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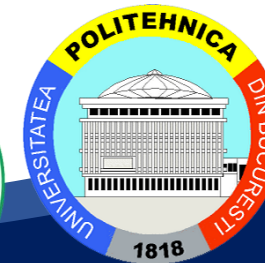


Course 15: Customer Experience-Driven Design

Module 2: Customer Experience Value Creation

Topic 4: Co-Creation

Pisut Koomsap (AIT), Duangthida Hussadintorn Na Ayutthaya (AIT)

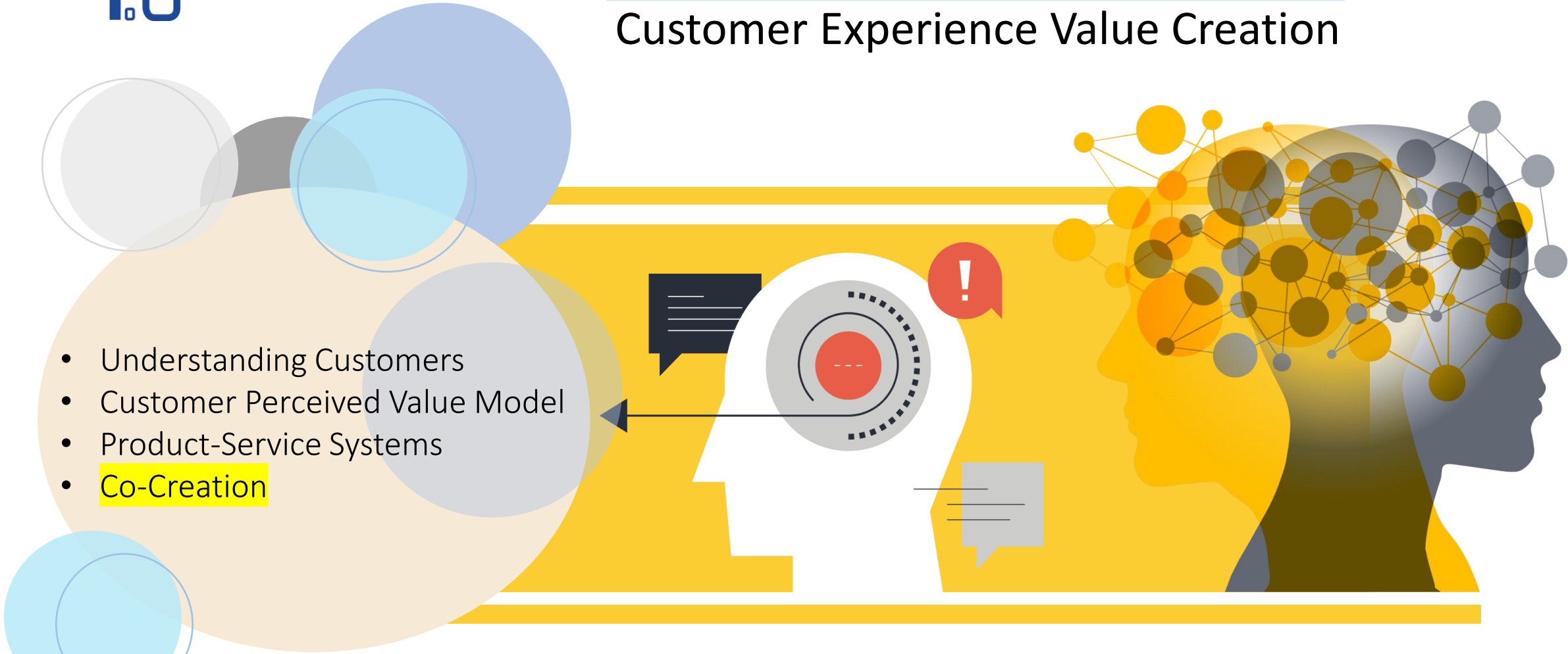


Curriculum Development
of Master's Degree Program in
Industrial Engineering for Thailand Sustainable Smart Industry

Module II

Customer Experience Value Creation

- Understanding Customers
- Customer Perceived Value Model
- Product-Service Systems
- **Co-Creation**



Traditional NPD

Primary Role —————
 Supportive Role - - - - -

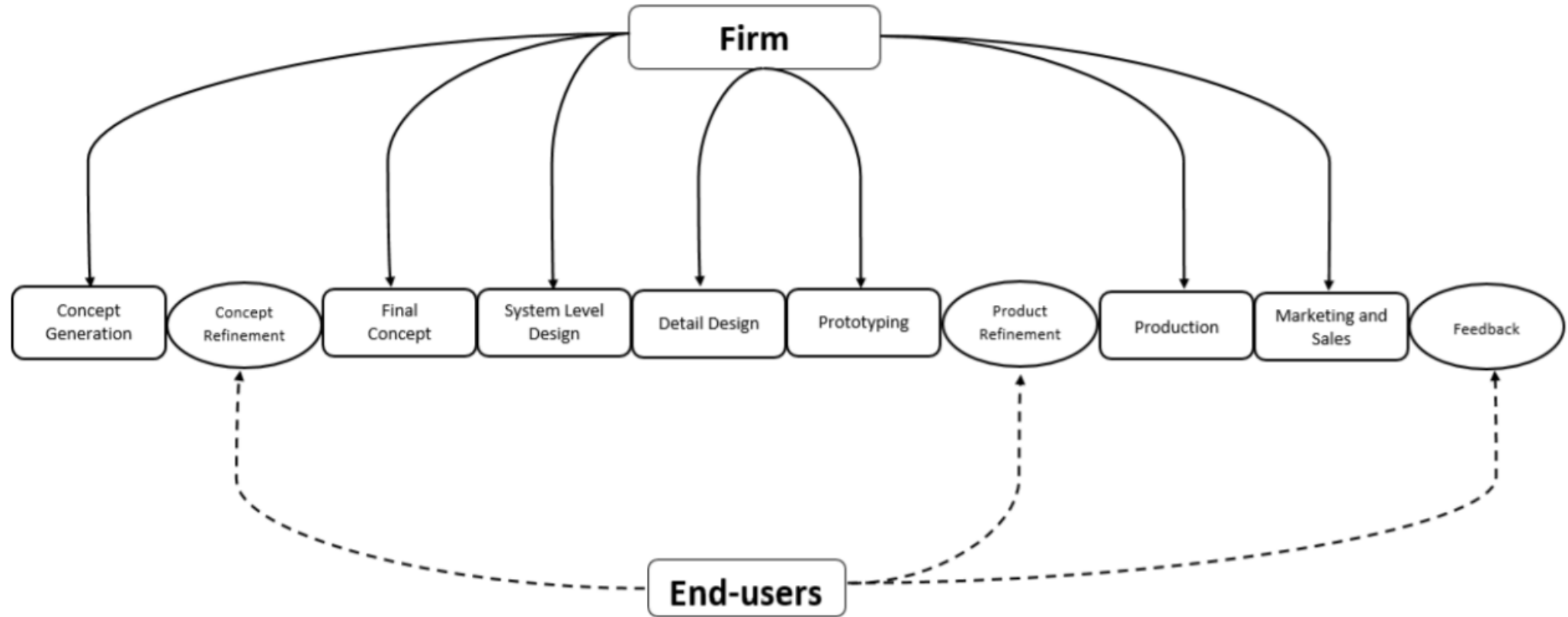


Fig. 1. Role of end-users in traditional NPD process.

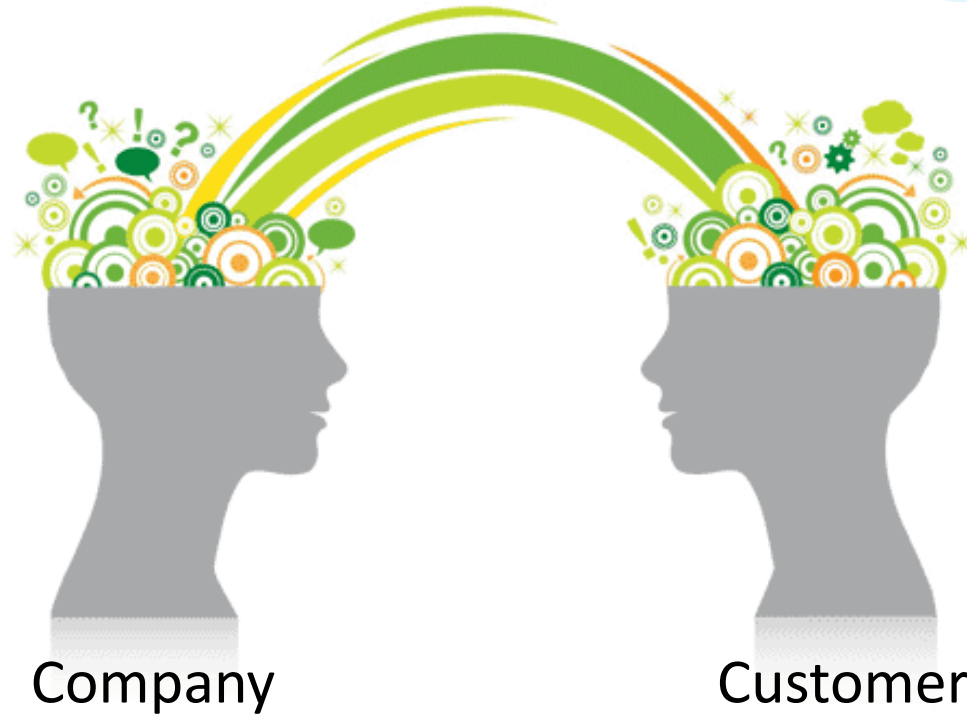


How are your customers today?

Involve them in the process






Co-creation










Build your own.



1. Engine 70 hp	2. Vehicle type Coupe panoramic roof	3. Model passion	4. Wheels 9-spoke
5. bodypanels deep black	6. tridion silver	7. Interior design black	8. Extras -

 pure Base price: \$ 13,270.00	 passion Base price: \$ 14,930.00	 electric drive Base price: \$ 25,000.00
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 design black N/C	 design red N/C	 design beige N/C	 Black leather seating surfaces (only available ... N/C
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 6-Spoke alloy wheels front: 165/60 R15; rear: 1... \$ 250.00	 BRABUS 6-twin-spoke alloy wheels in silver, fro... \$ 550.00	 BRABUS 6-twin-spoke alloy wheels in black, iron... \$ 550.00
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Co-Creation NPD

Primary Role ———
 Supportive Role - - - - -

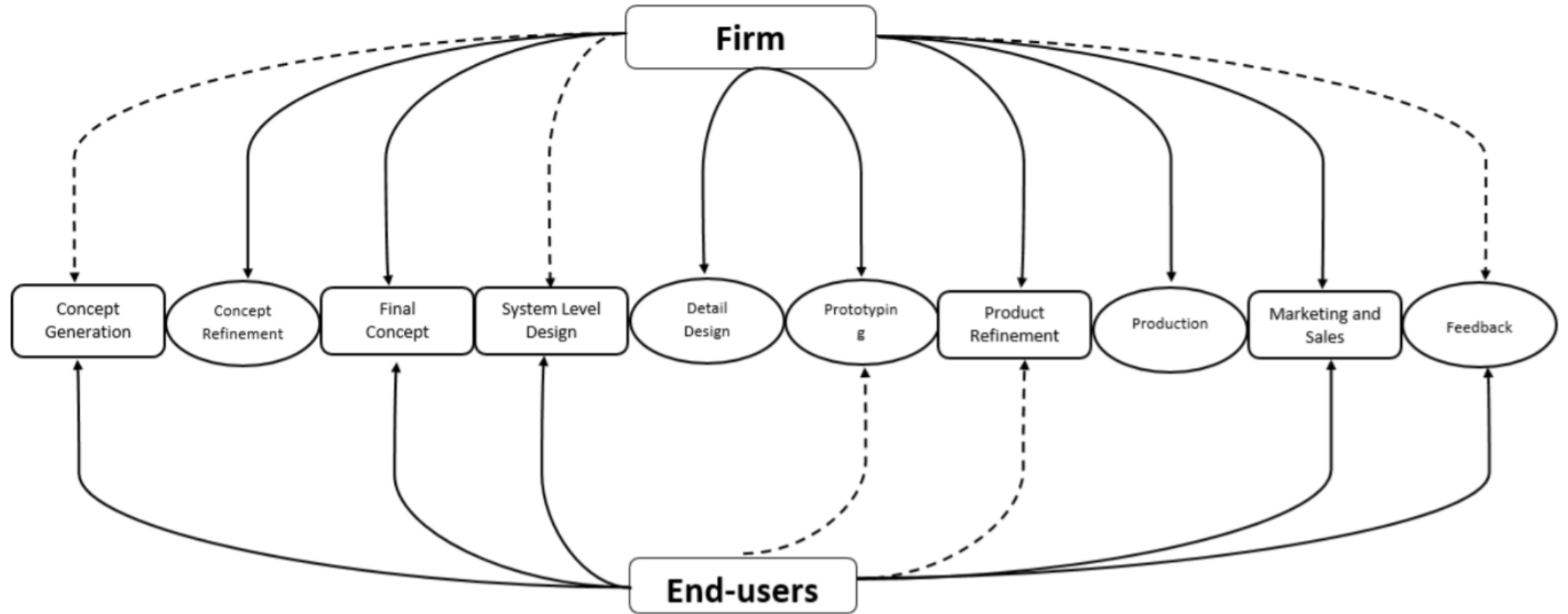
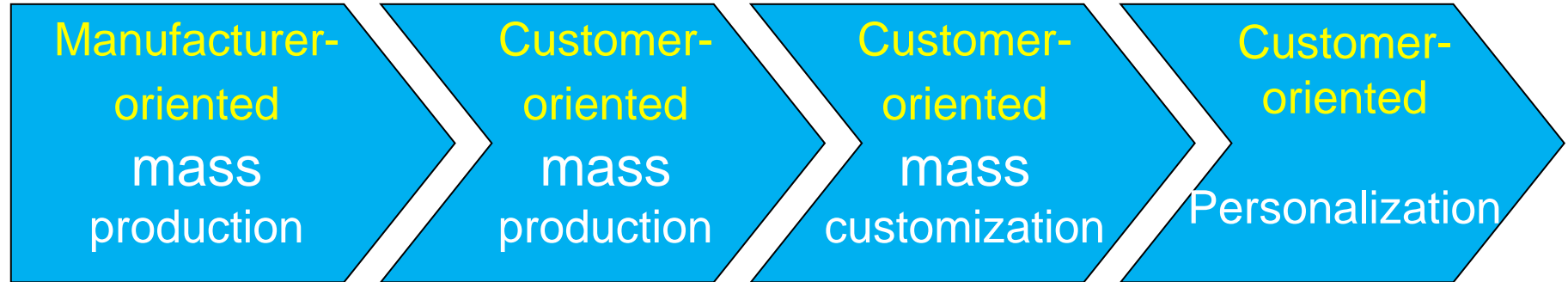
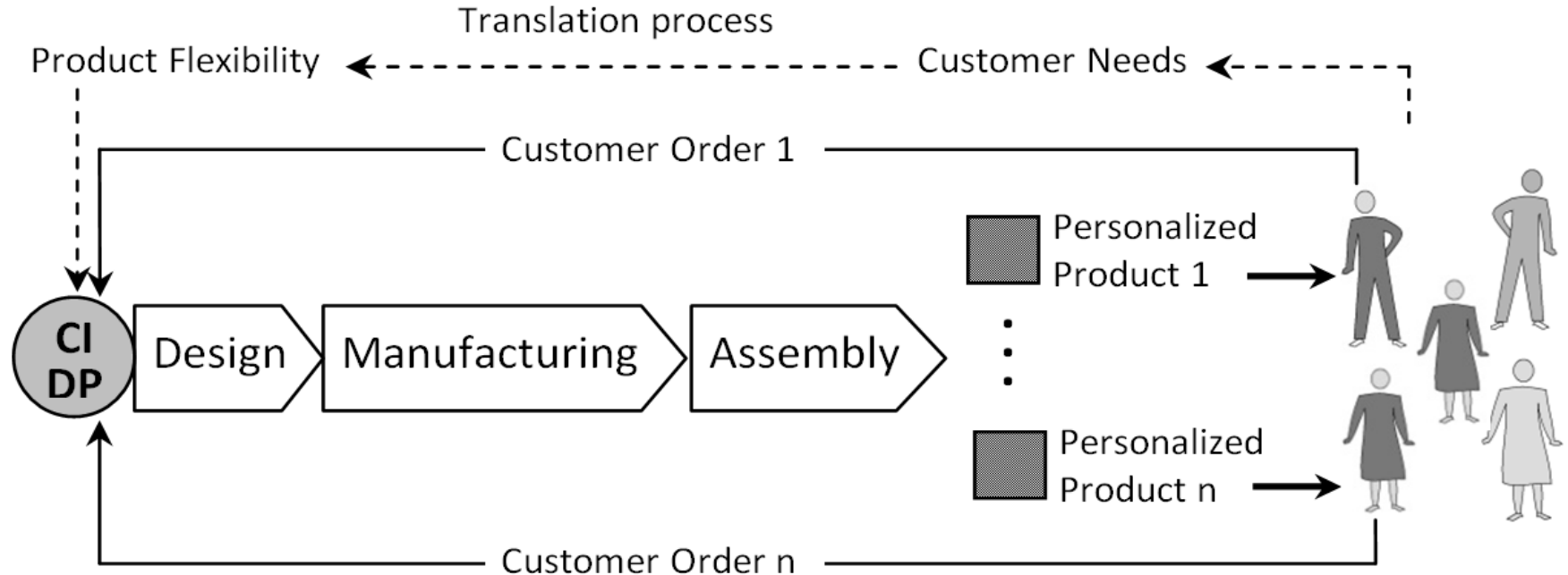


Fig. 2. Role of end-users in co-creation-based NPD process.

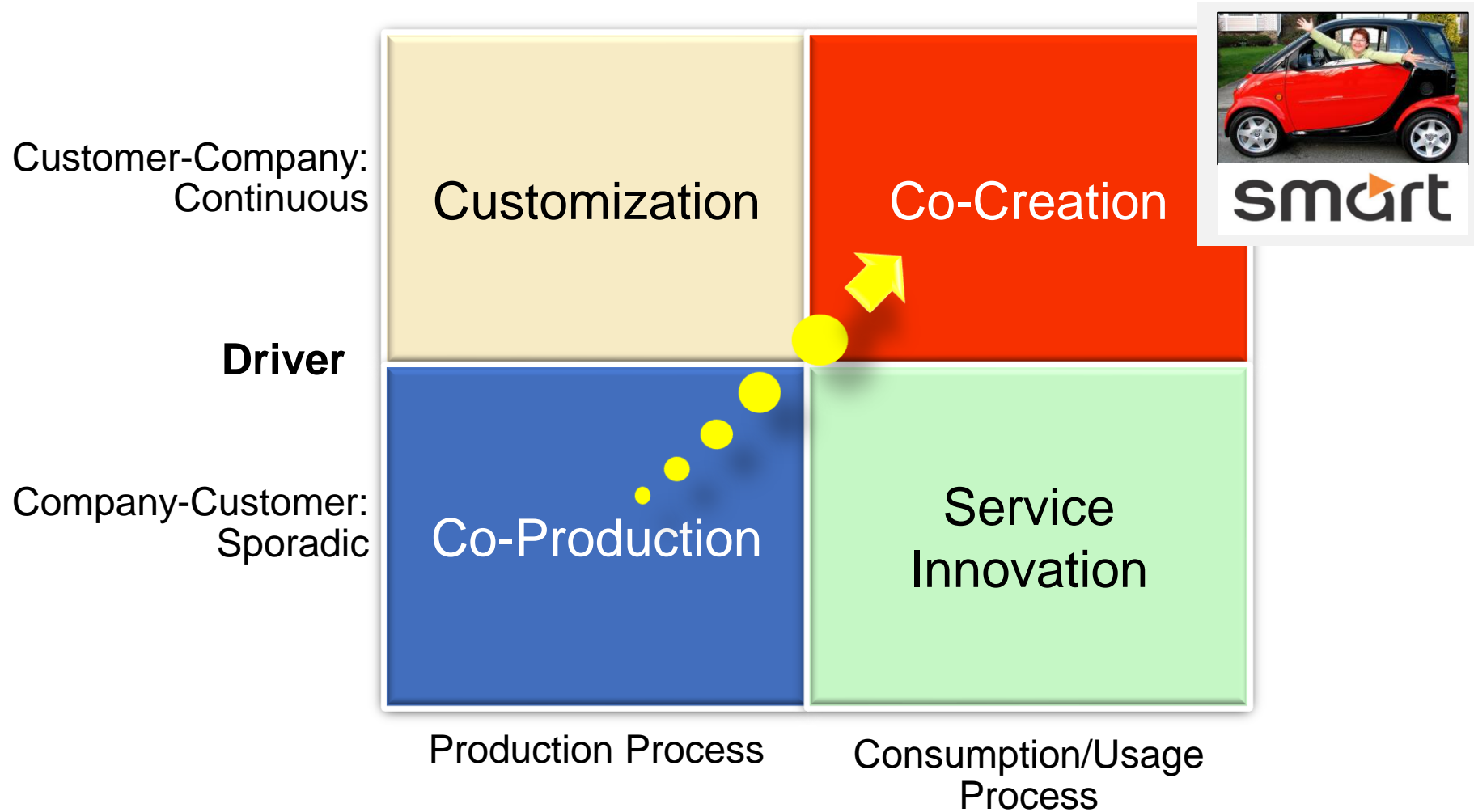




Customer Involvement



Co-Production to Co-Creation matrix



Completion of Value

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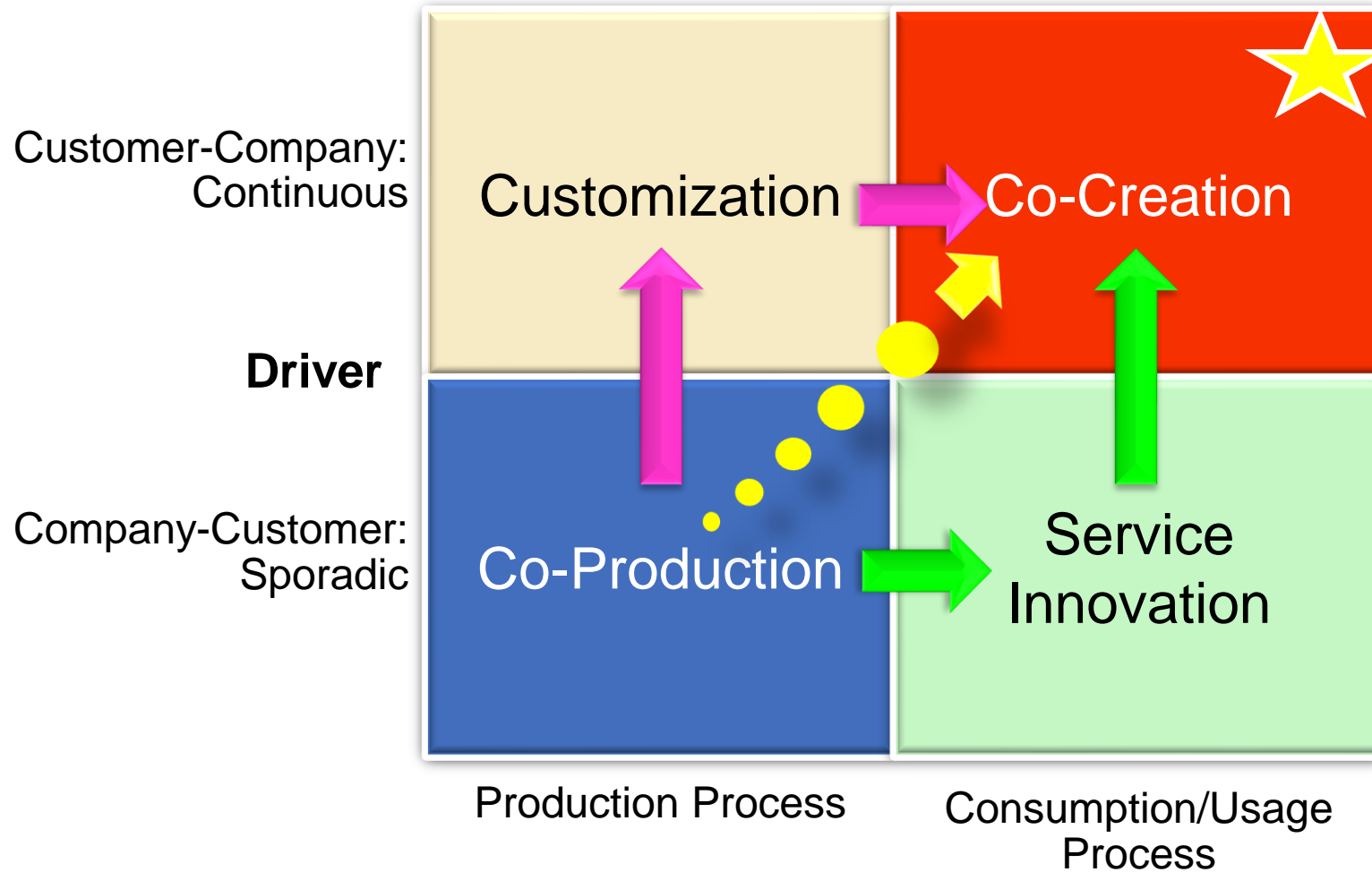
Co-creation

Co-production

Customers' expectation	Co-create products and services with customer	Suit their needs to what available
Focus	Customer and experience centric	Production and company centric
Customers' role	Active	Passive
Innovation	Co-innovate and co-design with customer	Led by the company



Co-Production to Co-Creation matrix



Completion of Value

Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. (2013). Co-production versus co-creation: A process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32, 11-20.

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Co-Production to Co-Creation matrix

You can give your ideas



Private

All we do together with you



Thesis



We prepare for you

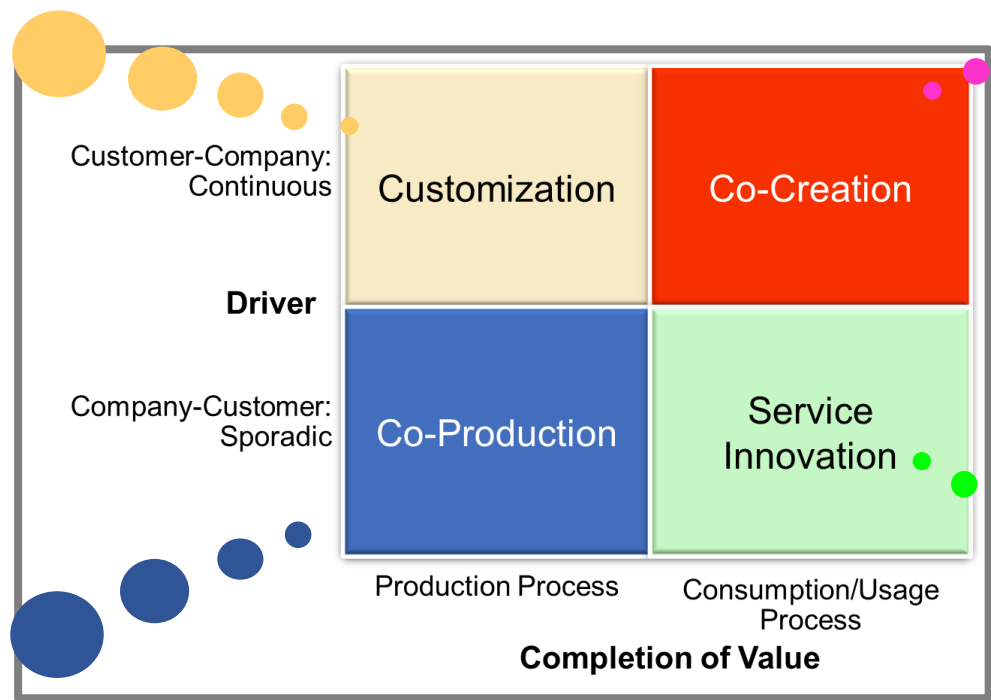


Online

We design for you



Classroom



Steps for Achieving Higher Levels of Co-Creation



1

Assess if firm
is capable of
co-creation

2

Assess the
potential for
co-creation

3

Assess the
right method
for co-
creation

4

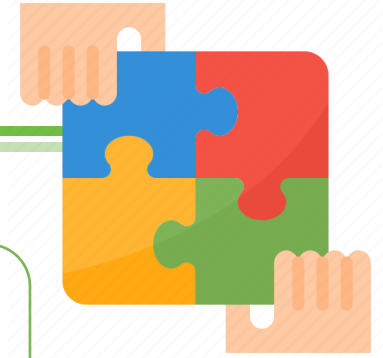
Assess the
level of co-
creation

5

Develop
methods to
increase
degree of co-
creation



3 Important Characteristics for Co-Creation



Nice-to-have: If a firm has these characteristics, it will be an advantage for the firm, but not having them will not result in any difficulty during co-creation.

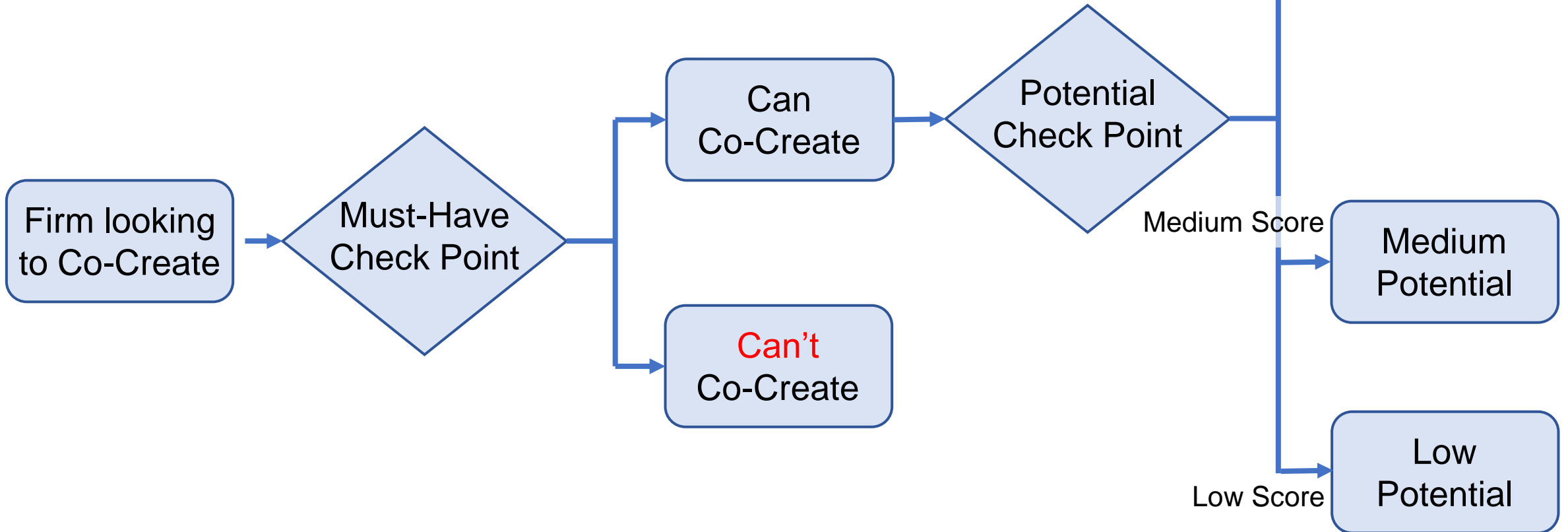
Should-have: A firm should have these characteristics if the firm wants to co-create. Otherwise, it will be difficult for the firm to co-create, but still the firm will be able to co-create.

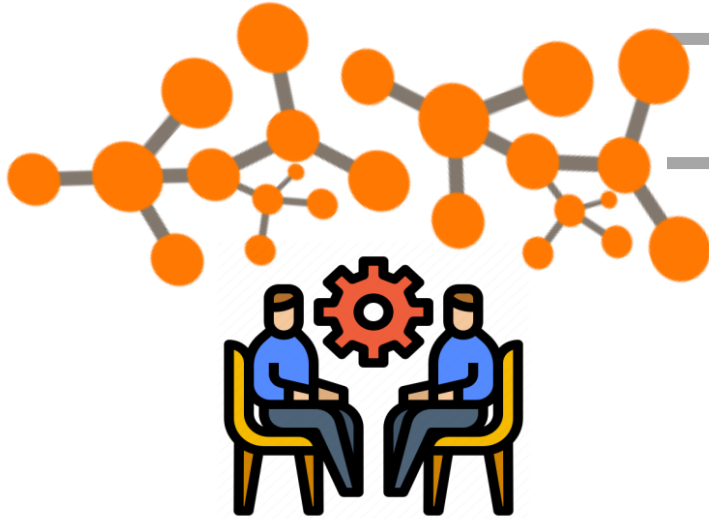
Must-have: A firm must have these characteristics if the firm wants to co-create. Otherwise, the firm cannot co-create.





Framework to Measure Potential for Co-Creation





17 Characteristics

To investigate firm readiness and potential for co-creation, 17 characteristics reported in the literature were identified. These characteristics are not related to firms' technical or operational capabilities, but they are **focused on the managerial approaches and mindset of the firms** instead. Therefore, they are equally applicable to all the industrial sectors and product categories.

1. Two-way communication channel
2. Staff training in customer relation
3. Manufacturing personalized items
4. Firm willingness
5. Effective information-sharing
6. Effective management of the new content
7. Mass customization experience
8. Communication among end-users
9. Exploitation
10. Current market share
11. Satisfaction level
12. Multiple communication channels
13. Screening system
14. Effective information management system (IMS)
15. Openness to ideas
16. R&D activities
17. Flexibility



Table 1. Criteria for importance levels.

Criteria	Importance level
85% or above	Must-have
51% or above but below 85%	Should-have
34% or above but below 51%	Nice-to-have
Below 34%	Not-related

Weighted Score for Each Characteristic

$$W_i = \frac{\sum_{j=1}^4 w_j X_{ij}}{w_{\max} \sum_{j=1}^4 X_{ij}} \times 100\%,$$

$$W_{cj} = \frac{w_j}{w_{\max}} \times 85\%,$$



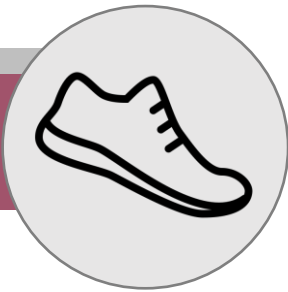
Table 6. Summary of results from all calculations.

Characteristics	Must-have	Should-have	Nice-to-have	Not-related	Total replies	Maximum possible score	Total obtained score	Weightage ratio	Importance level
Willingness	24	4	0	0	28	140	132	94.3%	Must-have
Openness to idea	21	5	1	0	27	135	122	90.4%	
Effective information sharing	19	7	2	0	28	140	120	85.7%	Should-have
Flexibility	17	10	1	0	28	140	117	83.6%	
Two-way communication channel	17	10	1	0	28	140	117	83.6%	
Screening system	17	8	1	1	27	135	111	82.2%	
R&D activities	17	6	4	0	27	135	111	82.2%	Nice-to-have
Staff training in customer relation	16	10	2	0	28	140	114	81.4%	
Manage customer contribution	15	10	3	0	28	140	111	79.3%	
Effective IMS	11	12	5	0	28	140	101	72.1%	
Exploitation	8	17	2	1	28	140	95	67.9%	
Communication among end-users	9	12	5	2	28	140	91	65.0%	
Multiple communication channels	7	14	6	1	28	140	89	63.6%	Not-related
Manufacturing personalized items	5	5	13	5	28	140	66	47.1%	
High satisfaction level	1	10	9	8	28	140	53	37.9%	Not-related
Mass customization experience	1	6	12	9	28	140	47	33.6%	
Large market share	4	2	9	13	28	140	44	31.4%	



Firm A, is well known for its sports shoe wear and worldwide market leader in manufacturing and distribution of football shoes.

Case Study



Firm B is well known for its low-cost and high-quality shoes. This firm is famous for the manufacturing and distribution of formal shoes and is a market leader in the category of school shoes for kids.



Firm C is known for its luxurious and comfortable leather shoes. This firm is one of the market leaders in leather shoes manufacturing and distribution in Europe.



Case Study

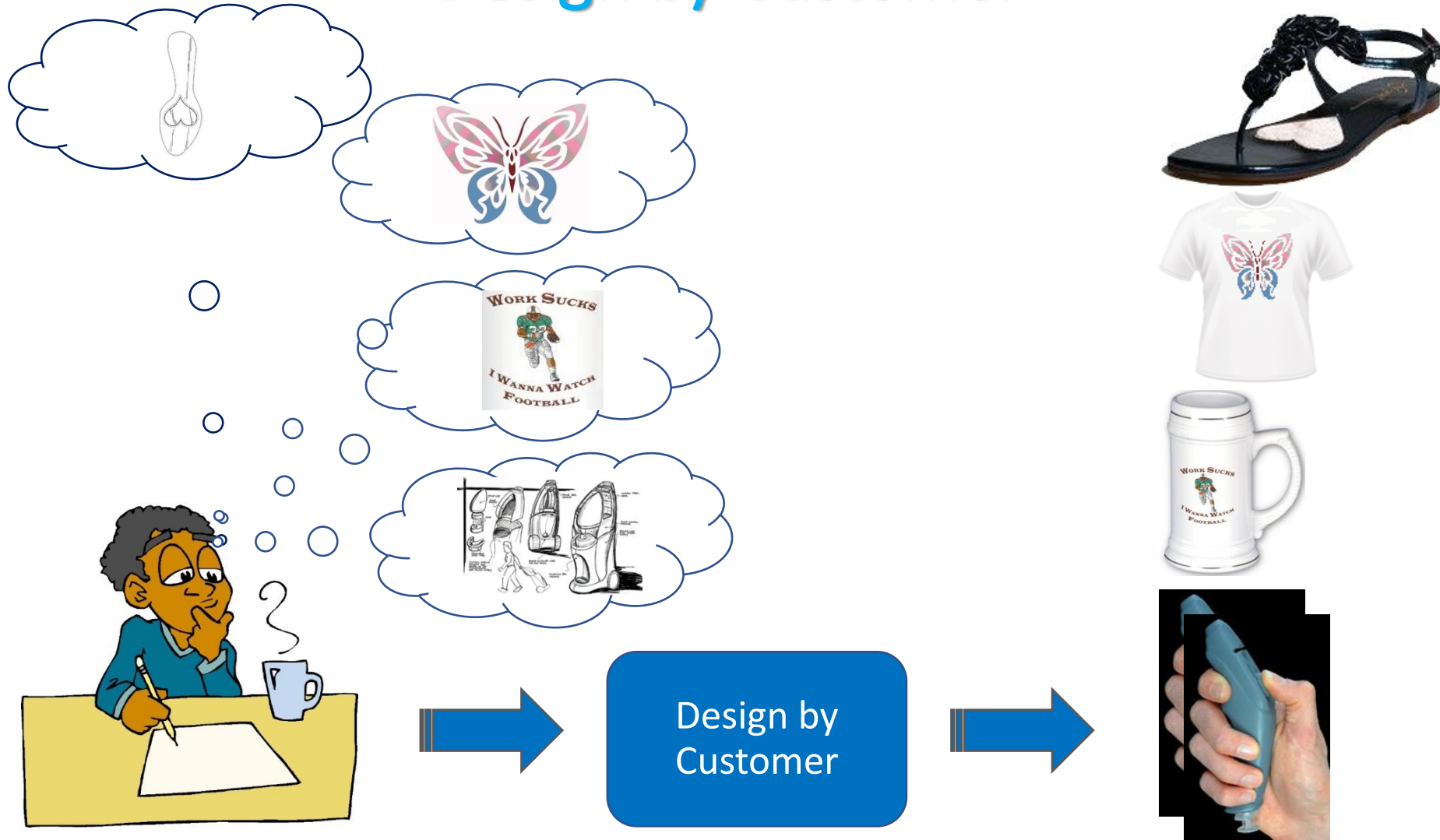


Table 7. Summary of potential score calculations for three shoe manufacturers.

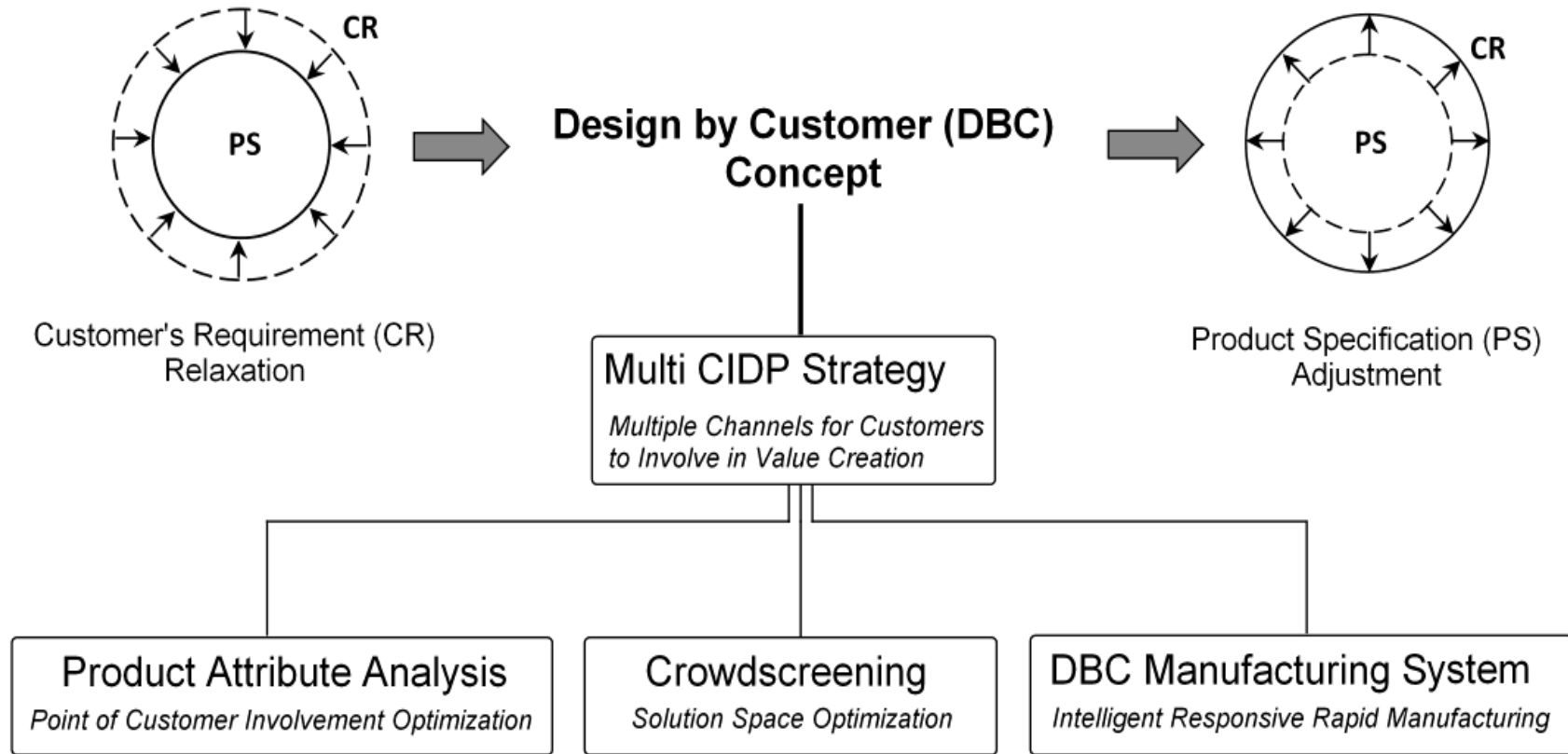
Characteristics	Weight	Firm A		Firm B		Firm C	
		Rating	Potential score	Rating	Potential score	Rating	Potential score
Flexibility	3	1	3	0	0	1	3
Two-way communication channel	3	0	0	0	0	0	0
Staff training in customer relation	3	1	3	1	3	1	3
Screening system	3	1	3	0	0	0	0
R&D activities	3	1	3	1	3	1	3
Manage customer contribution	3	1	3	0	0	0	0
Effective IMs	3	1	3	1	3	1	3
Exploitation	3	1	3	1	3	1	3
Communication among end-users	3	0	0	0	0	0	0
Multiple communication channel	3	0	0	0	0	0	0
Manufacturing personalized items	2	1	2	1	2	1	2
High satisfaction level	2	1	2	1	2	1	2
Mass customization experience	2	1	2	0	0	0	0
Potential score			27		16		19
Percentage			81%		48%		57%
Result			High potential		Low potential		Medium potential

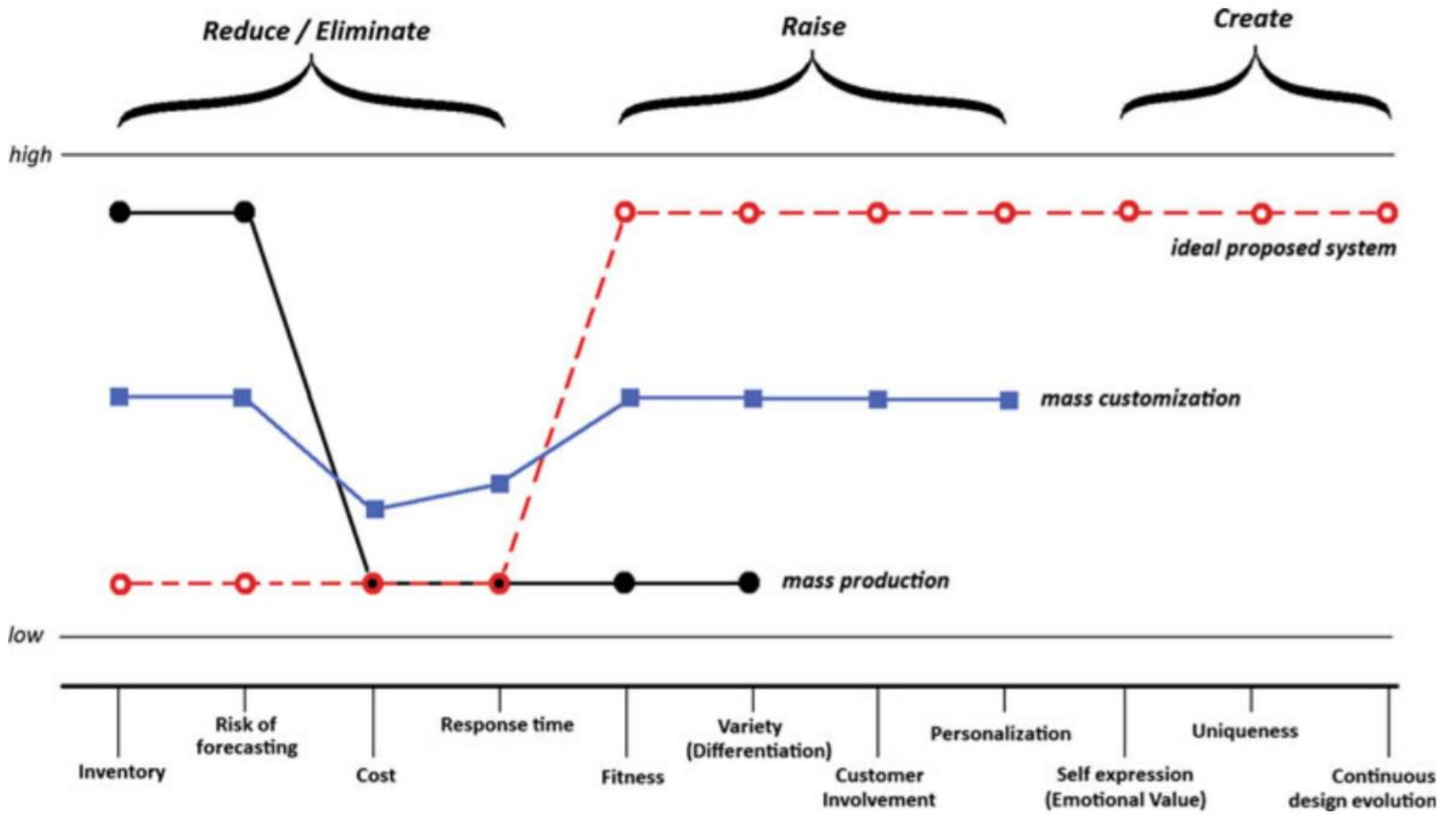


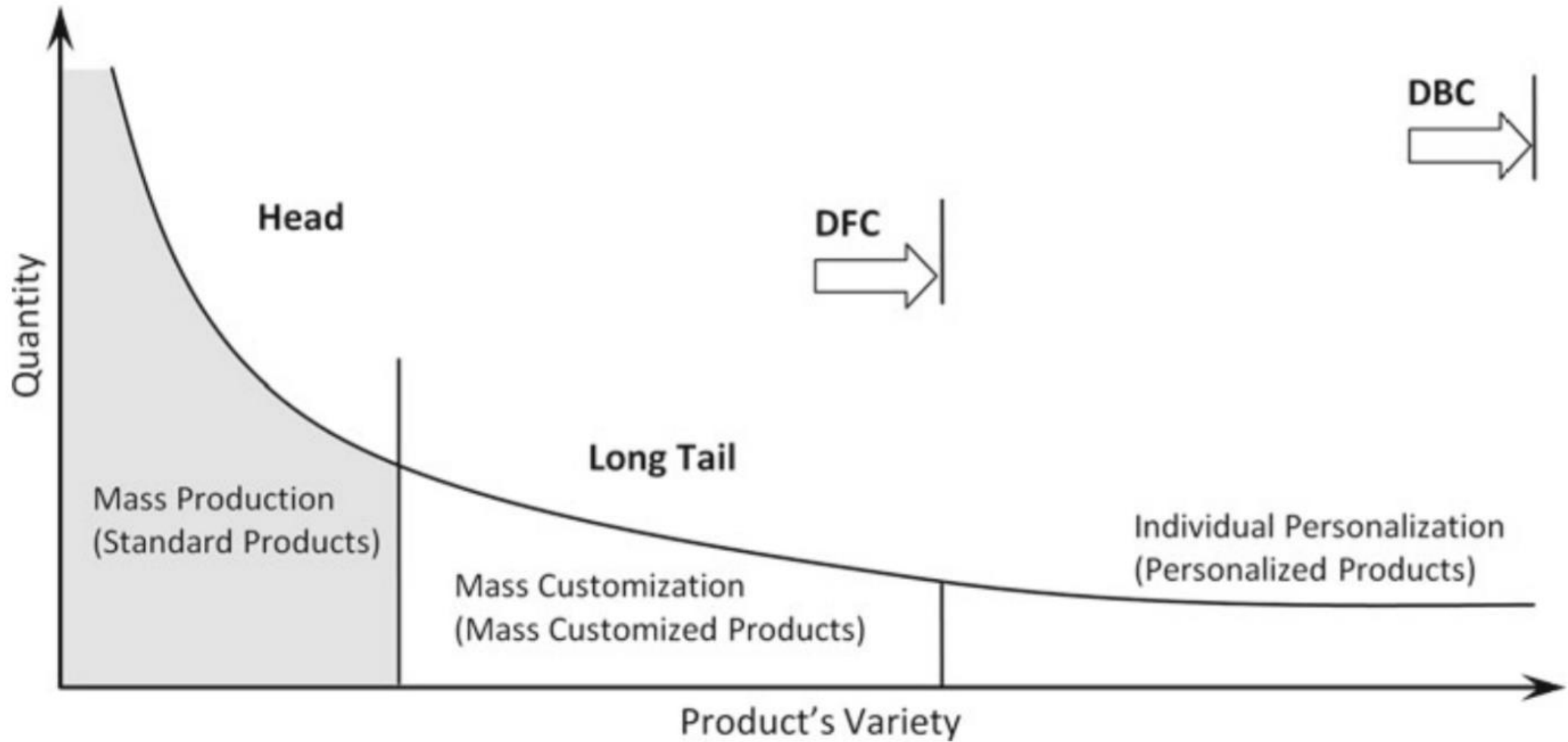
Design by Customer



Design by Customer









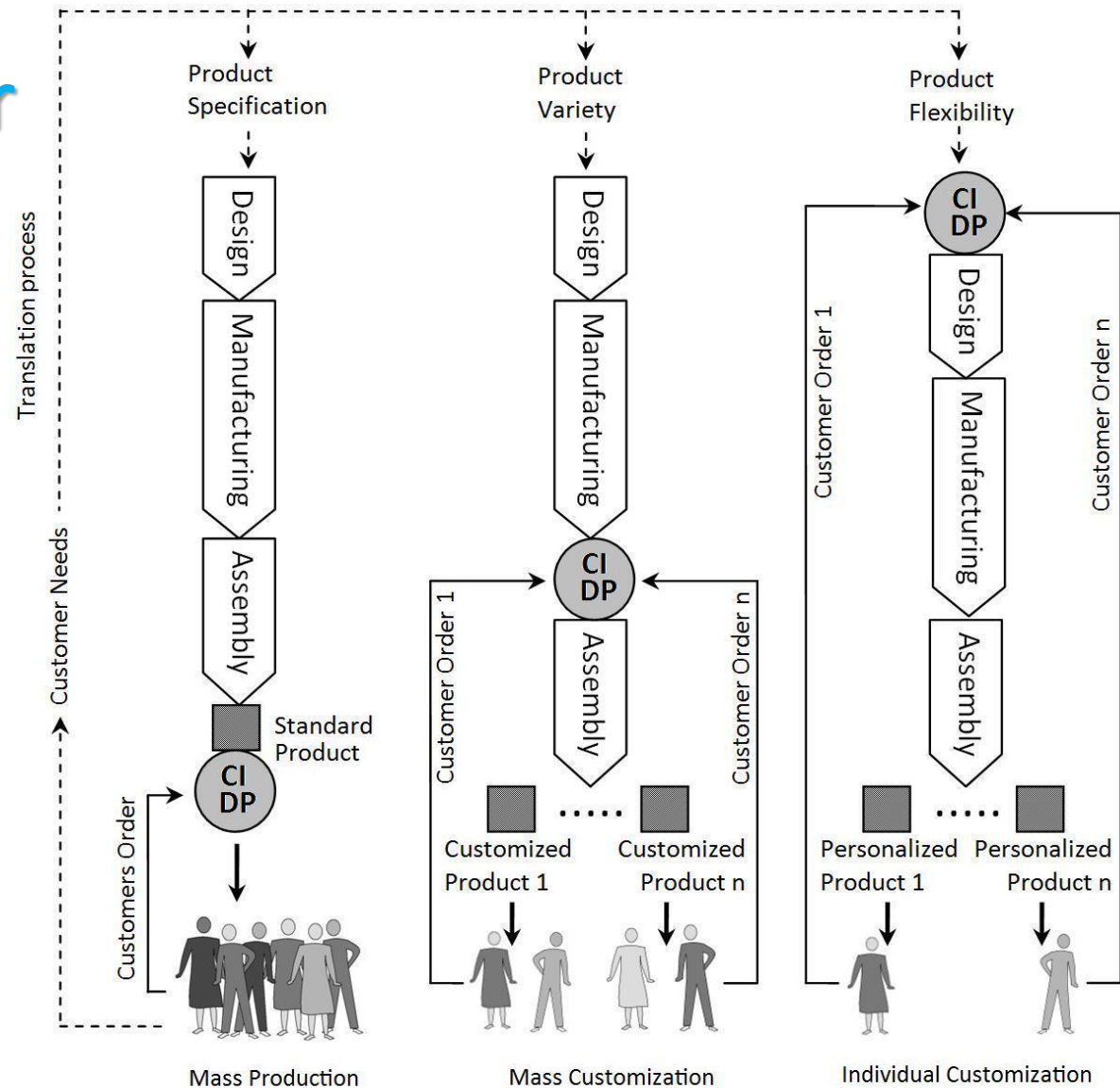
Design by Customer

DBC:

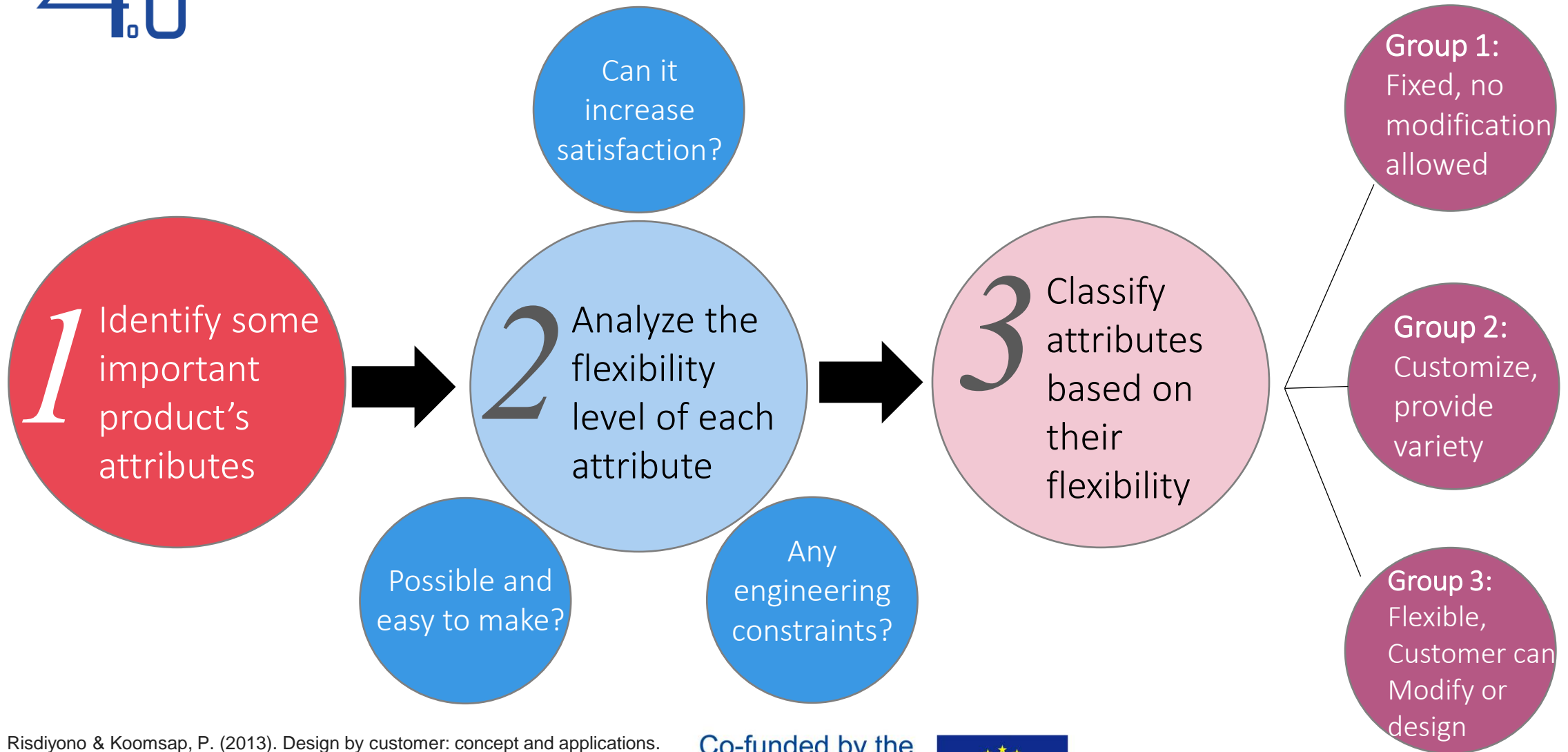
Multi CIDP

Customers can flexibly involve in any stages

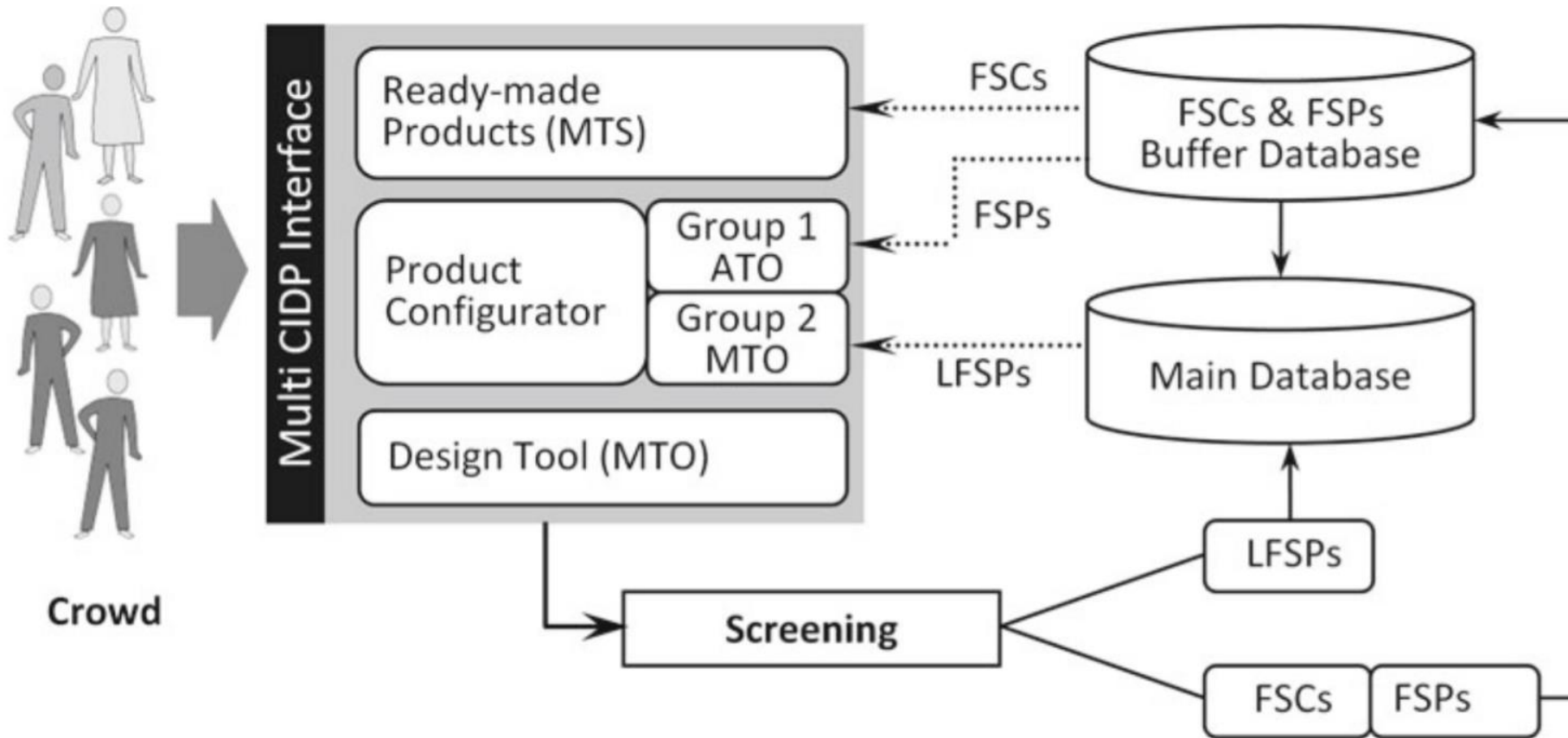
- Select
- Combine
- Modify
- Design



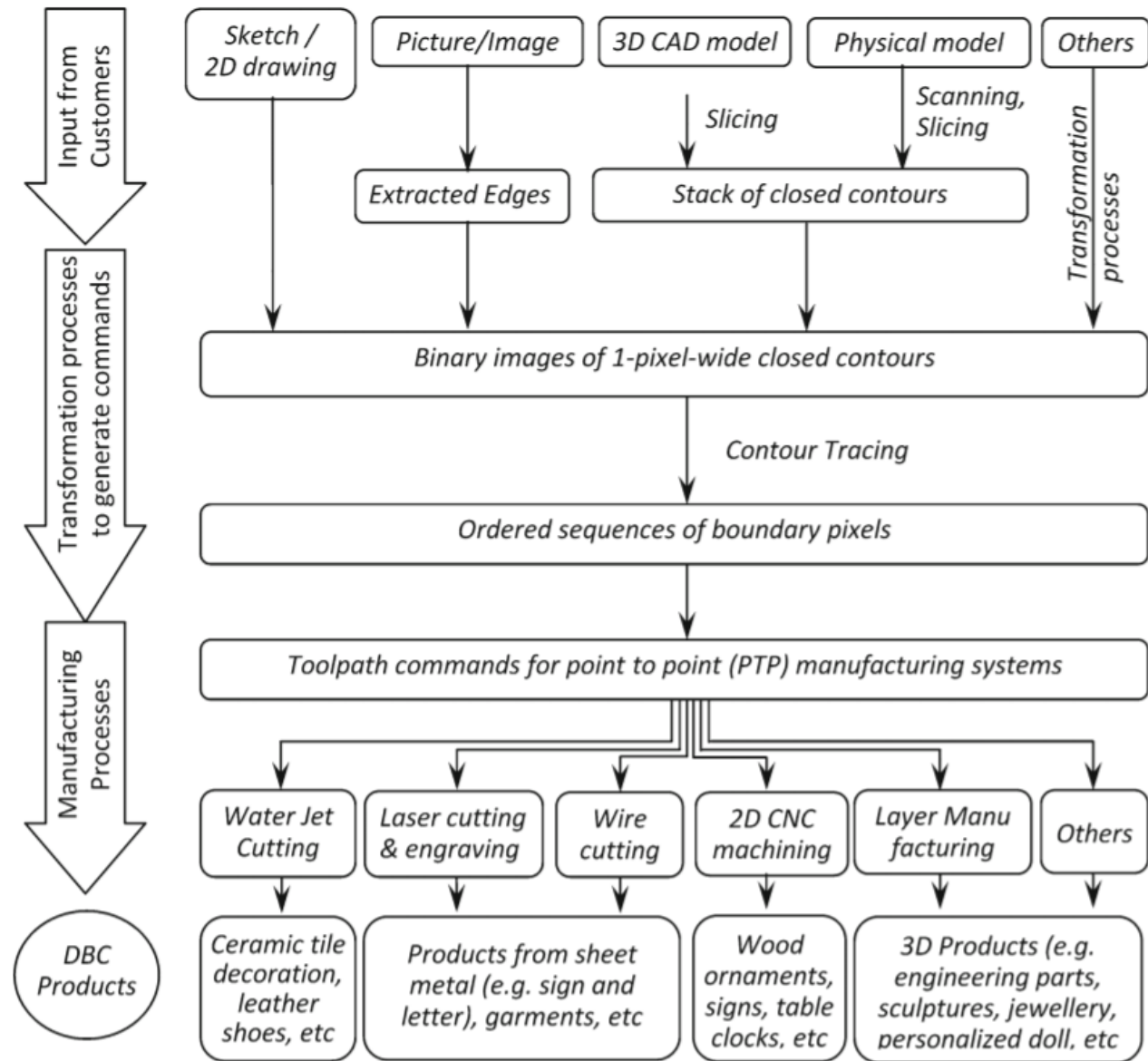
The general processes of the product attribute analysis



Crowdsourcing Process



General platform for DBC manufacturing system, especially for visual design

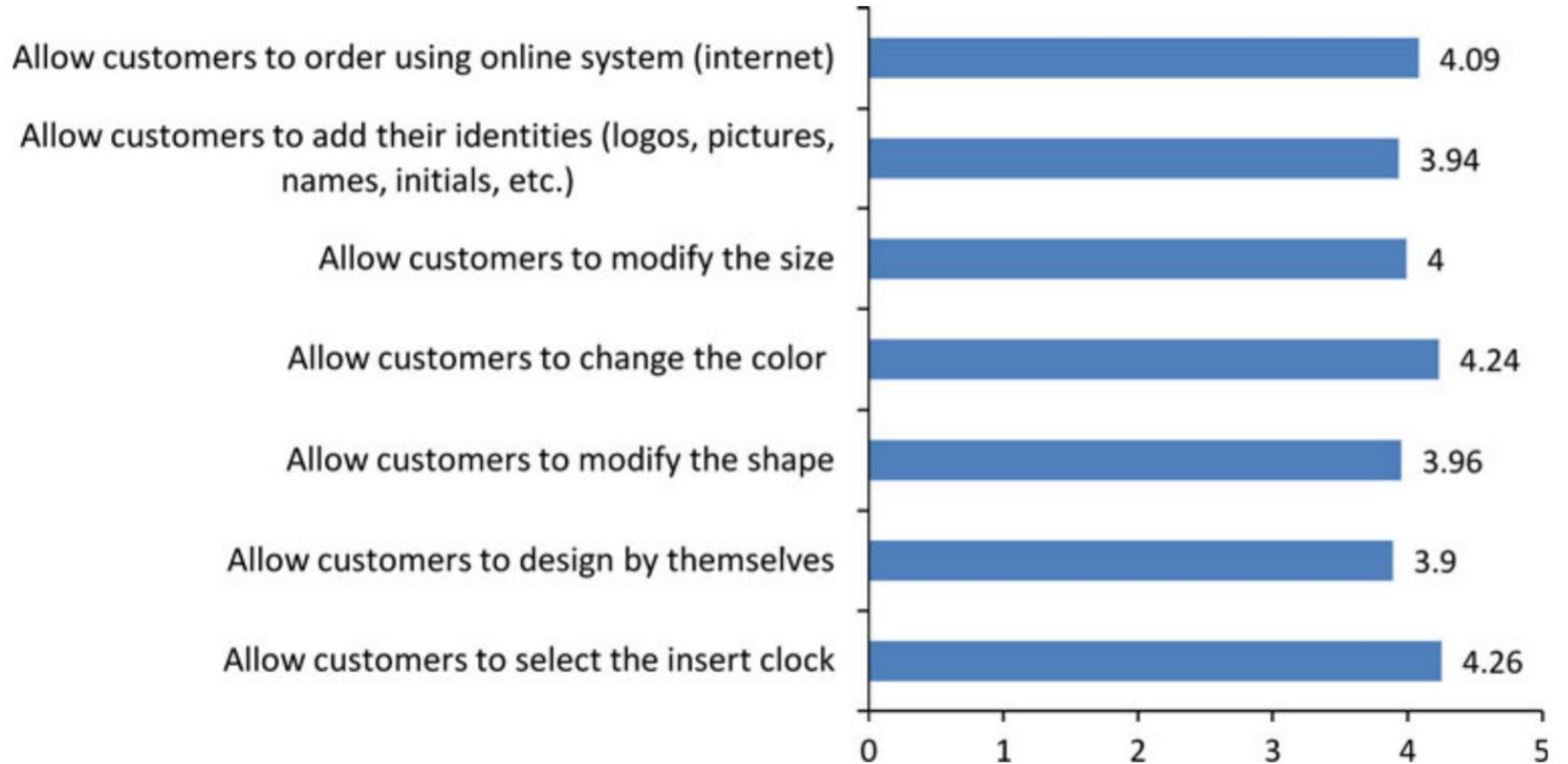


Design by Customer

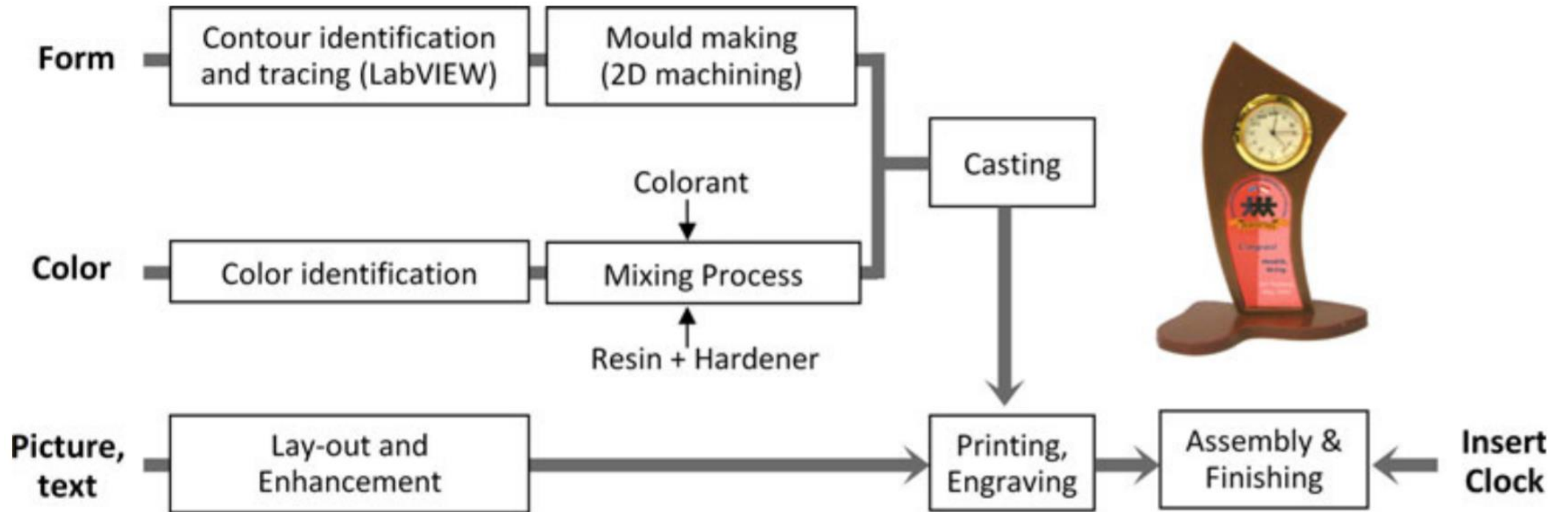


Table clock and its main parts

Attractiveness level of product flexibility






Production processes of DBC table clock



Multi CIDP user interface



Table 1 Product's attribute analysis of table clock product

Part	Attribute	Product's Attributes Analysis			Flexibility level
		Is modifying attribute attractive to customers?	Is it possible and easy to make?	Any engineering constraints?	
	Form (shape and size)	yes	yes	no	Group 3
	Colour	yes	yes	no	Group 3
	Size of hole	yes	yes	yes	Group 1
	Additional text and picture	yes	yes	no	Group 3
	Form (shape and size)	yes	yes	no	Group 3
	Colour	yes	yes	no	Group 3
	Type (case, bezel, dial, hands, colour movement)	yes	no	yes	Group 2

Group 1 : the attributes are fixed, no modification is allowed

Group 2 : varieties are provided, customers can only select

Group 3 : varieties are provided, customers can either select, modify or design

Initial solution space for table clock customization























































Ready-made Products	 $B_6C_3-S_3C_1-I_2$	 $B_6C_1-S_3C_1-I_2$	 $B_2C_{11}-S_3C_{11}-I_7$	 $B_2C_9-S_3C_9-I_2$	 $B_{10}C_4-S_3C_1-I_9$	 $B_{10}C_1-S_3C_4-I_5$						
Variety of Body	 B_1	 B_2	 B_3	 B_4	 B_5	 B_6						
	 B_7	 B_8	 B_9	 B_{10}	 B_{11}	 B_{12}						
Supports	 S_1	 S_2	 S_3	 S_4	 S_5	 S_6						
	 S_7	 S_8	 S_9	 S_{10}	 S_{11}	 S_{12}						
Colors	 C_1	 C_2	 C_3	 C_4	 C_5	 C_6	 C_7	 C_8	 C_9	 C_{10}	 C_{11}	 C_{12}
Insert Clocks	 I_1	 I_2	 I_3	 I_4	 I_5	 I_6	 I_7	 I_8	 I_9	 I_{10}		
Design Tool												

Table 2 Data of customer selection at the first round of crowdsourcing process

No.	Ready-made Products		Product Configurator (Mass Customization)										New designs from customers
			FSCs		FSPs								
	Configurations	<i>n</i>	Configurations	<i>n</i>	Body	<i>n</i>	Support	<i>n</i>	Colour	<i>n</i>	Insert Clock	<i>n</i>	
1	B ₆ C ₃ -S ₁ C ₃ -I ₂	8	B ₆ C ₁₁ -S ₁ C ₁₁ -I ₈	12	B ₆	67	S ₁	60	C ₁₁	59	I ₈	53	
2	B ₂ C ₁₁ -S ₃ C ₁₁ -I ₇	6	B ₃ C ₁ -S ₁₁ C ₁₀ -I ₃	9	B ₃	61	S ₄	50	C ₃	53	I ₃	48	
3	B ₆ C ₁ -S ₁ C ₁ -I ₂	6	B ₆ C ₃ -S ₁ C ₃ -I ₂	9	B ₄	58	S ₁₁	47	C ₁	47	I ₆	43	
4	B ₁₀ C ₄ -S ₅ C ₁ -I ₉	5	B ₄ C ₈ -S ₁₀ C ₈ -I ₆	8	B ₇	39	S ₅	42	C ₈	44	I ₁	38	
5	B ₁₀ C ₁ -S ₅ C ₄ -I ₅	2	B ₇ C ₄ -S ₅ C ₁ -I ₈	7	B ₂	29	S ₁₀	34	C ₇	39	I ₂	34	
6	B ₂ C ₉ -S ₃ C ₉ -I ₂	1	B ₂ C ₁₁ -S ₄ C ₁₁ -I ₃	7	B ₁₀	18	S ₆	24	C ₂	28	I ₉	30	
7			B ₁₀ C ₁ -S ₅ C ₁₀ -I ₁	5	B ₁₂	14	S ₉	18	C ₅	19	I ₁₀	25	
8			B ₁₂ C ₇ -S ₁₁ C ₇ -I ₁	5	B ₉	13	S ₈	17	C ₉	14	I ₇	21	
		28	Others	277	Others	40	Others	47	Others	36	Others	47	
	Total = 28 (7.6%)		Total = 339 (91.6%)										Total = 3 (0.8%)

n = number of product configurations defined by respondents

New primary solution space after the first round of crowdsourcing process

Ready-made Products	<p> $B_6C_3-S_1C_3-I_2$ $B_3C_1-S_{11}C_{10}-I_3$ $B_6C_{11}-S_1C_{11}-I_8$ $B_4C_8-S_{10}C_8-I_6$ $B_7C_4-S_5C_1-I_8$ $B_2C_{11}-S_3C_{11}-I_7$ </p>
Product Configurator (Mass Customization)	Variety of Body <p>B_6 B_3 B_4 B_7 B_2 B_{10}</p>
	Supports <p>S_1 S_4 S_{11} S_5 S_{10} S_6</p>
	Colors <p>C_1 C_2 C_3 C_4 C_5 C_6 C_7 C_8 C_9 C_{10} C_{11} C_{12}</p>
	Insert Clocks <p>I_1 I_2 I_3 I_4 I_5 I_6 I_7 I_8 I_9 I_{10}</p>
Design Tool	<p> 1. Create a Closed Contour 2. Extrude Contour for Thickness 3. Colour the Model </p>



Examples of finished DBC products





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Thank You

Together We Will Make Our Education Stronger



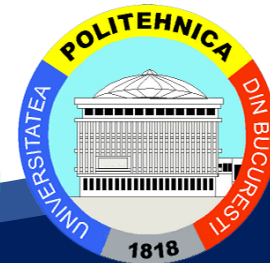
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