GAME: Lean tools implementation in knowledge work on the example of analysis of a planning processes

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„Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity"

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Project Title

„Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity"

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2

Why should you play this game?

- When there is a delay in a product delivery to a client everybody usually blame production department

- People don't realize how much waste a planning process can cause

- People don't realize how much one employee's work can influence on a work of an another employees

- People are mostly thinking about own benefits without taking into consideration goals of the whole company

Steps of the game

STEP 1 – Production planning according to the established rules.

STEP 2 – Problems analysis with the use of A3 report, implementation of Hoshin Kanri to obtain improvements.

STEP 3 – Production planning according to the new rules.

STEP 4 – Results assessment.

4

Visualization of the products

STEP 1

5

3 profiles   3 colors

The goals of the game

The main goals are:

- Learning how to apply lean tools in knowledge work

- Identification of dependency between different work stands and steps of a process
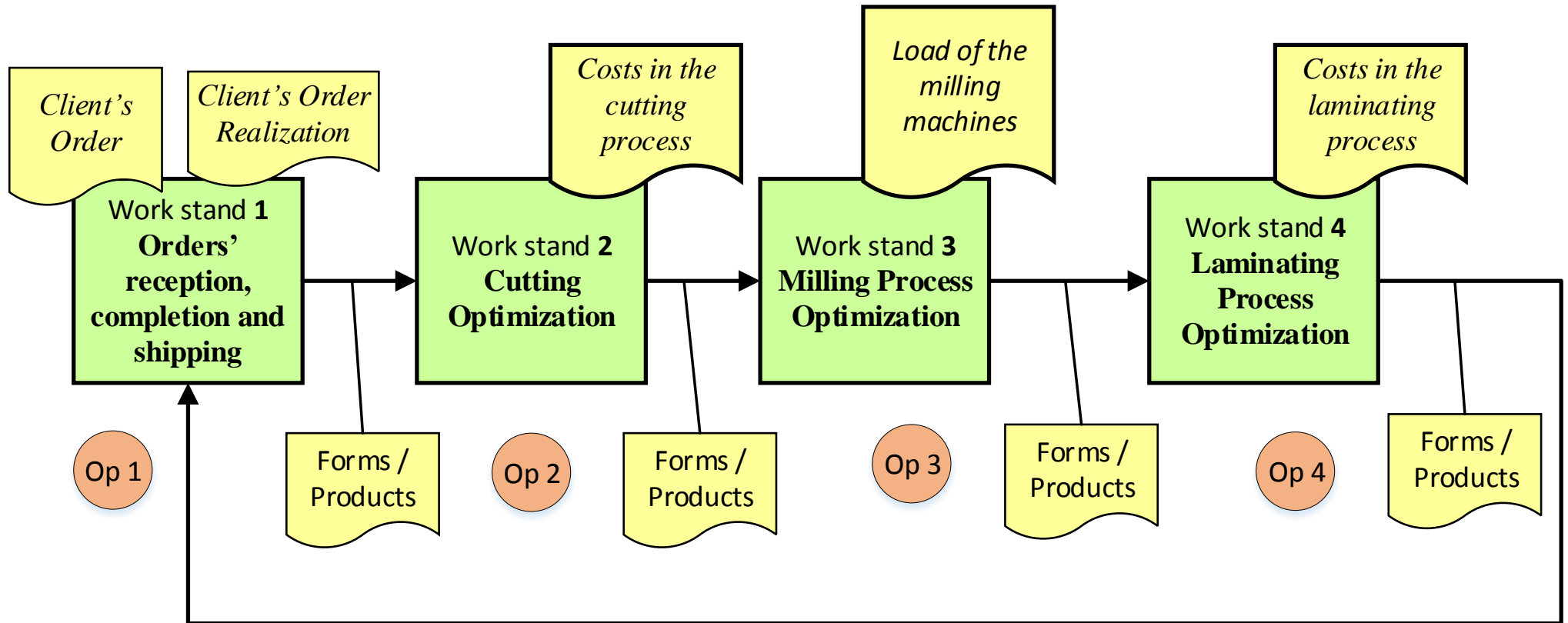
Additional goals for a team are:

- Identification of the wastes in the planning process

- Identification of possibilities of time waste minimization

- Identification of possibilities of cost minimization

- Identification of possibilities of profit maximization
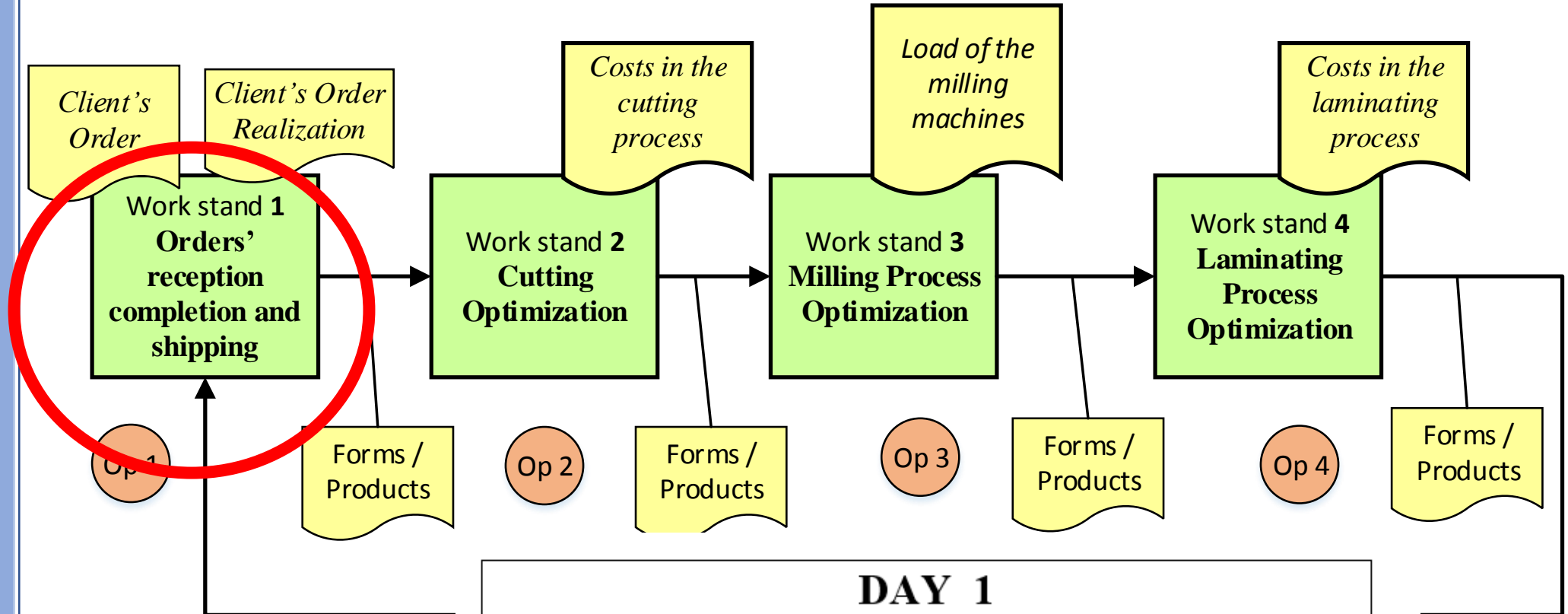
STEP 1

6

The information flow

Clients' orders

Formats

STEP 1

9

Number of days in which the format have to be completed

One day dedicated for **cutting** process

One day dedicated for **milling** process

One day dedicated for **laminating** process

Size of the format

70

X	X	X	X				
X	X	X					

Day	Client	Profile	Color
1	C-1	A	P

Day of the order receiving

Client

Profile of the format

Color of the front

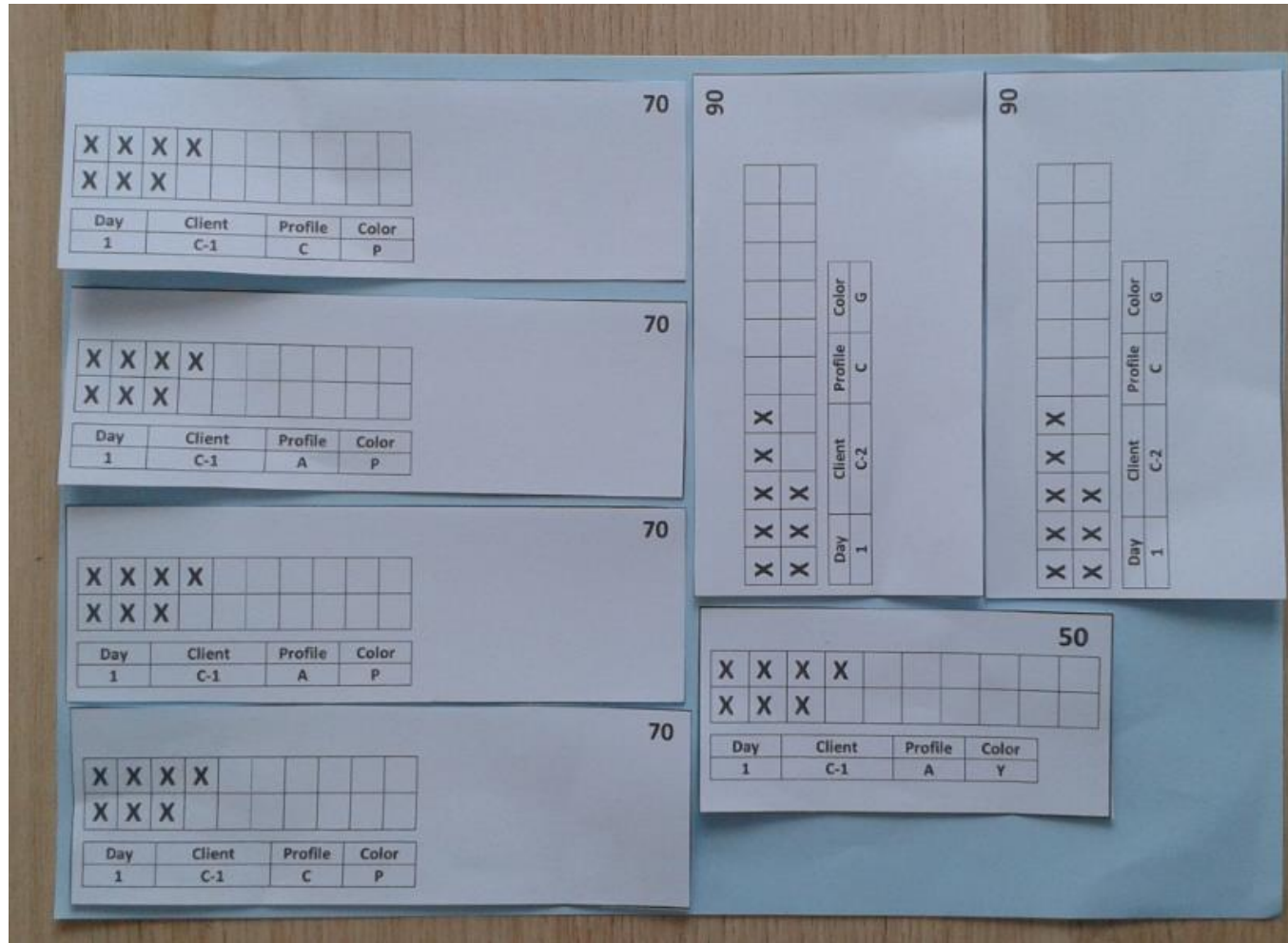# Optimization of the cutting process

STEP 1

10

Optimization of the cutting process

In case of delay

STEP 1

12

> Put „C" if the product can't be cut in a day in which it comes to the planning of the **cutting process**

70

X	X	X	X						
X	X	X	C						

Day	Client		Profile	Color
1	C-1		A	P

Costs of waste in cutting process calculation

CUTTING PROCESS
600 cm² per a day
1 cm² = 1 EURO

Day	Material used	Waste	Costs
1	510	90	90
2			
3			

Fulfill the form
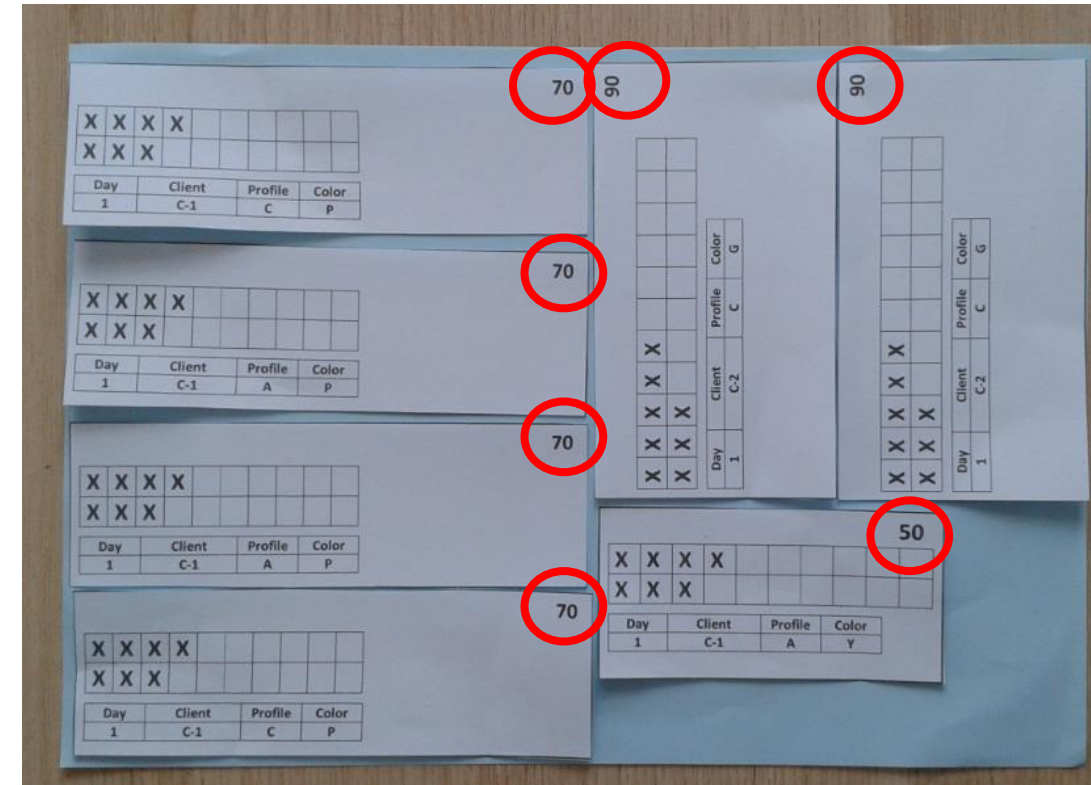
Formats placed on the
A4 piece of paper

Milling process optimization

STEP 1

14

Milling process optimization

Format

Erasmus+

STEP 1

16
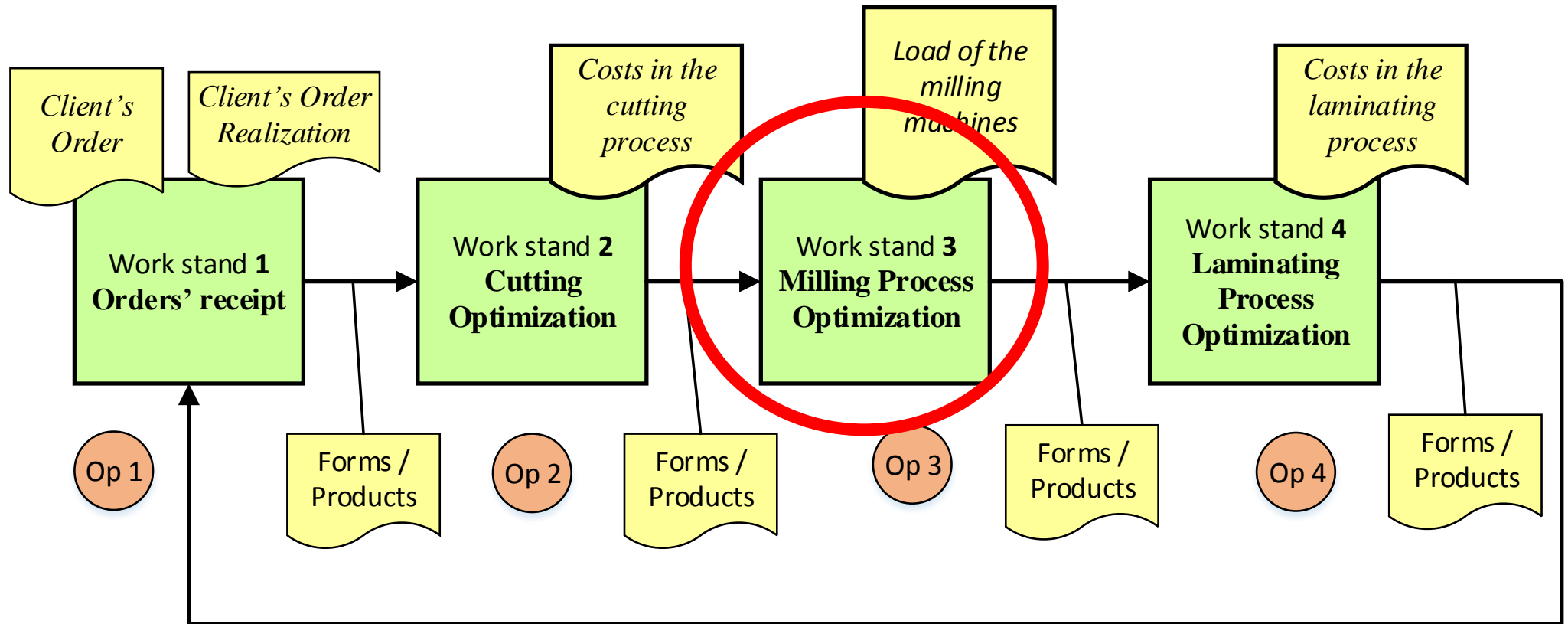
Put „M" if the product can't be milled in a day in which it came to the planning of the **milling process**

70

X	X	X	X						
X	X	X	C	M					

Day	Client		Profile	Color
1	C-1		A	P

Optimization of the milling process
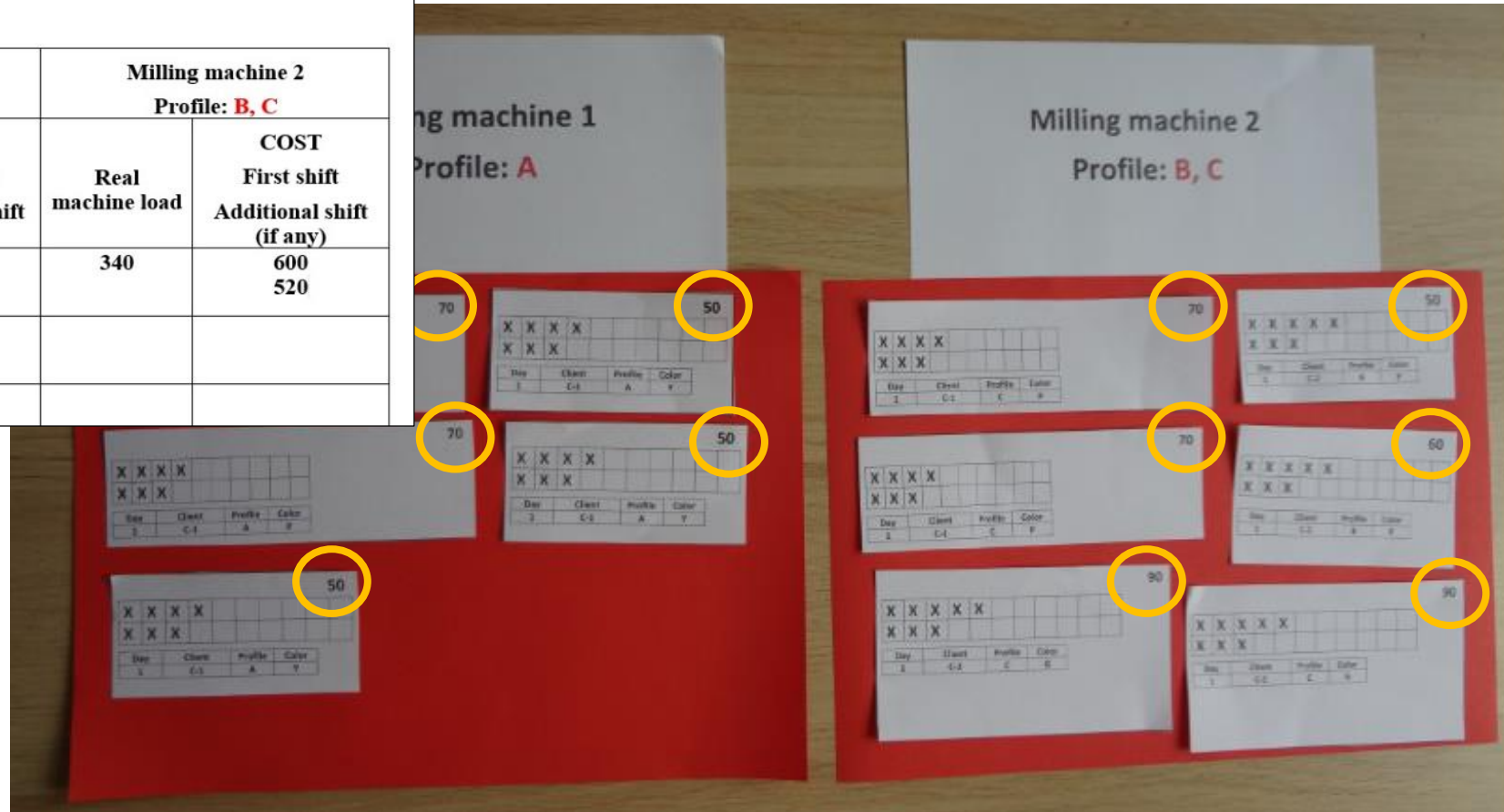
Erasmus+

STEP 1

17

Machines loading

Fulfill the form

MILLING PROCESS
2 x 300 cm² per a day
1 cm² = 2 EURO
1 cm² = 4 EURO in additional shift

Day	Milling machine 1 Profile: A		Milling machine 2 Profile: B, C	
	Real machine load	COST First shift / Additional shift (if any)	Real machine load	COST First shift / Additional shift (if any)
1	290	580 / 0	340	600 / 520
2				
3				

Laminating process optimization
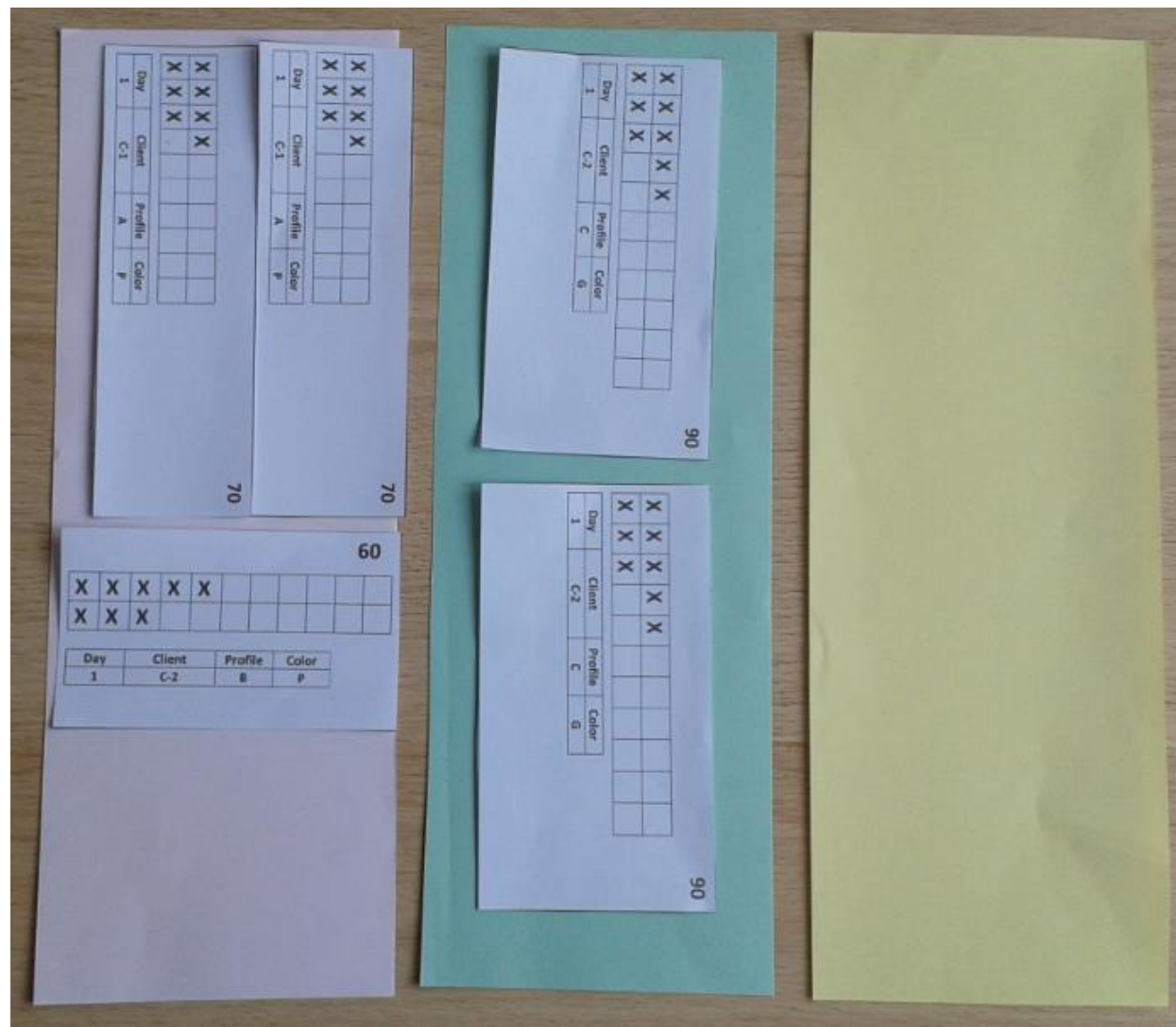

STEP 1

18

Laminating process optimization

Format

STEP 1

20
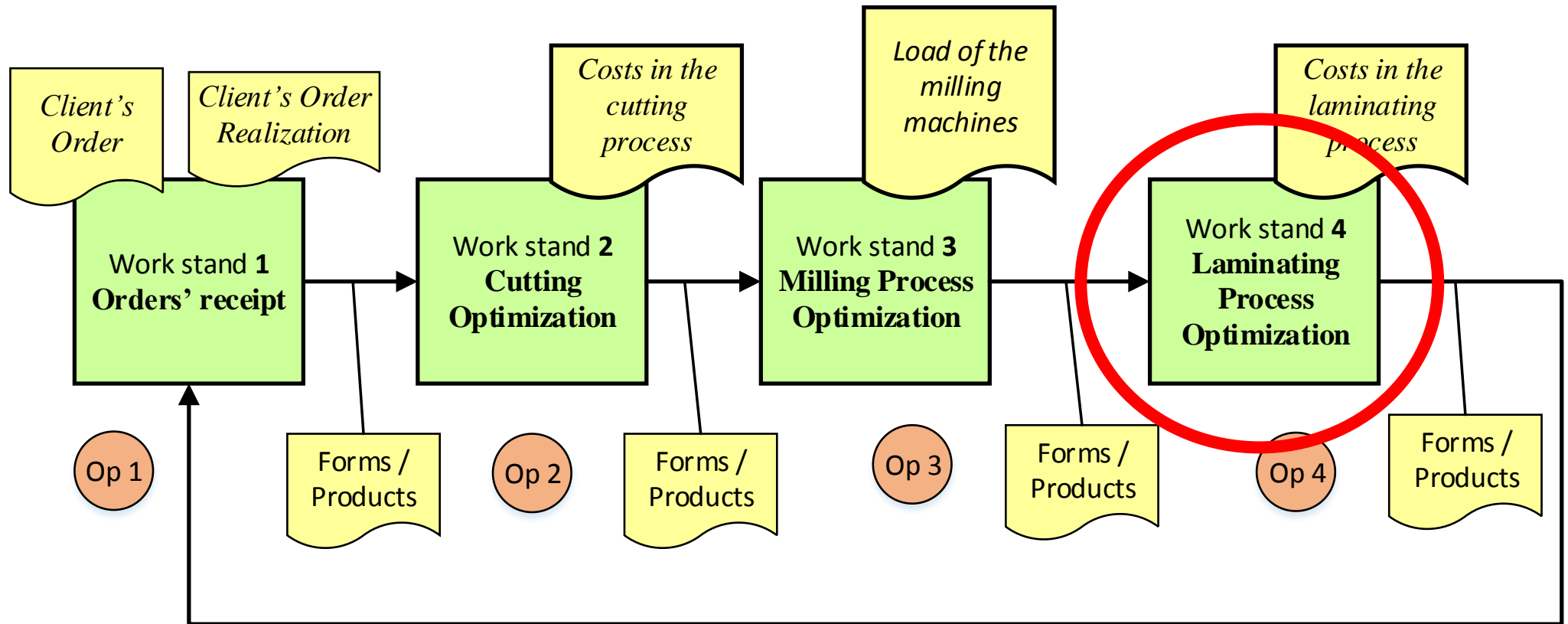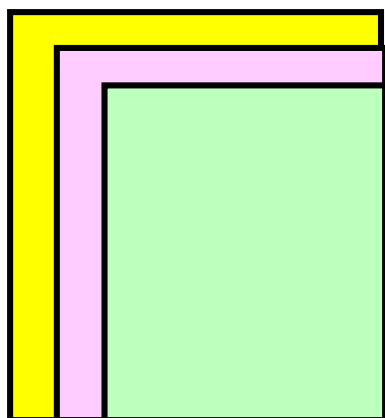
Put „L" if the product can't be laminated in a day in which it came to the planning of the **laminating process**

70

X	X	X	X						
X	X	X	C	M	L				

Day	Client		Profile	Color
1	C-1		A	P

Optimization of the laminating process

LAMINATING PROCESS
2 x 300 cm² per a day
1 cm² = 3 EURO

Day	Material used	Waste	Costs
1	380	220	660
2			
3			
4			
5			

Fulfill the form

Formats placed on the ½ of A4 pieces of paper
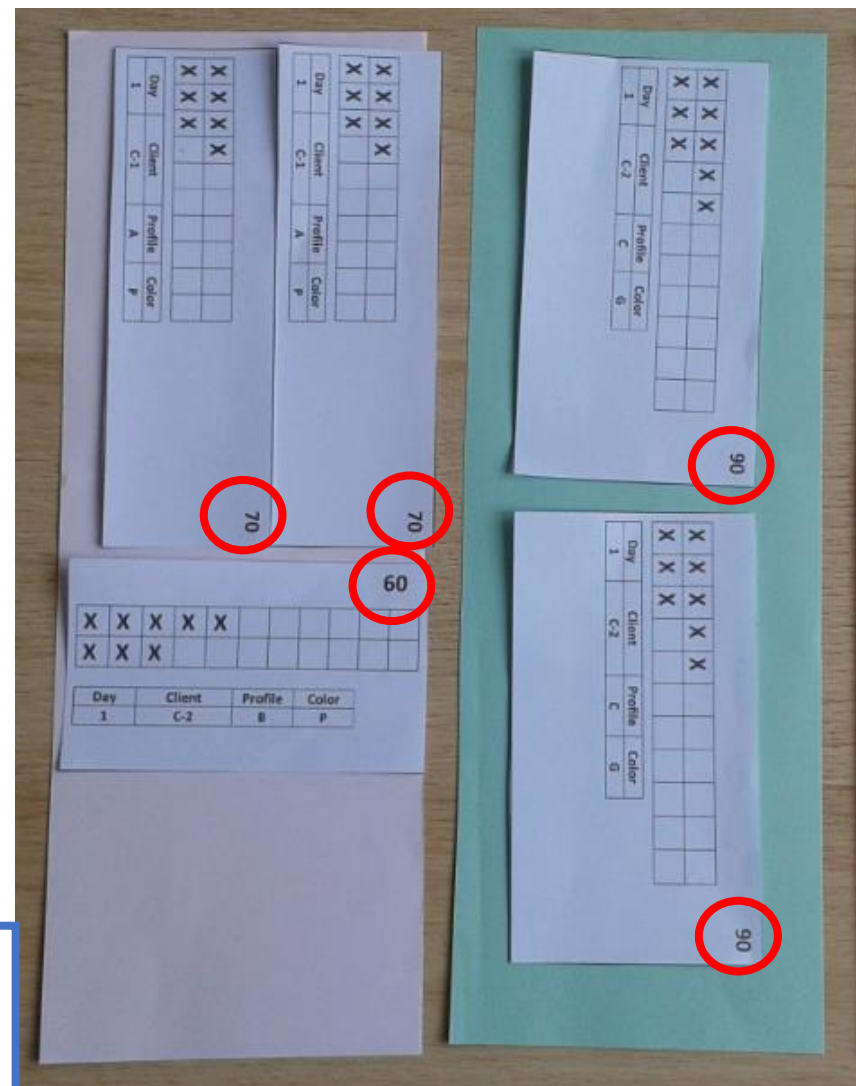
Orders completion and shipment

DAY 1					
Client	Size	Profile	Color	Number of pieces	Deadline
C-2	90	C	G	2	5 days
	60	B	P	1	
	50	B	P	1	

90

X	X	X	X	X					
X	X	X	C						

Day	Client	Profile	Color
1	C-2	C	G

90

X	X	X	X	X					
X	X	X	C	L	L				

Day	Client	Profile	Color
1	C-2	C	G

60

X	X	X	X	X					
X	X	X	C	M					

Day	Client	Profile	Color
1	C-2	B	P

50

X	X	X	X	X				
X	X	X	L	L				

Day	Client	Profile	Color
1	C-2	B	P

Orders completion and shipment

Fulfill the form

STEP 1

23

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ORDERS COMPLETIONS AND SHIPMENT

Client number	Work in Process (number of pieces x number of days)			Number of days of delay	Cost of delay 1day = 500 Euro
	C	M	L		
C-1	1	0	1	0	0
C-2	3	1	4	1	500
Sum of work in process	$\Sigma = 4$	$\Sigma = 1$	$\Sigma = 5$	Total cost	1000
Cost of Work in process (1 piece = 50 Euro)	200	50	250		

LET'S PLAY!

STEP 2

After 5 days of work each work stand assess the costs.

The game participants have to make an adequate analysis to answer the questions:

- Why the costs of the processes were so high?
- Why the clients didn't received the products on time?
- What can be done to improve the planning process?

25

Analysis

The game participants chose adequate lean tools to make a necessary analysis an implement chosen lean tools to improve the process.

It is recommended to implement **A3 report** for making the analysis and **Hoshin Kanri** for process improvement.

The winner is this team which will be able to achieve the best improvement. The improvement is assessed on the base of costs.

STEP 2

26

STEP 2

27

A3 REPORT

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| **Title: What do you want to write about?** | **An owner of the problem:** | **Date:** |

1. Problem description

Why do you want to write about this problem?

2. Current situation

What is a current situation?

Use visual tools to present the current situation (schemes, flowcharts, pictures, diagrams, VSM, spaghetti diagram etc.)

3. Goal(s), indicators

The goal(s) should be SMART (Specific, Measurable, Achievable, Realistic, Time-bound)

Indicators should give the possibility to assess improvements in the future

4. Analysis

What are the source causes of the problems?

Use a tool which will help you to find the causes of the problem (5xWhy?, Ishikawa diagram, interrelationship diagram, brainstorming, etc..)

5. Proposed countermeasures

What do you propose to implement to achieve the goal(s)?

How the proposed solutions can influence on the source causes of the problem and can change the current situation to achieve the future state?

6. Plan

What we have to do?

What is a deadline?

Who will be responsible for the activities?

How much it will cost?

You can use Gant chart, table or other visual tool.

7. Further improvement

What kind of problems can appear (risk analysis)?

Use PDCA to plan further improvement.

Assess what was achieved?

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STEP 2

28

A3 REPORT

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Title: What do you want to write about?	An owner of the problem:	Date:

1. Problem description

5. Proposed countermeasures

2. Current situation

3. Goal(s), indicators

6. Plan

4. Analysis

7. Further improvement

STEP 3

STEP 3

29

The improvements proposed by a team should be implemented and the game should be played again with the new rules.

RESULTS TABLE

	Team 1	Team 2	Team 3	Team 4
Cost of waste in cutting process				
Cost of waste in milling process				
Cost of waste in laminating process				
Cost of delayed deliveries				
Total costs				

STEP 4

30

Summary

The game participant after the game should realize that:

- Individual interest of an employee should be related to the business interest of the company (Hoshin Kanri)

- Individual costs calculation for a single point in the system without taking into account next steps in the process can increase total costs (Lean Accounting)

- Lack of the communication and feedback between people who realize the planning process can increase costs of the manufacturing process (Communication problems)

- Wrong planning rules can increase manufacturing costs (Planning rules)

31

Thank you for your attention!