Data analysis
  - ✓ Project Management Information System
  - ✓ Decision making
- ✓ **Outputs**
  - ✓ Cost Estimate
  - ✓ Basis of Estimates
  - ✓ Project Document Updates

Anggar Kos

Amalan JKR

Tools & Techniques

1. Teknik anggaran kos
2. Analisis Data : cth. Analisa dokumen tender atau pra-bidaan
3. Perisian pengurusan projek: cth. J-nilai
4. Membuat keputusan

Outputs

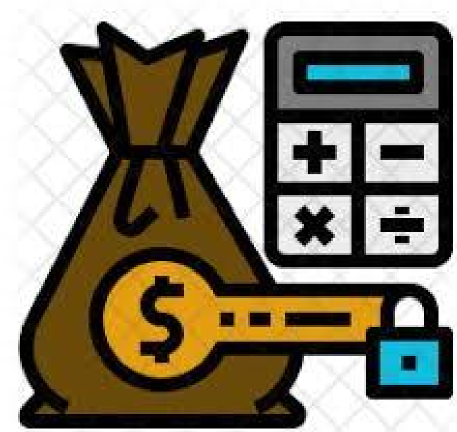
1. Anggaran kos
2. Asas anggaran
3. Dokumen projek kemaskini

Estimate Costs

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Analogous Estimating
  - ✓ Parametric Estimating
  - ✓ Bottom-Up Estimating
  - ✓ Three-Point Estimating
  - ✓ Data analysis
  - ✓ Project Management Information System
  - ✓ Decision making
- ✓ **Outputs**
  - ✓ Cost Estimate
  - ✓ Basis of Estimates
  - ✓ Project Document Updates

Proses 3: Tentukan Bajet

- Proses menjumlahkan anggaran kos bagi keseluruhan aktiviti atau pakej kerja untuk mendapatkan kos projek (kos *baseline).*
- Kos *baseline* ini akan digunakan sebagai perbandingan dalam pemantauan dan kawalan kos.



Tentukan Bajet

Amalan JKR

Input

1. Pelan Pengurusan Projek: Q-Plan
2. Dokumen Projek: cth. ATDA & Financial S-curve
3. Dokumen Tadbir Urus: cth, Outcome Based Budgeting, Pelan Strategik, Pelan Bisnes,
4. Perjanjian:unjuran perbelanjaan tahunan (waran peruntukan), SKPP (Surat Kuasa Pelaksanaan Projek)
5. Faktor Persekitaran Jabatan
6. Aset Proses Jabatan

Determine Budget

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Business Documents
  - ✓ Agreements
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Cost Aggregation
  - ✓ Data Analysis
  - ✓ Historical Information Review
  - ✓ Funding Limit Reconciliation
  - ✓ Financial
- ✓ **Output**
  - ✓ Cost Baseline
  - ✓ Project Funding Requirements
  - ✓ Project Documents Updates

Tentukan Bajet

Amalan JKR

Tools & Techniques

1. Penilaian pakar
2. Penjumlahan kos: jumlah kos dari BQ,
3. Analisa Data: cth. Analisa kos luar jangka, pengalihan utiliti,
4. Rujukan maklumat/data projek lepas
5. Penyelarasan had pembiayaan: semak semula kos siling projek
6. Sumber pembiayaan: bajet pembangunan, bajet swasta (PFI), bank dunia

Determine Budget

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Business Documents
  - ✓ Agreements
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Cost Aggregation
  - ✓ Data Analysis
  - ✓ Historical Information Review
  - ✓ Funding Limit Reconciliation
  - ✓ Financial
- ✓ **Output**
  - ✓ Cost Baseline
  - ✓ Project Funding Requirements
  - ✓ Project Documents Updates

Tentukan Bajet

Amalan JKR

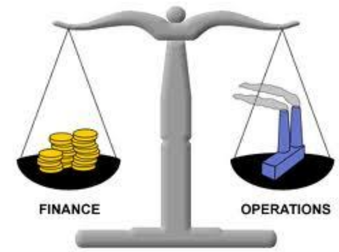
Outputs

1. Cost baseline: siling projek
2. Project Funding Requirements: unjuran kewangan sukuan/tahunan
3. Project Management Updates: ATDA, CPM & Financial S-curve, daftar/mitigasi risiko

Determine Budget

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Business Documents
  - ✓ Agreements
  - ✓ Enterprise Environmental Factor
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Cost Aggregation
  - ✓ Data Analysis
  - ✓ Historical Information Review
  - ✓ Funding Limit Reconciliation
  - ✓ Financial
- ✓ **Output**
  - ✓ Cost Baseline
  - ✓ Project Funding Requirements
  - ✓ Project Documents Updates

Proses 4: Kawal Kos



- Proses memantau status projek bagi tujuan mengemaskini kos projek dan mengurus perubahan kepada kos *baseline*.
- Menyediakan kaedah untuk mengenalpasti varians di antara perancangan berbanding sebenar bagi membolehkan tindakan pembetulan diambil dan juga meminimakan risiko.

Kawal Kos

Amalan JKR

Input

1. Pelan Pengurusan Projek: Q-Plan
2. Dokumen Projek: cth. ATDA & Financial S-curve
3. Data kemajuan kerja: laporan kemajuan kewangan/nilai kerja dilaksana,
4. Faktor Persekitaran Jabatan: Arahan KPKR, Arahan Perbendaharaan
5. Aset Proses Jabatan: APK, PHK,

Control Costs

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Project Funding Requirements
  - ✓ Work Performance Data
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Data analysis
  - ✓ To-complete Performance Index
  - ✓ Project Management Information System
- ✓ **Outputs**
  - ✓ Work Performance Information
  - ✓ Cost Forecasts
  - ✓ Change Requests
  - ✓ Project Management Plan Updates
  - ✓ Project Document Updates

Kawal Kos

Amalan JKR

Tools & Techniques

1. Penilaian pakar
2. Analisa Data: cth. Kewangan S-curve (rancang vs sebenar)
3. Baki peruntukan diterima untuk menyiapkan projek
4. Sistem maklumat pengurusan projek: cth. SKALA, iGFMAS

Outputs

1. Laporan Kemajuan Kewangan
2. Kos ramalan/jangkaan
3. Permohonan perubahan
4. Pelan Pengurusan Projek Kemaskini
5. Dokumen Projek Kemaskini

Control Costs

- ✓ **Inputs**
  - ✓ Project Management Plan
  - ✓ Project Documents
  - ✓ Project Funding Requirements
  - ✓ Work Performance Data
  - ✓ Organizational Process Asset
- ✓ **Tools and Techniques**
  - ✓ Expert Judgement
  - ✓ Data analysis
  - ✓ To-complete Performance Index
  - ✓ Project Management Information System
- ✓ **Outputs**
  - ✓ Work Performance Information
  - ✓ Cost Forecasts
  - ✓ Change Requests
  - ✓ Project Management Plan Updates
  - ✓ Project Document Updates

Prosedur Kawalan Kos

Surat Arahan KPKR Bil. xx/xxxx

- 10% daripada kos kontrak (kelulusan SO)
- 30% daripada kos kontrak (kelulusan KPKR
- selebihnya (kelulusan Menteri Kewangan)

Contoh Pelan Pengurusan Kos

Pengurusan Kos

JKR	PENGURUSAN PROJEK	Rujukan : JKR.PMMM.23
		Mukasurat No : 1
		Isu No : 1
		Semakan No : 5
	Pengurusan Kos	Tarikh : 28.02.2010

PROJEK :	
NAMA & JAWATAN PENGURUS PROJEK :	TARIKH DISEDIAKAN:

Bajet/Kewangan Projek

Bajet Yang Diperuntukkan / Kos Siling (i)	
Kos Projek (ii)	
Kos Kontrak (iii)	

Bulan		Kos Perbelanjaan Sebenar				Varian
	Unjuran Bajet (a)	Kos Diluar Kontrak (b)	Kos Kontrak (C)	Kos Perubahan Kerja (d)	Jumlah Kos Perbelanjaan Sebenar (e) = (b) + (c)+ (d)	Varian Kos (f) = (a) - (e)
					0.00	0.00
					0.00	0.00
					0.00	0.00
						0.00
Jumlah (RM)	0.00	0.00	0.00	0.00	0.00	0.00

DISEDIAKAN OLEH :	T/TANGAN	
DISEMAK OLEH :	T/TANGAN	

prokom PROJECT MANAGEMENT EXCELLENCE

JKR.PMMM.05

Contoh: PDA

PRELIMINARY DETAILED ABSTRACT FOR (PDA No.1)

HEAD	SUB-HEAD	YEAR	TOTAL PROVISION	RM	########
		2008	PROVISION FOR CONSTRUCTIOI		########

BRIEF DESCRIPTION OF BUILDINGS

	BUILDING	Frame	Vall	Roof	Floor	Ceiling	Vindov	Standard
a	New Block of Hostel	RC	BK	M.D	VT, HT, CR	MFB, PGC, PF	CSMT,LV	Normal
b	New Main Lecture Hall	RC	BK	M.D	VT, HT, CR	MFB, PGC, PF	CSMT,LV	Normal
c	New Faculty For Science And	RC	BK	M.D	VT, HT, CR	MFB, PGC, PF	CSMT,LV	Normal
d	New Faculty For Managemen	RC	BK	M.D	VT, HT, CR	MFB, PGC, PF	CSMT,LV	Normal
e	New Centre For Foundation S	RC	BK	M.D	VT, HT, CR	MFB, PGC, PF	CSMT,LV	Normal

1	PRELIMINARIES				9,726,000.00
2	PILING/SPECIAL FOUNDATION				5,439,000.00
	Type/size :				
					5,439,000.00
3	BUILDING	Drawing No.	Floor Area M2	Cost / M2	36,258,000.00
a	New Block of Hostel	.	18,354.00	910.00	16,702,000.00
b	New Main Lecture Hall	.	5,606.90	1,650.00	9,251,000.00
c	New Faculty For Science And		5,276.83	830.00	4,380,000.00
d	New Faculty For Managemen		2,431.91	830.00	2,018,000.00
e	New Centre For Foundation S		4,707.17	830.00	3,907,000.00
4	INTERNAL SERVICES				14,500,000.00
a	Electrical Works				14,500,000.00
b	Mechanical Works				
c	Sanitary Appliances (Incld. in bldg)				
	SUBTOTAL carried forward				65,923,000.00

Contoh: ATDA

(PWD 142B - Rev. '91)

JABATAN KERJA RAYA

AS TENDERED DETAILED ABSTRACT FOR		Total Amount of Main Tender:	############
		Contractor for Main Works	Class A
Head Sub/Head Year PFI 2008	Total Provision ############### Prov. for Construction ##############	Closing Date of Tender 22/05/2008	Tender Valid Until 22/11/2008

Contract Period:		Competitive Tender List			
99 WEEKS		Tender No.	Tender Sum (RM)	Tender No.	Tender Sum (RM)
Type of Contract :	Design & Build	2/12	57,129,890.25	5/12	89,918,397.84
Form of Contract :	PWD Form DB/T - Rev. 2007	6/12	73,814,771.00	12/12	90,479,569.39
Basis of Tender :	Open Tender	11/12	78,578,896.51	9/12	96,276,132.88
No. of Tender Received:	12	4/12	78,831,649.00	7/12	96,800,000.00
		3/12	86,184,616.76	10/12	98,643,602.00
		8/12	89,195,096.80	1/12	(Disqualified)

BRIEF DESCRIPTION OF BUILDINGS

	BUILDING	Frame	Wall	Roof	Floor	Ceiling	Window	Standard
	Blok Akademik	RC/PCM	Bk/PCM/PF	Al/Co.T	Con./PCM/CT/HT	Al/AB	CSMT	Normal
	Blok Asrama							
a.	Satu (1) Blok Asrama 4 Bilik (1000 Pelajar)	RC/PCM	Bk/PCM/PF	Al/Co.T	Con./PCM/CT/HT	T/AB	CSMT	Normal
b.	Dewan Makan	RC	Bk/PF	Al/Co.T	Con./CT/HT	T/AB	CSMT	Normal

1	**PRELIMINARIES & DESIGN & BUILD ELEMENT**	13,403,500.00	Being 18.36 % of Remainder of Main Tender					
2	**PILING/SPECIAL FOUNDATION**	3,173,149.60	Unit		Quantity		Unit Cost	
	R.C. Piles - 150mm x 150mm, 200mm x 200mm, Micropile - 250mm & Spun Piles - 350mm		m2		30,182.00		105.13	
3	**BUILDING**	39,491,407.85	Drawing No.	Floor Area m2	Cost/m2	Vol.m3*	Cost/m3*	
	Blok Akademik	18,213,423.30	SA/PRE/2008/WDB1 and series	13,723.00	1,342.00			
	Blok Asrama							
a.	Satu (1) Blok Asrama 4 Bilik (1000 Pelajar)	17,662,984.55	SA/PRE/2008/WDB1 and series	16,459.00	1,073.15			
b.	Dewan Makan		SA/PRE/2008/WD-DW and series					
c.	Bangunan Sokongan	215,000.00	SA/PRE/2008/WD-RP and series					
			SA/PRE/2008/WD-RT and series					
	Build In & Loose Furniture, Acoustic Treatment To Lecture Hall							
d.	Loose Furniture, Office System & Signage (Prov. Sum)	2,000,000.00	SA/PRE/2008/WDB1 and series					
e.	Built In Furniture/Acoustic Treatment	1,400,000.00						
	* Maintenance for building is under item 6.a							

Page 1

Contoh: ACDA

JABATAN KERJA RAYA

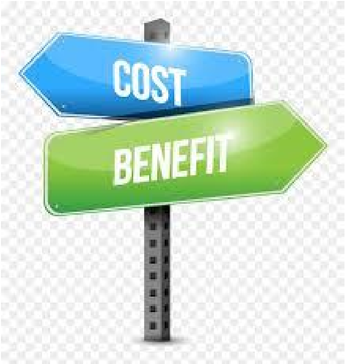
AS COMPLETED DETAILED ABSTRACT FOR		Total Amount of Main Tender: RM –	
		Contractor for Main Works	Class
		Date of Possession of Site	Actual Date of Completion
		Original Contract Period	
		Extension of Time (if any)	
Head Sub/Head Year	Total Prov. RM Prov. for Con: RM	Amount of L&A Damages (if any)	

	BRIEF DESCRIPTION OF BUILDINGS							
	BUILDING	Frame	Wall	Roof	Floor	Ceiling	Window	Standard
a								
b								
c								
d								
e								
f								

	PRIME COST AND PROVISIONAL SUMS		
	ITEM	ALLOWED RM	ACTUAL RM
a			
b			
c			
d			
e			
f			
g			
h			

	BREAKDOWN OF COST	**COST RM**					
1	PRELIMINARIES		Being #### % of Remainder of Main Tender				
2	PILING/SPECIAL FOUNDATION Type and Size	–	Unit	Quantity		Unit Cost	
a							
b							
c							
3	BUILDING	–	Drawing No.	Floor Area m2	0 Cost/m2	Vol.m3"	Cost/m3"
a							
b							
c							
d							
e							
f							
g							
	SUBTOTAL **carried forward**	–					

KESIMPULAN



- Pengurusan kos projek bertujuan untuk memastikan projek disiapkan mengikut kos yang telah ditetapkan.
- Pengurusan kos projek yang efektif perlu mematuhi proses, alatan dan teknik yang telah disediakan di dalam SPK, garis panduan dan pekeliling-pekeliling berkenaan.

TERIMA KASIH

Version 3.0_Julai2019

"It's Not What You Pay A Man, But What He Costs You That Counts"- Will Rogers

Latihan:

Berdasarkan maklumat kes projek yang diberi, sediakan:

i) PDA (anggaran kos awalan)
ii) ATDA (abstrak kos seperti ditender)
iii) ACDA (abstrak kos seperti disiapkan)
iv) Pengurusan Kos

WHEN YOU LOSE
INTEREST IN ANYTHING,
YOU ALSO LOSE THE
MEMORY FOR IT