BUSINESS TRIZ ONLINE
WINTER 2021

Using Business TRIZ Method to Improve the Speed of Checkout Process of Convenience Stores
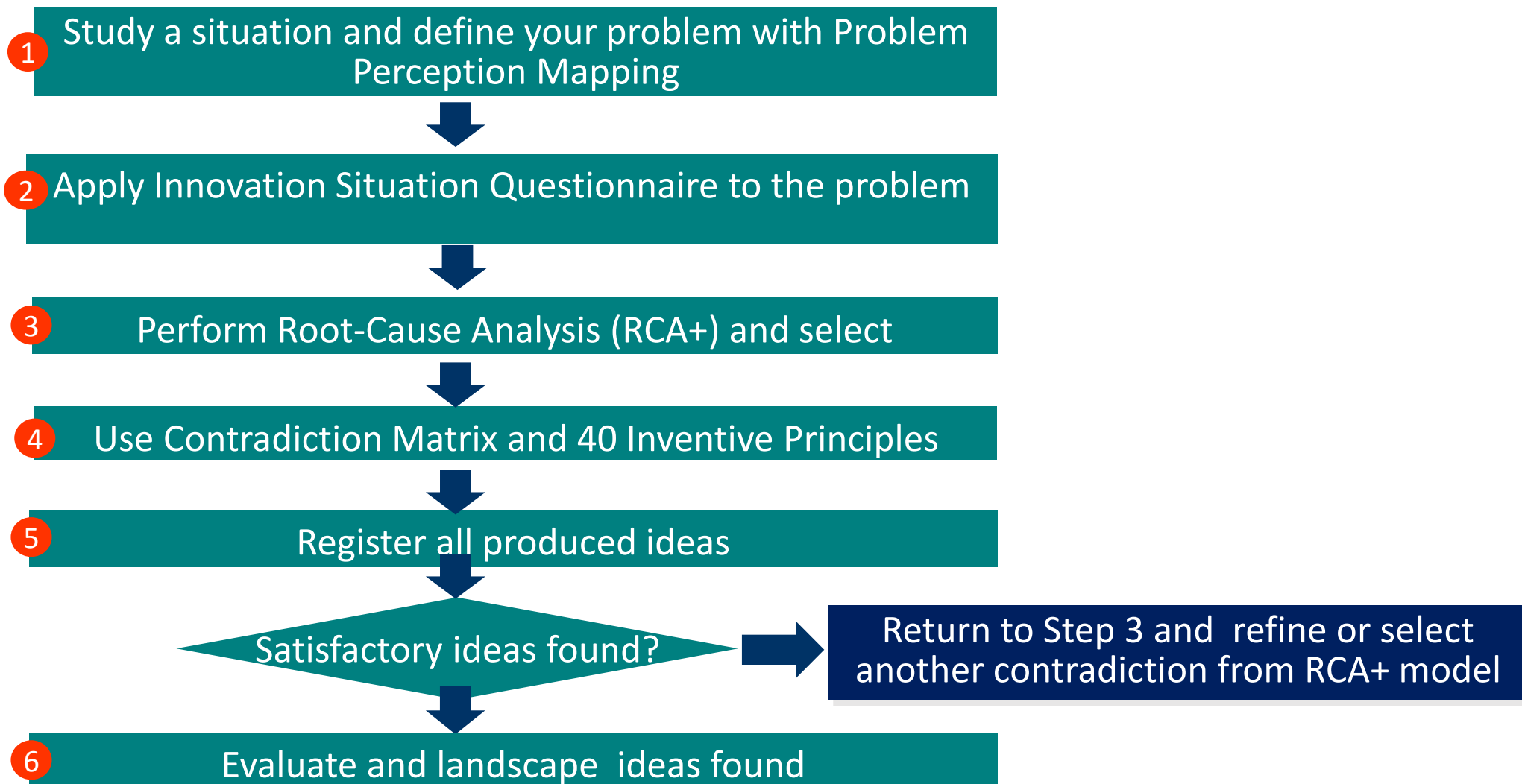
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TRIZ Problem Solving Process : Simplified version

1. Study a situation and define your problem with Problem Perception Mapping

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2. Apply Innovation Situation Questionnaire to the problem

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3. Perform Root-Cause Analysis (RCA+) and select

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4. Use Contradiction Matrix and 40 Inventive Principles

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5. Register all produced ideas

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Satisfactory ideas found? → Return to Step 3 and refine or select another contradiction from RCA+ model

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6. Evaluate and landscape ideas found

Step 1: Problem Perception Mapping

- Problem Description:

  7-11's checkout is too slow, then customers are dissatisfied and lost.

- What causes the problem

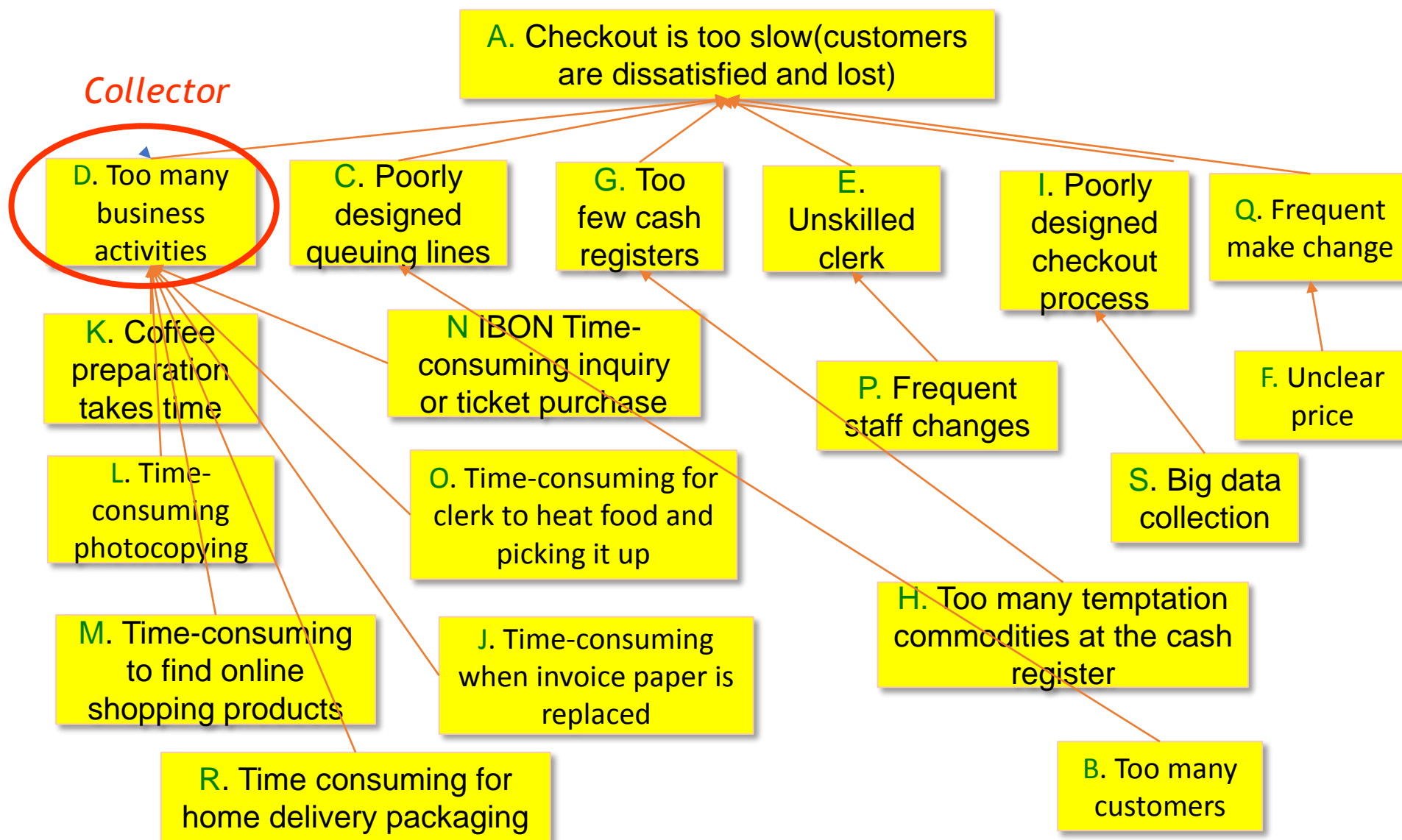|			
Big data collection	Unclear price	Unskilled clerk	Too many customers
Frequent staff changes	Too many business activities	Checkout is too slow	Poorly designed checkout process
Frequent make change	Too few cash registers	Poorly designed queuing lines	Time-consuming photocopying
Coffee preparation takes time	Time-consuming when invoice paper is replaced	Time-consuming for clerk to heat food and picking it up	Too many temptation commodities at the cash register
Time-consuming for home delivery packaging	Time-consuming to find online shopping products	IBON Time-consuming inquiry or ticket purchase	

The Lead-to Table

ID	Perception	Lead To	
A	Checkout is too slow (customers are dissatisfied and lost)		
B	Too many customers	C	
C	Poorly designed queuing lines	A	
D	Too many business activities	A	
E	Unskilled clerk	A	
F	Unclear price	Q	
G	Too few cash registers	A	
H	Too many temptation commodities at the cash register	C	
I	Poorly designed checkout process	A	
J	Time-consuming when invoice paper is replaced	D	
K	Coffee preparation takes time	D	
L	Time-consuming photocopying	D	
M	Time-consuming to find online shopping products	D	
N	IBON Time-consuming inquiry or ticket purchase	D	
O	Time-consuming for clerk to heat food and picking it up	D	
P	Frequent staff changes	E	
Q	Frequent make change	A	
R	Time consuming for home delivery packaging	D	
S	Big data collection	I	
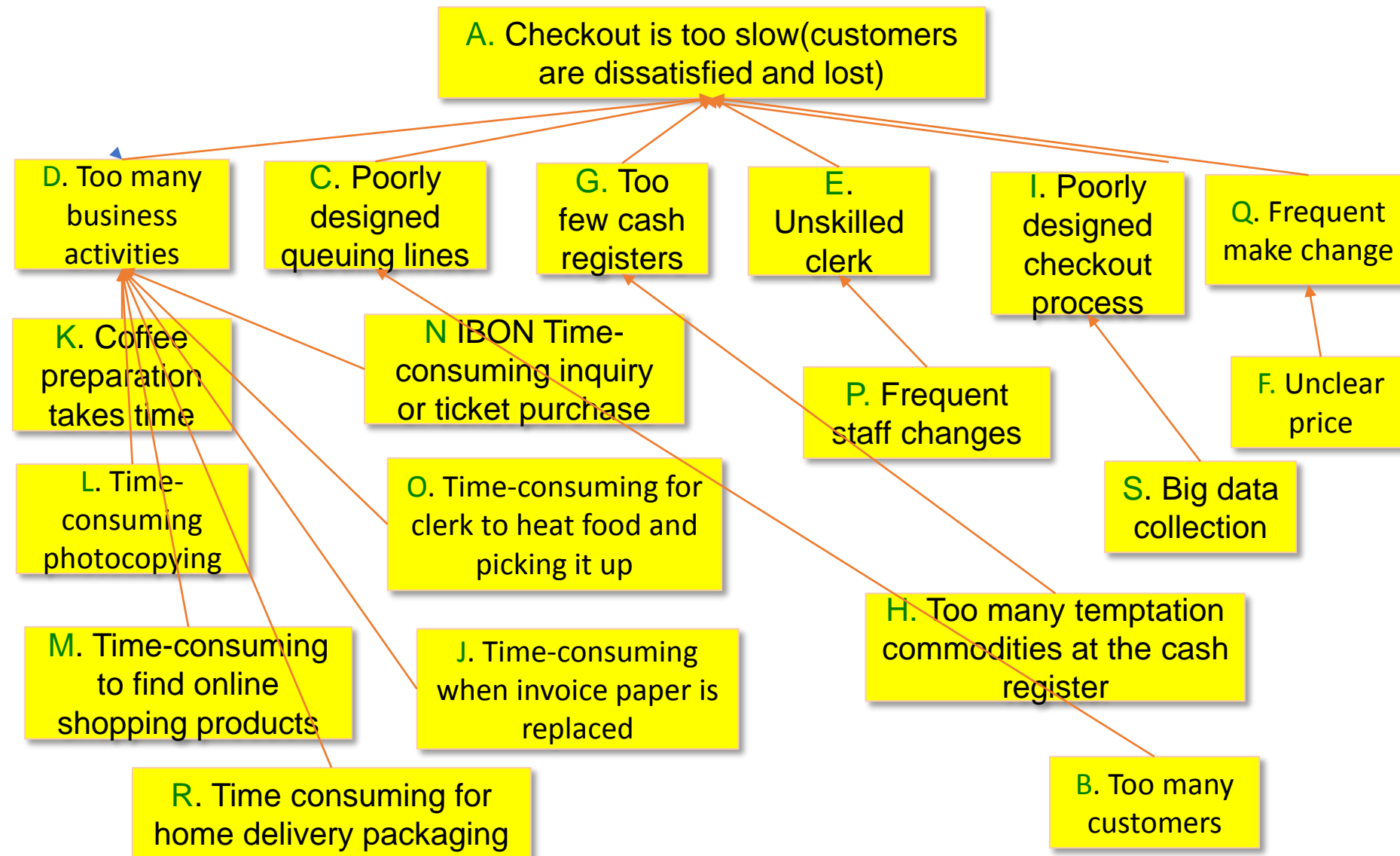
The Lead-to Fig.

The Lead-to Table

| ID	Perception	Lead To	Score
A	Checkout is too slow (customers are dissatisfied and lost)		5
B	Too many customers	C	0
C	Poorly designed queuing lines	A	1
D	Too many business activities	A	6
E	Unskilled clerk	A	0
F	Unclear price	Q	0
G	Too few cash registers	A	0
H	Too many temptation commodities at the cash register	C	0
I	Poorly designed checkout process	A	1
J	Time-consuming when invoice paper is replaced	D	0
K	Coffee preparation takes time	D	0
L	Time-consuming photocopying	D	0
M	Time-consuming to find online shopping products	D	0
N	IBON Time-consuming inquiry or ticket purchase	D	0
O	Time-consuming for clerk to heat food and picking it up	D	0
P	Frequent staff changes	E	0
Q	Frequent make change	A	0
R	Time consuming for home delivery packaging	D	0
S	Big data collection	I	0

The Lead-to Fig.

Step 2:Innovation Situation Questionnaire(ISQ)

QUESTION	ANSWER
1.Describe the existing innovative situation in free words:	7-11's checkout is too slow, then customers are dissatisfied and lost.
2.Describe a system (product) which has to be improved (limit it to those parts which can be changed by you):	1.Product, customer, clerk, process, moving line, business activities 2.Quick checkout
3.Describe a key problem and the goal of improvement:	Too many business activities
4.Present a list of principal demands and requirements to the future solution (5-10 requirements). Try to be as specific as possible:	1.10 seconds to complete the checkout. 2. Friendly service attitude
	3. The number of staff cannot be increased. 4. The revenue cannot be reduced
	5. The cost cannot be increased15%. 6. Increase customer satisfaction
5.Are there any known solutions to solve the problem/challenge presented? If yes, mention them and specify why each of them cannot be used in your situation:	1. Add a quick checkout counter 2. Off-peak specials 3. Self-service coffee discount 4. Maneuver to increase manpower
6.Are there any ideas on the improvement that have been proposed? Describe ideas which have been already obtained (if any). Specify against each idea why it can not be used:	1. Business simplification 2. Special business franchise store.

Step 3a: Root Conflict Analysis
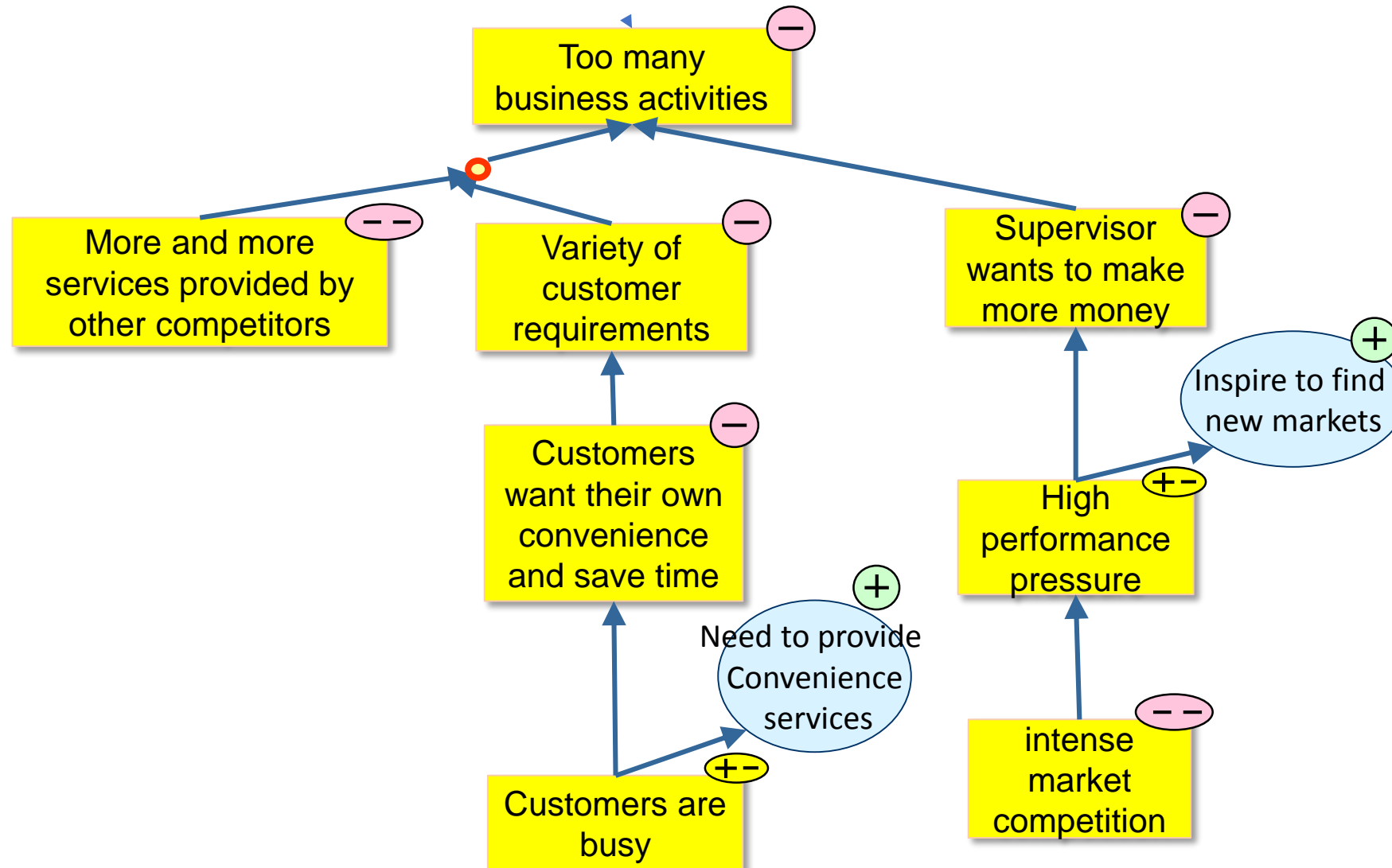
Step 3b: Ranking Contradictory Problems in Priority

- Ranking Contradictory Problems (Binary Problems Ranking)

No	Problems	1	2	SCORE
1	Customers are busy		+1	+1
2	High performance pressure	-1		-1

- Contradictory Problems Priority

No	Problems	SCORE
1	Customers are busy	+1
2	High performance pressure	-1

- ## Contradiction recognition

	Contradiction	Positive effect/Negative effect
1	Customers are busy	**Need to provide Convenience services /Customers want their own convenience and save time**
2	High performance pressure	**Inspire to find new markets /Supervisor wants to make any money**

Positive / Negative effect parameter

1.Activity Effectiveness. 2.Activity Variability. 3.Activity Expense. 4.Activity Time.
5.Activity Complexity. 6.Activity Convenience. 7.Activity Safety. 8. Activity Reliability.
9.System Effectiveness. 10. System Variability. 11.System Variability. 12. System Time.
13.System Complexity. 14. System Convenience. 15. System Safety. 16.System Reliability.
17.System Reliability. 18.External Risk .
19.External Risk . 20.External Risk . 21. Information Flow.
22. Feedback. 23.Material Flow.
24. Harmful Effects to System. 25. Harmful Effects from System.
26.Adaptability /Versatility.
27.Organizational Tension. 28.Organizational Stability.
29.Customer tension. 30.Customer Stability.
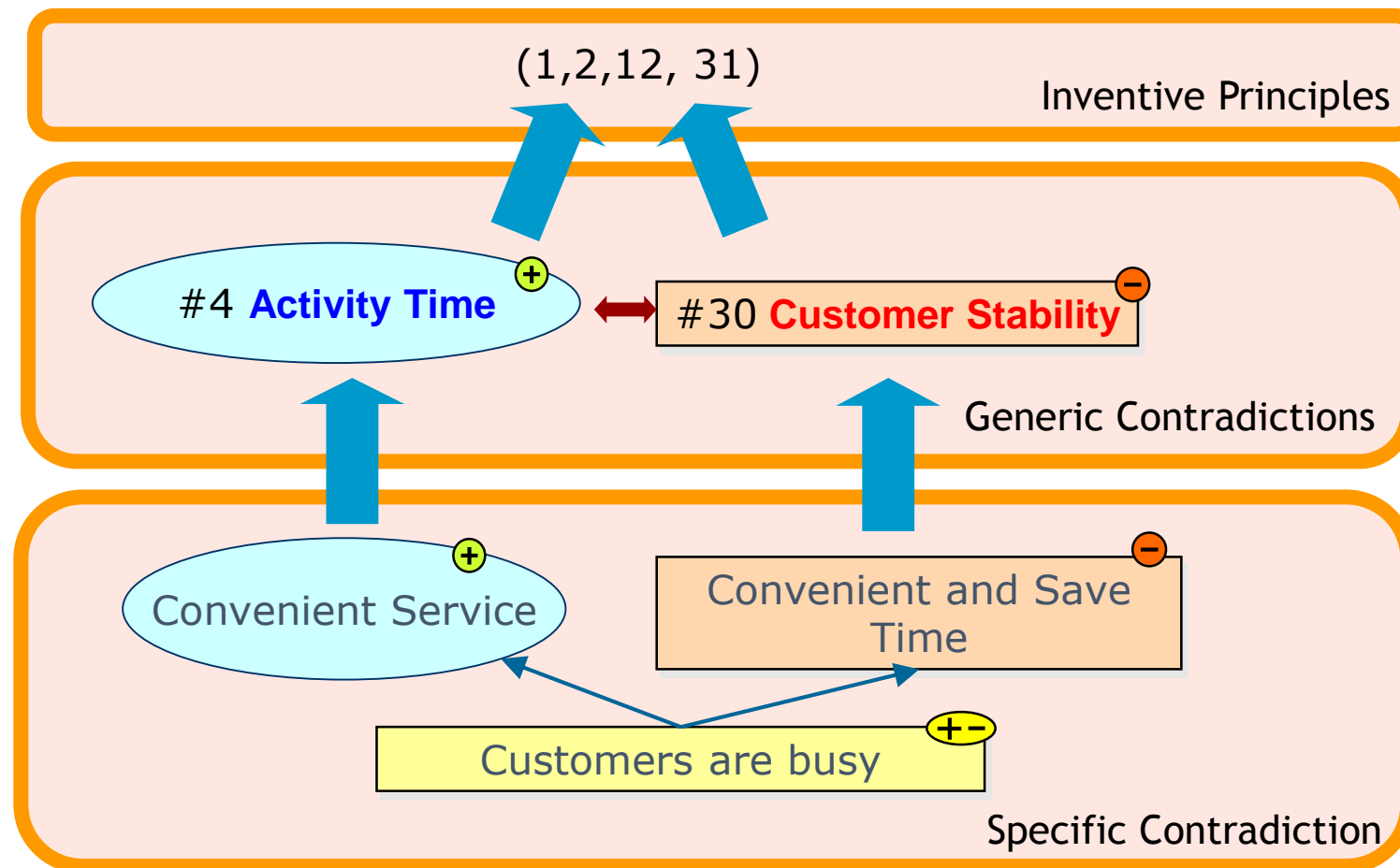31. Environment Stability.

Contradiction parameter recognition

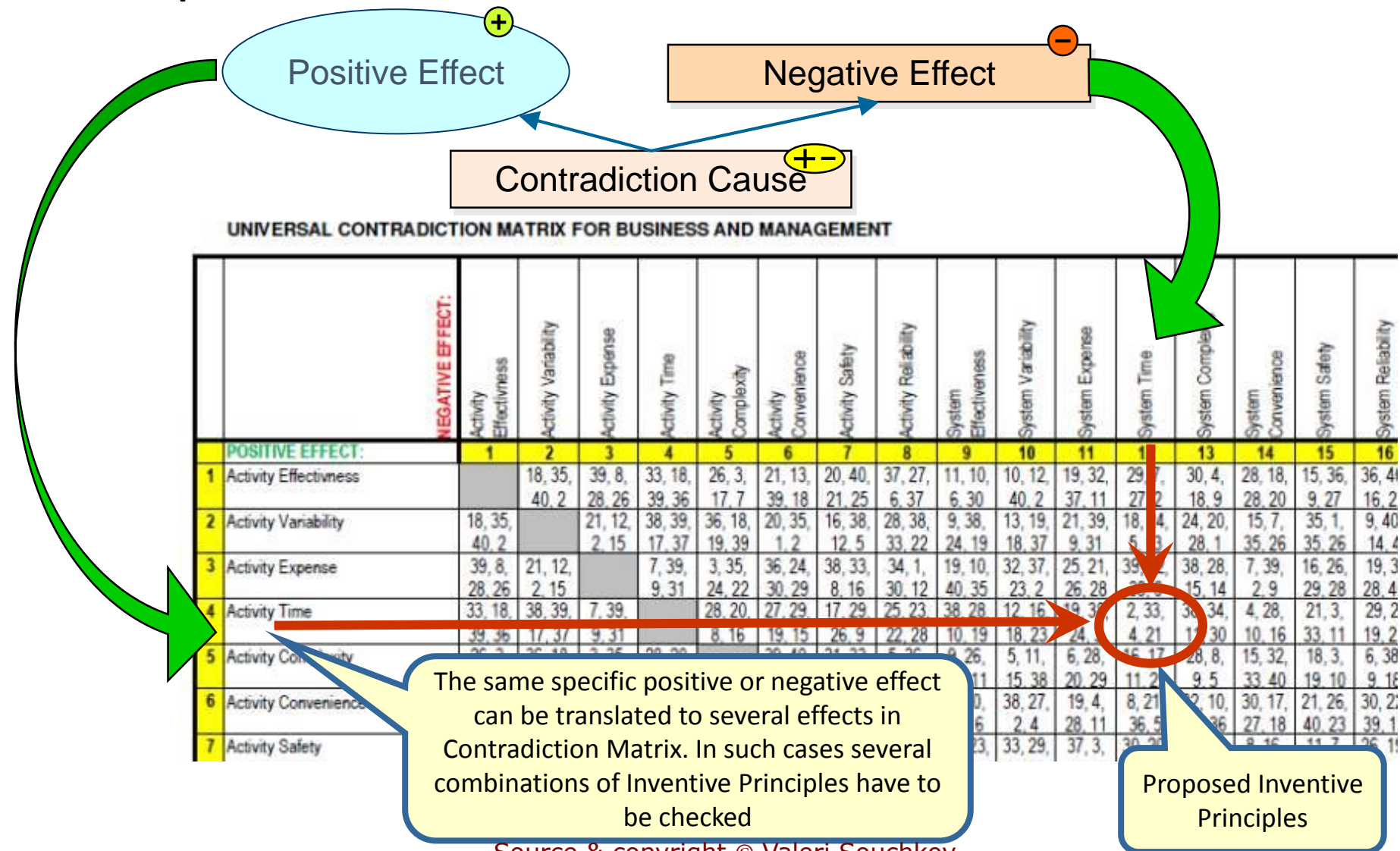|	Contradiction	Positive effect parameter/ Negative effect parameter
1	Customers are busy	**Need to provide Convenience services(4.Activity Time)/ Customers want their own convenience and save time (30.Customer Stability)**

Positive / Negative effect parameter

1.Activity Effectiveness. 2.Activity Variability. 3.Activity Expense. 4.Activity Time.
5.Activity Complexity. 6.Activity Convenience. 7.Activity Safety. 8. Activity Reliability.
9.System Effectiveness. 10. System Variability. 11.System Variability. 12. System Time.
13.System Complexity. 14. System Convenience. 15. System Safety. 16.System Reliability.
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24. Harmful Effects to System. 25. Harmful Effects from System.
26.Adaptability /Versatility.
27.Organizational Tension. 28.Organizational Stability.
29.Customer tension. 30.Customer Stability.
31. Environment Stability.

Step 4: Find the applicable inventive principle from the contradiction matrix (Business)

(1,2,12, 31)

Inventive Principles

#4 **Activity Time** ↔ #30 **Customer Stability**

Generic Contradictions

Convenient Service

Convenient and Save Time

Customers are busy

Specific Contradiction

Step 4a Contradiction Matrix

The same specific positive or negative effect can be translated to several effects in Contradiction Matrix. In such cases several combinations of Inventive Principles have to be checked

Proposed Inventive Principles

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Step 4a Find Inventive principles

UNIVERSAL CONTRADICTION MATRIX FOR BUSINESS AND MANAGEMENT

Step 4a Find Inventive Principles

		29 Customer Tension	30 Customer Stability	31 Environment Stability
3	Activity Expense	2,39, 17,22	3,25,16,35	36,30,32,2
4	Activity Time	1,31,23,40	1,2,12, 31	27,35,7,1
5	Activity Complexity	27,39,40,16	7,33,13,31	5,34,24,16

*1,2,12, 31 are the proposed inventive principles

Step 5: Solutions

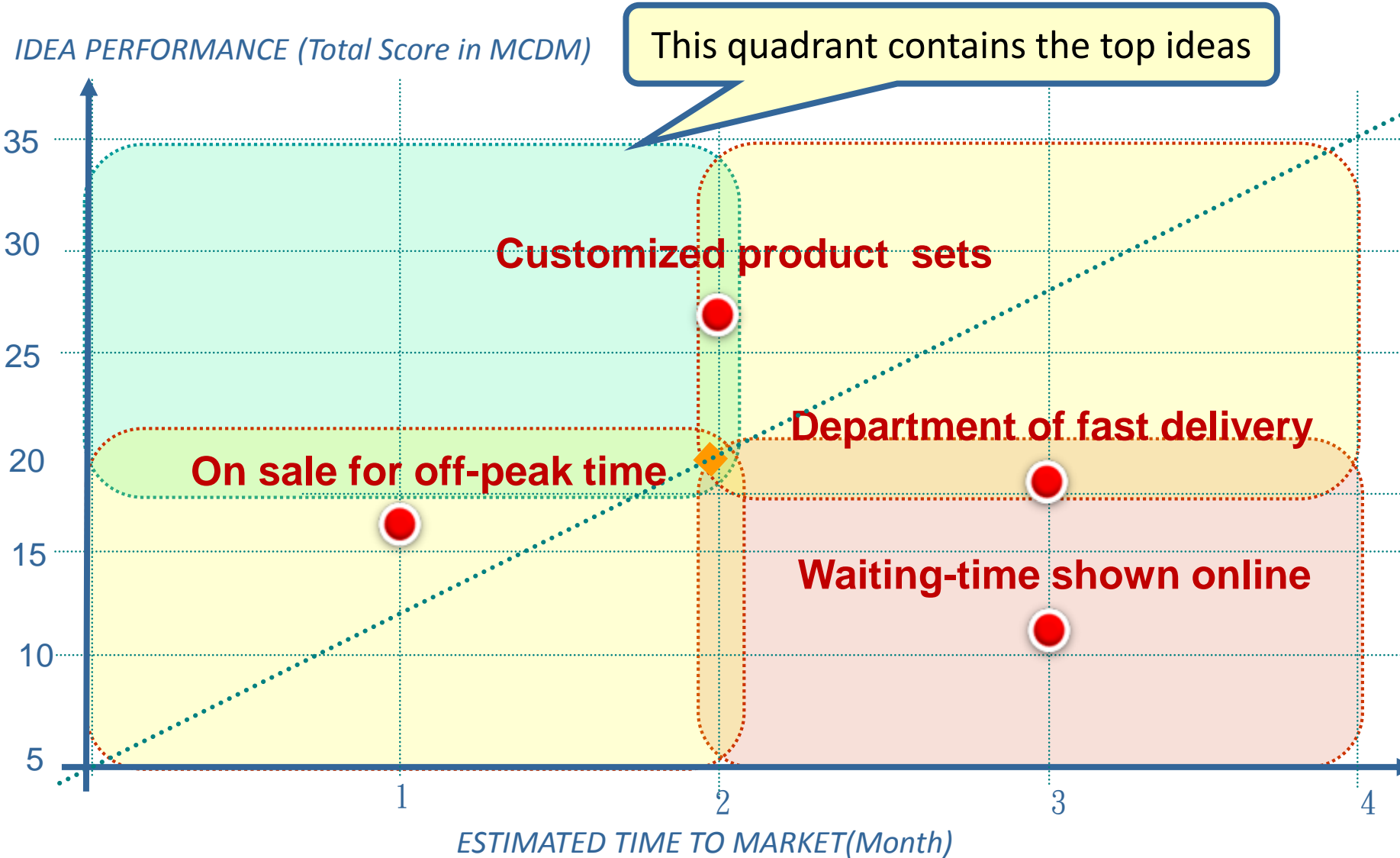| #	Ideas
1	**Customized product sets**
2	**Department of fast delivery**
3	**On sale for off-peak time**
4	**Waiting-time shown on internet**

Step 6: Evaluation and ideas landscaping

Idea #	Ideas	1.Check out in 10 s	2.Kindly attitude	3.Number of staff	4.Revenue	5.Cost increase below 15%	6.Satisfaction	Total score	Final rank
	Weight - >	9	4	5	8	7	10		
1	Customized product sets	1	-1	1	0	1	1	27	1
2	Dep. of fast delivery	1	1	-1	1	-1	1	19	2
3	On sale for off-peak	1	1	1	-1	1	0	17	3
4	Waiting-time shown online	1	-1	1	1	-1	0	11	4

Estimating Time to Market (ETM)

NO.	Ideas	Time to market
1	**Customized product sets**	2 months
2	**Department of fast delivery**	3 months
3	**On sale for off-peak time**	1 month
4	**Waiting-time shown online**	3 months

Ideas landscape

Original order of ideas

No	Ideas
1	**Customized product sets**
2	On sale for off-peak time
3	Department of fast delivery
4	Waiting-time shown online

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