

Week-03-L-01

# Value Engineering Agricultural Plan

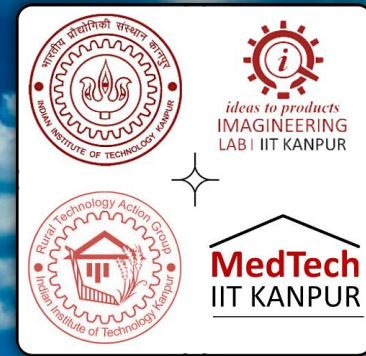
## Function Phase Continuation

## Functional Analysis & System Technique (FAST)

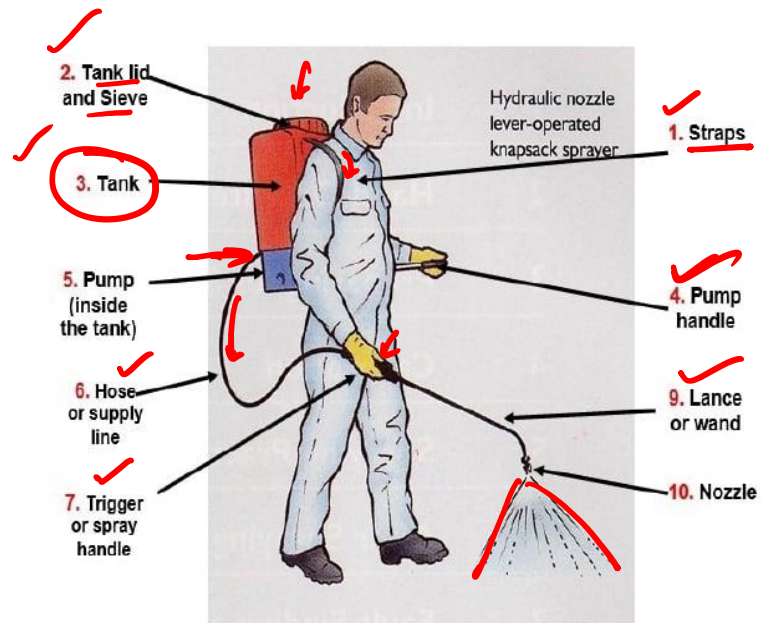
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**Dr. Amandeep Singh**

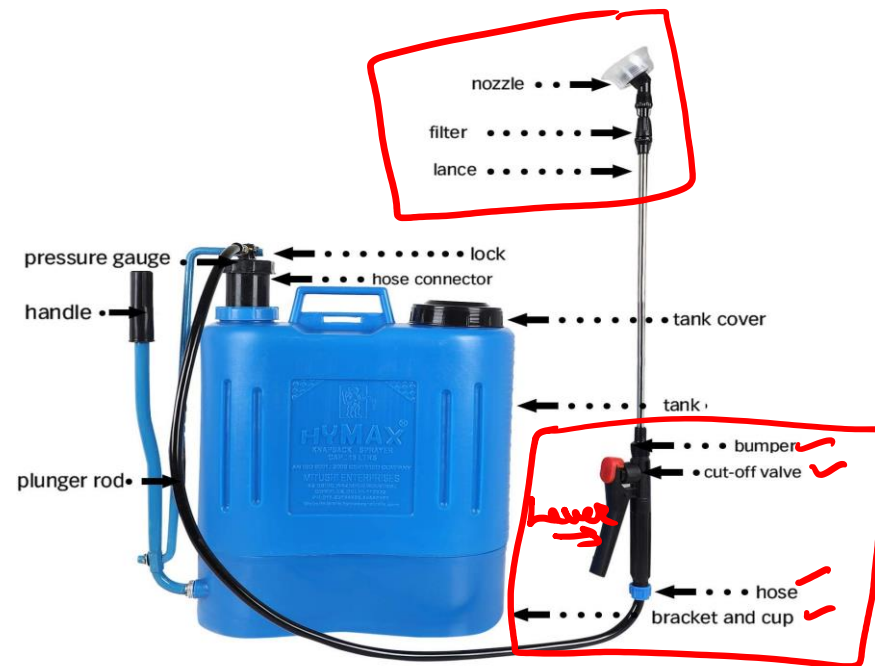
Dept. of Mechanical Engineering  
Indian Institute of Technology Kanpur



# Knapsack Sprayer



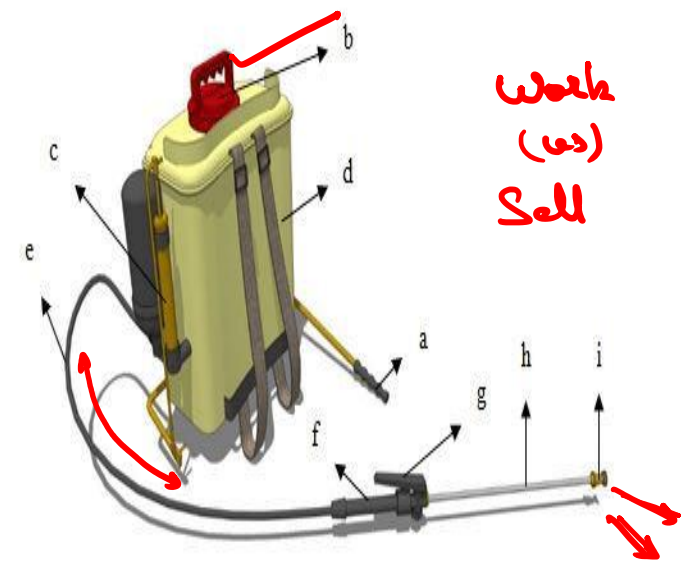
Source: [www.facebook.com/aakgrow.croplifekenya/](http://www.facebook.com/aakgrow.croplifekenya/)



Source: [www.amazon.in/HYMAX-Sanitizer-Sprayer-Pressure-Complex](http://www.amazon.in/HYMAX-Sanitizer-Sprayer-Pressure-Complex)

# Function Definition Worksheet: Knapsack Sprayer

Sr. No	Part Name	Function Definition		Function Location			
		Verb	Noun	Part		Assembly	
				Primary	Secondary	Primary	Secondary
1.	Tank	Store	Solution	✓			✓
		Resist	Corrosion		✓		✓
		Prevent	Leakage		✓		✓
2.	Tank Lid	Secure	Closure	✓			✓
		Allow	Opening		✓		✓
		Allow	Inspection		✓		✓
3.	Pump	Generate	Pressure	✓			✓
		Control	Flow		✓		✓
		Generate	Motion		✓		✓
4.	Hose	Transport	Liquid	✓			✓
		Dispense	Solution		✓		✓
		Enable	Extension		✓		✓
5.	Trigger	Control	Flow	✓			✓
		Apply	Force		✓		✓
		Activate	Spray		✓		✓
6.	Lance/Wand	Target	Spraying	✓			✓
		Dispense	Solution		✓		✓
		Provide	Extension		✓		✓
7.	Nozzle	Spray	Solution	✓		✓	✓
		Distribute	Spray		✓		✓
		Control	Flow		✓		✓
8.	Pump Handle	Perform	Pumping	✓			✓
		Apply	Force		✓		✓
		Generate	Motion		✓		✓
		Transfer	Force		✓		✓
9.	Straps	Secure	Attachment	✓			✓
		Distribute	Weight		✓		✓
		Transfer	Force		✓		✓
10.	Filter	Ensure	Filter	✓			✓
		Prevent	Clog		✓		✓
		Remove	Debris		✓		✓



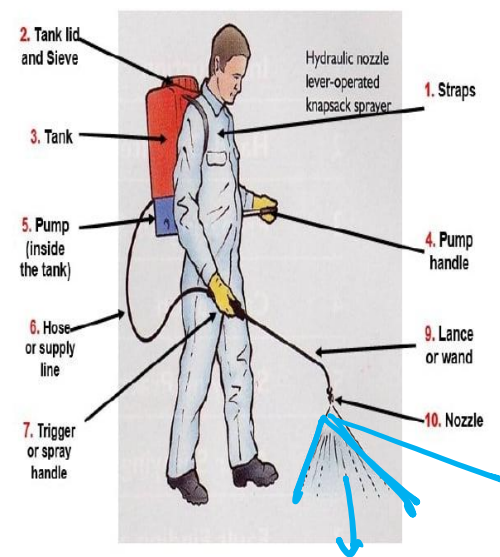
Work  
(as)  
Sell

### Functions:

- 1 Store Solution
- 2 Secure Closure
- 3 Generate Pressure
- 4 Transport Liquid
- 5 Control Flow
- 6 Target Spraying
- 7 Spray Solution
- 8 Perform Pumping
- 9 Secure Attachment
- 10 Ensure Filter
- 11 Generate Motion
- 12 Transfer Force
- 13 Dispense Solution
- 14 Apply Force

# Work and Sell Functions

Sr. No	Part Name	Work Function	Sell Function
1.	Tank	Store Solution	Resist Corrosion (Durable Material, Leak-proof)
2.	Tank Lid	Secure Closure	Easy Access
3.	Pump	Generate Pressure	Easy Operation
4.	Hose		Flexible Length
5.	Trigger		Precise Operation
6.	Lance/Wand		Adjustable Length
7.	Nozzle		Variable patterns
8.	Pump Handle		Easy Pumping Comfortable Grip
9.	Straps		Comfortable Fit
10.	Filter		Prevent Clogging

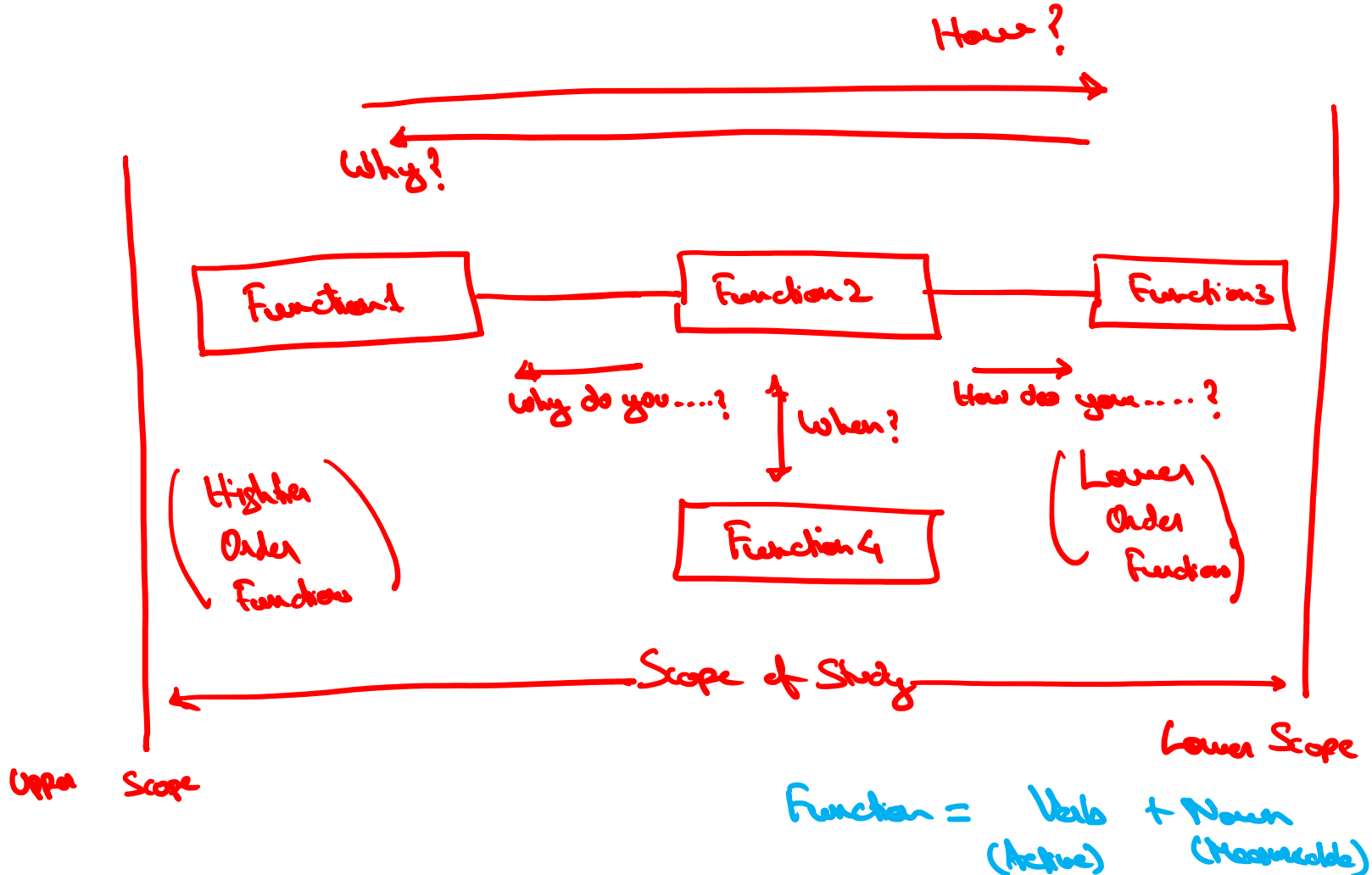


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# Evaluating Functional Relationships

- FAST diagrams break down systems into constituent functions, revealing interrelationships.
- They provide a structured approach to:
  - understand & enhance system functionality,
  - identifying areas for cost savings & value improvements.

# Evaluating Functional Relationships



Thank You

