

Week-03-L-05

Value Engineering Agricultural Plan

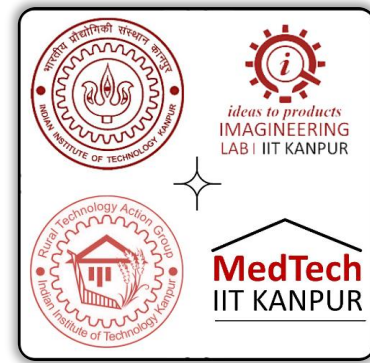
Function Phase Continuation

Function Cost Matrix (FCM), and

Value Improvement Potential (VIP)

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Numerical Evaluation for Knapsack Sprayer

✓ (14)

Key Letters	Functions
A	Store Solution ✓
B	Secure Closure ✓
C	Generate Pressure ✓
D	Transport Solution
E	Control Flow
F	Target Spraying
G	Spray Solution ✓
H	Perform Pumping
I	Secure Attachment
J	Ensure Filter
K	Generate Motion ✓
L	Transfer Force
M	Dispense Solution ✓
N	Apply Force ✓

Highest weight

Evaluation Weight Factor (Difference in Importance)	
1	Minor Difference
2	Medium Difference
3	Major Difference

	B	C	D	E	F	G	H	I	J	K	L	M	N	T. Wt	Adj. Wt $\frac{x_i}{\sum x_i}$	% Wt $\frac{x_i}{\sum x_i} \times 100$	
A	A2	A1	D1	E1	A2	G3	H2	A1	A3	A1	A2	A1	A1	14	15	15/179 x 100 = 8.38	
B		C2	D2	E1	F1	G3	H2	I2	B2	K2	L2	M2	N1	2	3		
C			C2	C2	C1	G3	C1	C2	C3	K1	C2	C1	C1		4		
D				E1	D2	G2	D1	D2	D3	K2	D1	M2	D1		11		
E					E3	G3	E3	E3	E3	K1	E2	M2	E2				
F						G2	G2	D1	F2	K2	L2	M2	N1				
G							G3	G3	G3	G2	G3	G1	G2				
H								H2	H3	K2	H1	M1	H1		11		
I									I2	K1	I2	M1	I2				
J										K2	L2	M2	N2		0	1	
K											K1	K2	N2				
L												M1	N1				
M													M2				
N																	
																179	$\sum x_i$

Function Cost Matrix (FCM)

- **Function Identification:** Assess the importance of each function.
- **Cost Analysis:** List functions in the Function-Cost matrix for cost determination.
- **Systematic Evaluation:** Use the matrix to analyze functions in relation to costs.
- **Cost Savings Opportunities:** Identify areas for value improvement and cost reduction.
- **Prioritization Tool:** Utilize the matrix visually to prioritize improvement areas.
- **Informed Decision-Making:** Understand cost implications for each function and component.
- **Value Engineering:** Achieve a balanced product by optimizing performance and cost.

How to create FCM?

1. **Identify Functions** : *List*
2. **Component Listing** : *BoM*
3. **Cost Assignment** : *Estimate cost*
4. **Matrix Creation** :
5. **Analysis** :
6. **Value Optimization** : *Enhance functions*
7. **Value Engineering** :

No	Name	Name	Cost

FCM for Knapsack Sprayer

Part Name	Material Cost	Store Solution	Secure Closure	Generate Pressure	Transport Solution	Control Flow	Target Spraying	Spray Solution	Perform Pumping	Secure Attachment	Ensure Filter	Generate Motion	Transfer Force	Dispense Solution	Apply Force
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Tank	850	595	42.5	85	127.5										
Tank Lid	20		20												
Pump	350			175					70			35	35		35
Hose	120														
Trigger	45														
Lance/Wand	120														
Nozzle	15														
Pump Handle	65														
Straps	35														
Filter	10														
Sum	1630		62.5												
% Cost	100%		3.83%												

S.No. Bot.

No. of Cost

$$(62.5 / 1630 \times 100)$$

Numerical Evaluation for Knapsack Sprayer

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	B	C	D	E	F	G	H	I	J	K	L	M	N	T. Wt ↓	Adj. Wt ↓	% Wt
A	A2	A1	D1	E1	A2	G3	H2	A1	A3	A1	A2	A1	A1	14	15	8.38
B		C2	D2	E1	F1	G3	H2	I2	B2	K2	L2	M2	N1	2	3	1.68
C			C2	C2	C1	G3	C1	C2	C3	K1	C2	C1	C1	17	18	10.06
D				E1	D2	G2	D1	D2	D3	K2	D1	M2	D1	13	14	7.82
E					E3	G3	E3	E3	E3	K1	E2	M2	E2	19	20	11.17
F						G2	G2	I1	F2	K2	L2	M2	N1	3	4	2.23
G							G3	G3	G3	G2	G3	G1	G2	33	34	18.99
H								H2	H3	K2	H1	M1	H1	11	12	6.70
I									I2	K1	I2	M1	I2	9	10	5.59
J										J2	L2	M2	N2	0	1	0.56
K											K1	K2	N2	16	17	9.5
L												M1	N1	6	7	3.91
M													M2	15	16	8.94
N														7	8	4.47
														179	100	

Evaluation Weight Factor (Difference in Importance)	
1	Minor Difference
2	Medium Difference
3	Major Difference

Value Improvement Potential (VIP) Index

- The Value Improvement Potential (VIP) index prioritizes improvement opportunities for efficiency.
- The numerical VIP index aids in efficient resource allocation.
- This systematic approach guides value engineering teams in optimizing the balance between performance, quality, and cost.
- Functions with a VIP Index over '1' are considered 'poor value.'

Poor Value Functions

- Poor Value Functions: Contribute little to overall product or system value.
- **Traits:**
 - a. Low Customer Importance:**
 - b. High Cost, Minimal Benefit:**
 - c. Redundancy/Over-Engineering:**
 - d. Outdated or Unused Features:**

FCM_A for Knapsack Sprayer

with VIP

		Store Solution	Secure Closure	Generate Pressure	Transport Solution	Control Flow	Target Spraying	Spray Solution	Perform Pumping	Secure Attachment	Ensure Filter	Generate Motion	Transfer Force	Dispense Solution	Apply Force
Part Name	Material Cost	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Tank	850	595	42.5	85	127.5										
Tank Lid	20		20												
Pump	350	↓		175					70			35	35		35
Hose	120				72			12						36	
Trigger	45					36								4.5	4.5
Lance/W and	120		↓		12		96							12	
Nozzle	15							15							
Pump Handle	65			6.5					32.5			13	6.5		6.5
Straps	35									28			7		
Filter	10										10				
	1630	595	62.5	266.5	211.5	36	96	27	102.5	28	10	48	48.5	52.5	46
% Cost		36.50	3.83	16.35	12.98	2.21	5.89	1.66	6.29	1.72	0.61	2.94	2.98	3.22	2.82
%Weight		8.38	1.68	10.06	7.82	11.17	2.23	18.99	6.7	5.59	0.56	9.5	3.91	8.94	4.47
VIP Index		4.36	2.28	1.63	1.66	0.20	2.64	0.09	0.94	0.31	1.10	0.31	0.76	0.36	0.63

VIP =
% Cost
/ % Weight

→
→

✓ (4.36) (2.28) (1.63) (1.66) (0.20) (2.64) (1.10)

Poor Value functions of Knapsack Sprayer

Poor value functions of Knapsack Sprayer are:

- 1 Store Solution
- 2 Secure Closure
- 3 Create Pressure
- 4 Transport Solution
- 5 Target spraying
- 6 Bore Filter



Thank You

