Starting point of your group activity is an excerpt from a project. A trade fair has to be organized. After selecting one of three possible locations a booth is finally rented and the exhibition prepared. The planned steps are shown in the following chart.

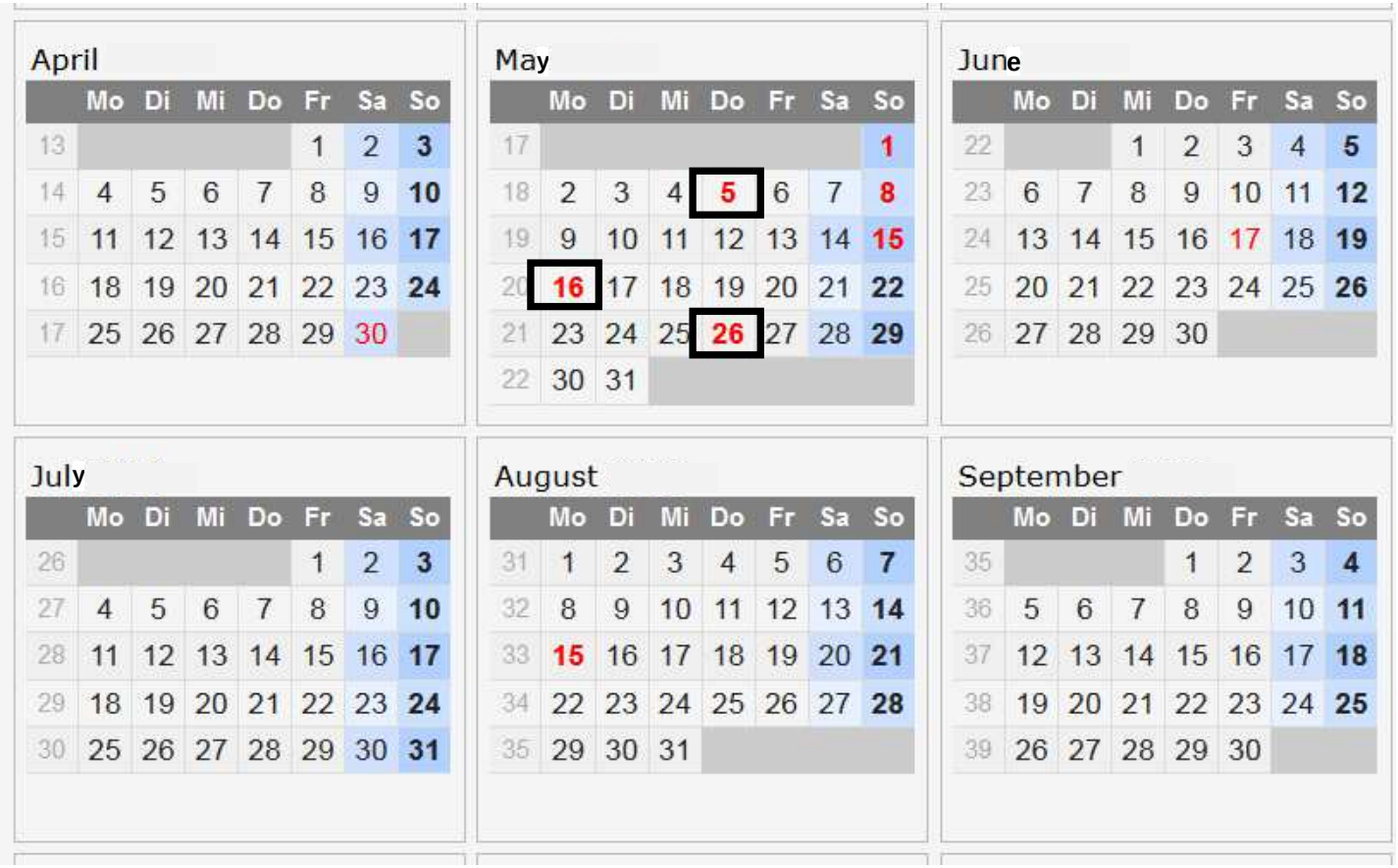
No.	Task	Duration/Type	Start date	Completion date	Responsibility	Preceding activity
	Select the Fair	**14,5 d**	**Mon 02.05.**	**Tue 24.05.**	**team**	
1	start (select the fair)	**Mst**	Mon 02.05.	Mon 02.05.		
2	examine fair A	8 d	Mon 02.05.	Thu 12.05.	Meier	1
3	examine fair B	8 d	Mon 02.05.	Mon 23.05.	Miller	1 (see remarks)
4	examine fair C	8 d	Mon 09.05.	Thu 19.05.	Lüdendorf	1 (see remarks)
5	decision meeting	4 h	Tue 24.05.	Tue 24.05.		2,3;4
6	end (select the fair)	**Mst**	Tue 24.05.	Tue 24.05.		5
	Rent the booth	**7,19 d**	**Tue 24.05.**	**Fri 03.06.**	**Meier**	
7	choose the booth	4 d	Tue 24.05.	Tue 31.05.	Meier	6
8	reserve the booth	1 h	Tue 31.05.	Tue 31.05.	Meier	7
9	informe Miller	**Mst**	Tue 31.05.	Tue 31.05.	Meier	simultaneously with 8 by cc
10	check the confirmation	0,5 h	Fri 03.06.	Fri 03.06.	Meier	8 +3 d waiting time
	Preparing the exhibition	**6,38 d**	**Tue 31.05.**	**Wed 08.06.**	**Miller**	
11	clarify who are the contact persons	3 h	Tue 31.05.	Tue 31.05.	Miller	9
12	order ID Cards	1 d	Fri 03.06.	Mon 16.06.	Miller	11 + 2 d waiting time
13	arrange equipment	1 d	Fri 03.06.	Mon 16.06.	Miller	11 + 2 d waiting time
14	reserve hotel rooms	4 h	Fri 03.06.	Mon 16.06.	Miller	11 + 2 d waiting time
15	deliver a short description for the exhibition program	1 h	Fri 03.06.	Fri 03.06.	Miller	11 + 2 d waiting time
16	create a planning documentation	3 d	Mon 06.06.	Wed 08.06.	Miller	12;13;14;15
17	finish the planning documentation	**Mst**	Wed 08.06.	Wed 08.06.	Miller	16

Remarks: **d**: working day **h**: hours, **Mst**: Milestone

Mr. Miller is on vacation from Friday, 6th May until the 17th May.

Mr. Lüdendorf is bound by another project from Monday, 02nd May, onwards. He is only available starting from Monday, 09.05.

Here you see a calendar of the project period. It may help you to get a better overview.



April

	Mo	Di	Mi	Do	Fr	Sa	So
13					1	2	3
14	4	5	6	7	8	9	10
15	11	12	13	14	15	16	17
16	18	19	20	21	22	23	24
17	25	26	27	28	29	30	

May

	Mo	Di	Mi	Do	Fr	Sa	So
17							1
18	2	3	4	5	6	7	8
19	9	10	11	12	13	14	15
20	16	17	18	19	20	21	22
21	23	24	25	26	27	28	29
22	30	31					

June

	Mo	Di	Mi	Do	Fr	Sa	So
22			1	2	3	4	5
23	6	7	8	9	10	11	12
24	13	14	15	16	17	18	19
25	20	21	22	23	24	25	26
26	27	28	29	30			

July

	Mo	Di	Mi	Do	Fr	Sa	So
26					1	2	3
27	4	5	6	7	8	9	10
28	11	12	13	14	15	16	17
29	18	19	20	21	22	23	24
30	25	26	27	28	29	30	31

August

	Mo	Di	Mi	Do	Fr	Sa	So
31	1	2	3	4	5	6	7
32	8	9	10	11	12	13	14
33	15	16	17	18	19	20	21
34	22	23	24	25	26	27	28
35	29	30	31				

September

	Mo	Di	Mi	Do	Fr	Sa	So
35				1	2	3	4
36	5	6	7	8	9	10	11
37	12	13	14	15	16	17	18
38	19	20	21	22	23	24	25
39	26	27	28	29	30		

Your team will deal with the „network analysis“ and the network diagram also known as a “logic diagram”.

Task 1
First we need a basic understanding of network principles. Please read the brief description carefully. Prepare a short presentation of the method based on the graph occurring on page 4. It shows the start situation of the activities from the table on page 1.

Please use the graph in your presentation (either by downloading the file on the virtual learning platform or by taking a picture of it with your smartphone; either way is fine). Point out the critical path.

The network diagram helps to manage your project

Hint: This information is based on three sources:
- Education Salzburg (see. http://www.land.salzburg.at/schule/methoden/netzplantechnik.html, ref. 29.09.14),
- Holland & Holland Enterprises Ltd (see http://www.successful-project-management.com/network-diagram.html, ref. 14.11.14),
- Michael C. Glen (see http://project.mvps.org/networkanalysis.htm)

Network analysis ends in a network diagram. The network diagram (see page 6) is a great way visualizing how your project is planned and it helps controlling the progress of projects. In the context of project planning, a network diagram is a sequence of tasks or activities, commonly represented by blocks that are linked together in the sequence they need to be carried out. If you follows the arrows, starting with task one, you are forward passing through the diagram, if you start at the end, you are backward passing. If tasks can be parallelized you will find more than one pass through the diagram. A selected pass through the diagram is called a path.

Software tools are able to produce a network diagram based on the structure of the task list, taking into account the interdependencies of the tasks. The diagram helps finding the most efficient and economical way to manage the project. Two things are needed for creating a network diagram: first an analysis of the structure of the project, second an analysis of the required time.

Structure analysis of the project
First one has to break down the project into single tasks. An example is the project task list on page 1. Each task gets a number. Further the sequence in which the tasks shall take place has to be found out. In the diagram each task is represented by a block. An arrow, linking two blocks shows time dependencies between them.

How to describe the tasks
Every task has the following attributes:

1. Task name / what to do	-	4. Duration of the task	Dur
2. Number of the task -	No	5. Earliest start time	ES
3. Name of the responsible person	R	6. Latest start time	LS

It is possible to require the following information out of these Values:

1. Earliest finish EF
2. Total float TF
3. Latest finish LF

For each task write the following values in a simple block:

Task name / what to do		
No.	R	Dur
ES	EF	TF

Afterwards you have to decide on the order of the tasks.

Determination of the sequence
Usually you will find one of the following logical relations between tasks. The most commonly used of these is the first one. Notice: In all following examples task 1 is the independent, task 2 the dependent one.

Finish-start (F-S)
Meaning: Task 1 has to be finished completely before task 2 can start.

Start-start (S-S)
Meaning: task 1 must have started before task 2 can start.
(Mr. Miller has to be informed just after starting the booth-reservation activities.)

Finish-Finish (F-F)
Meaning: Task 2 is not allowed to be finished before task 1
(The following case is a common one for this relationship for economic reasons: a) task 2 might start together with task 1, b) task 2 has just to be ready in time with task 1, c) task 2 takes less time than task 1, d) task 2 is (very) expensive)

After the structure of the project has been analyzed you can start to decide on the required time for the project/ tasks.

Time analysis

The ES-, LS- and TF-values of all task-blocks are analyzed for the whole Project.

Forward pass / how to calculate
Calculate the EF (earliest finish) of each task by using its ES (earliest start time) and Dur (duration):

Earliest finish (EF) = earliest start time (ES) + duration (Dur)

These values are important to find out the earliest finish time of the whole project followed by the slowest forward pass by starting at the earliest task(s). If you can choose between different paths, pick the slowest.

Backward pass / how to calculate
Calculating passing backwards, starting with the latest finish of a task of the project, helps to find out the critical path (see ff.) and visualizing the total float (see ff).

For every task the formula is: latest start time (LS) = latest finish (LF) – duration (Dur)

Follow the blocks and arrows backwards until reaching the beginning of the project. If you can choose between different paths take the one with the smallest value for the latest start time.

Critical path
For any task along the critical path you will notice:

- earliest start time (ES) = latest start time (LS)
- earliest finish (EF) = latest finish (LF)
- if it is delayed, the entire project will take longer.

Total float
The total float is the amount of time that a task can be delayed without causing a time lag to the next task. If such a delay occurs the task changes from a *noncritical task* into a *critical task*.

Usually a noncritical task should begin at the earliest start time (ES). Then the task gets finished after the given duration (Dur) at the earliest finish time (EF). There are no effects on other tasks or the duration of the entire project if there is any delay within the total float.

If the beginning of a former noncritical task is postponed to the latest start time (LS), the task has already become critical. If there shall be no effects on other tasks or the duration of the entire project, it must be completed until the latest finish (LF).

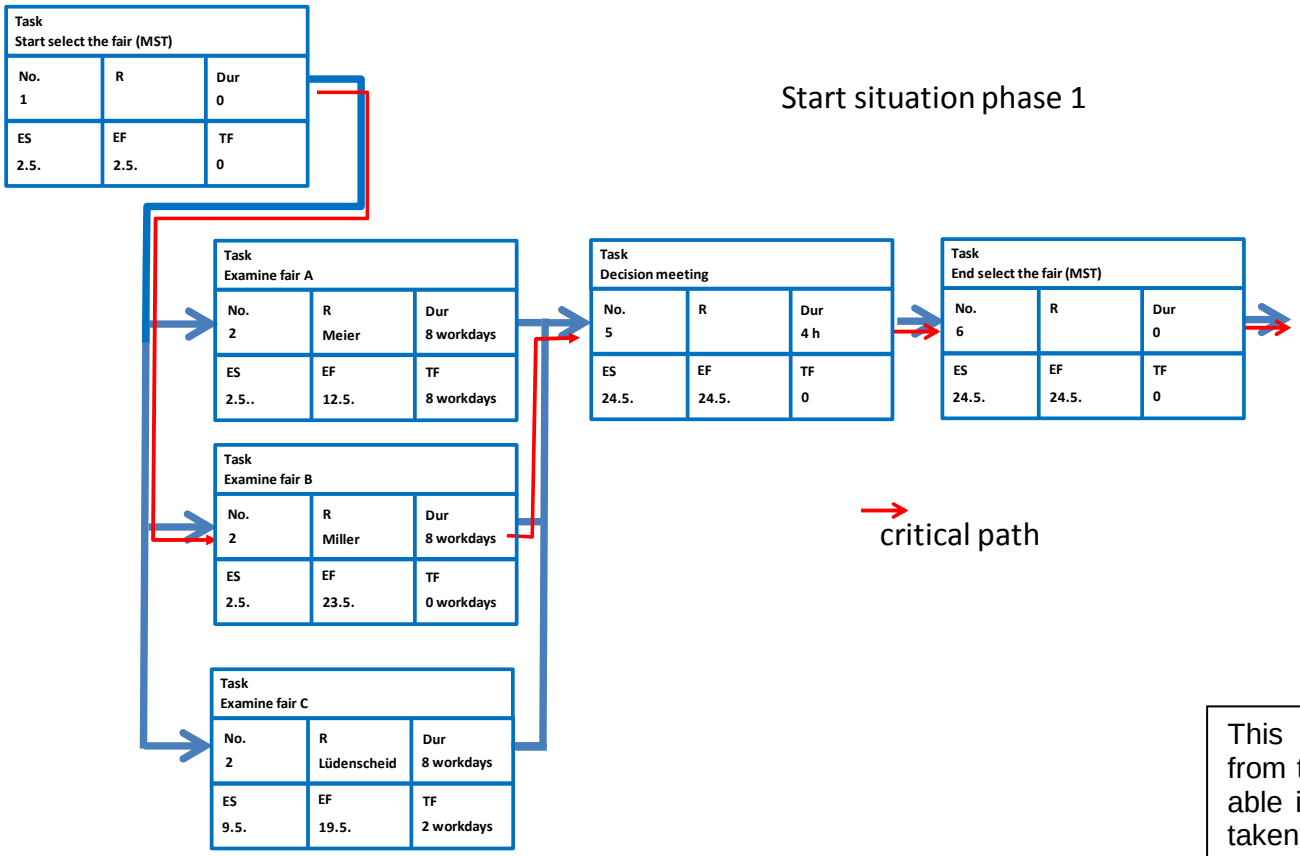
Advantages of the network analysis

The essential advantages of the method are:

- it shows the dependencies of different tasks
- forces a systematic approach
- reveals time buffers and tight schedules

Network analysis gives a good overview to the time schedule of a project. By using this method decisions become more transparent.

Network analysis supports Project Managers while planning and controlling projects. The Network diagram shows dependencies, critical tasks and the progress of a project on a glance. It helps to react immediately to delays and finding new solutions for critical developments.



Start situation phase 1

critical path

This Network diagram visualizes the first tasks from the list from page 1. Holidays and not available information of Miller and Lüdenscheid were taken into.

Task 2

Please go through the attached status reports 1-9. They belong to phase 1 (Select the fair) of the task list on page 1. Please pay attention to information on the completion of a task only. Beware of public holidays in cases the timetable is changing and take into account interdependent tasks.

You will find 9 prepared diagrams to fill in resulting changes (see page 18ff.). If a status report enforces a change write down the status report number, its date, all missing values and mark the new values. Figure out the critical path and mark it either. Possibly you don't need all of the prepared diagrams. Just take one of them, if changes occur.

Present your results to the others in one of the following ways: 1.) Take pictures of all of your diagrams and create a presentation of them, 2.) Download the PowerPoint-File you will find on your e-learning-platform. Transfer the values in the presentation and underline changes by colors.

The reports are only numbered in order to facilitate the discussion on them.

Status report 1

Project: **organization of trade fair involvement**		Responsible: **Miller**
Date: **4.5.**	Reasons for the status report: **Vacation** ☐ routine report ☐ milestone was reached ☐ problem report	**Examine fair B**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

The task started as planned on 02.05. and is progressing.

Suggestions for further proceeding

Status report 2

Project: **organization of trade fair involvement**		Responsible: **Meier**
Date: **9.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine fair A**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	☐	■	■	■
On-going is at risk	■	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

The reflections on trade fair A could not be started because of the inaccessibility of all involved partner. It was only possible to reach the secretary and make a telephone appointment (scheduled for Tue, 10/05).

Suggestions for further proceeding

Status report 3

Project: **organization of trade fair involvement**		Responsible: **Lüdendorf**
Date: **9.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine fair C**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

Task started today. Hence these forecasts are not very meaningful.

Suggestions for further proceeding

Status report 4

Project: **organization of trade fair involvement**		Responsible: **Meier**
Date: **17.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine fair A**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	☐	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	■	☐	☐	☐

Remarks:

The required contact persons were reached by phone on Tuesday, 10th May, as planned. They indicated to send an extensive information package. It will take some time to go through it and make a decision. The task should be finished by 25th of May.

Please accept my apologies for the missing problem report.

Suggestions for further proceeding

I suggest postponing the decision meeting on 27th of May.

Status report 5

Project: **organization of trade fair involvement**		Responsible: **Miller**
Date: **17.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine fair B**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

See status report from 4th of May, as I just returned from vacation today.

Suggestions for further proceeding

Status report 6

Project: **organization of trade fair involvement**		Responsible: **Lüdendorf**
Date: **17.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine fair C**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

Status of tasks as planned.

Suggestions for further proceeding

Status report 7

Project: **organization of trade fair involvement**		Responsible: **Meier**
Date: **23.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine trade A**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	☐	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	■	☐	☐	☐

Remarks:

The task will be finished at latest by Friday 27th of May, 2 p.m.

Suggestions for further proceeding

Adjournment of the decision meeting to Monday, 30th May.

.

Status report 8

Project: **organization of trade fair involvement**		Responsible: **Miller**
Date: **23.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine trade B**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

Everything is as planned.

Suggestions for further proceeding

Status report 9

Project: **organization of trade fair involvement**		Responsible: **Lüdendorf**
Date: **23.5.**	Reasons for the status report: ■ routine report ☐ milestone was reached ☐ problem report	**Examine trade C**

Status	**Deadline**	**Resources**	**Quality**	**Budget**
According to schedule	■	■	■	■
On-going is at risk	☐	☐	☐	☐
Time extension needed	☐	☐	☐	☐

Remarks:

The task was completed on Thursday night (in line with the schedule).

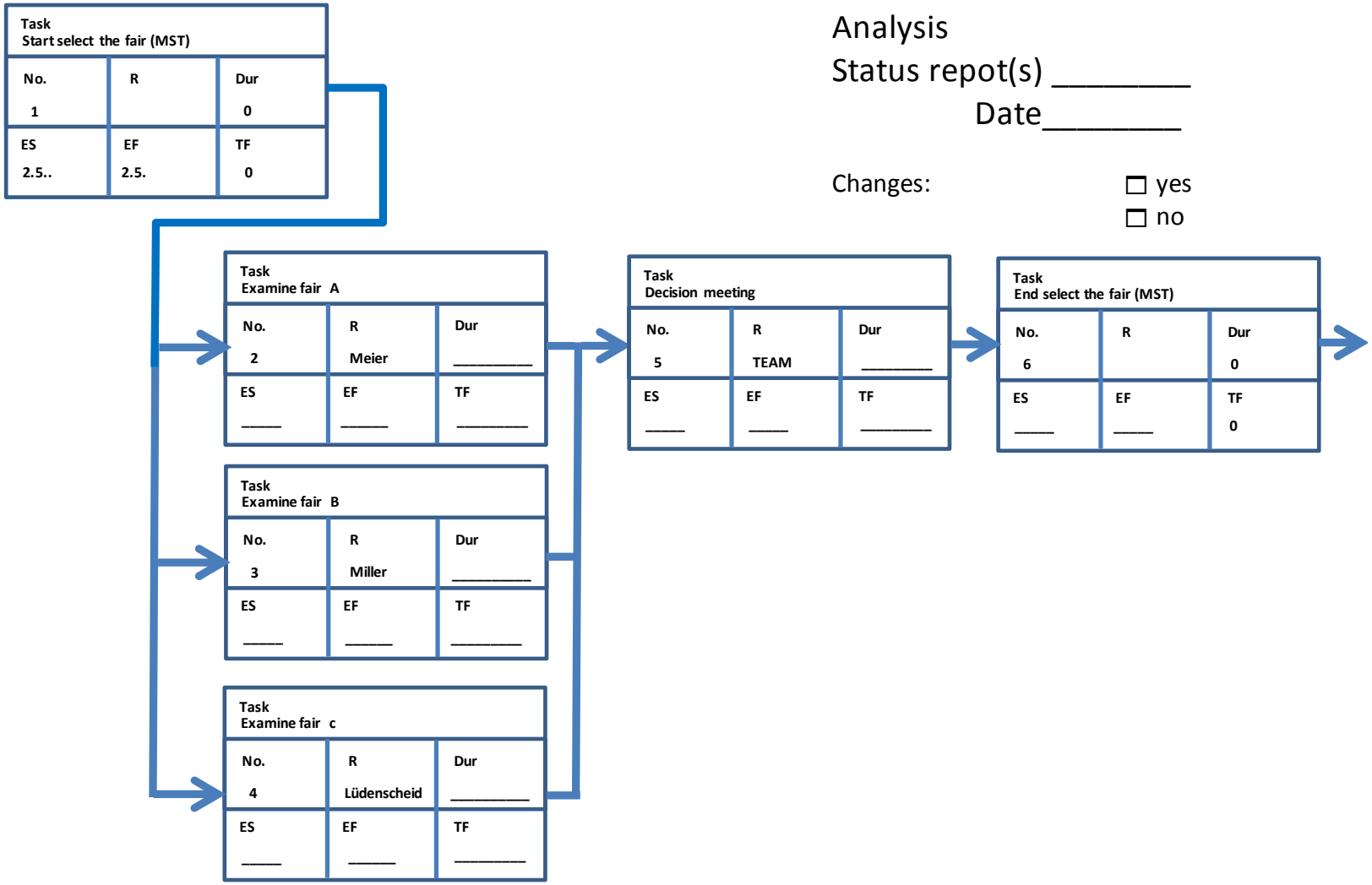
Suggestions for further proceeding

Excerpts of the minutes belonging to the Decision Meeting on 30th of May

All team members unanimously choose trade fair ….

The subsequent phase can be started.

…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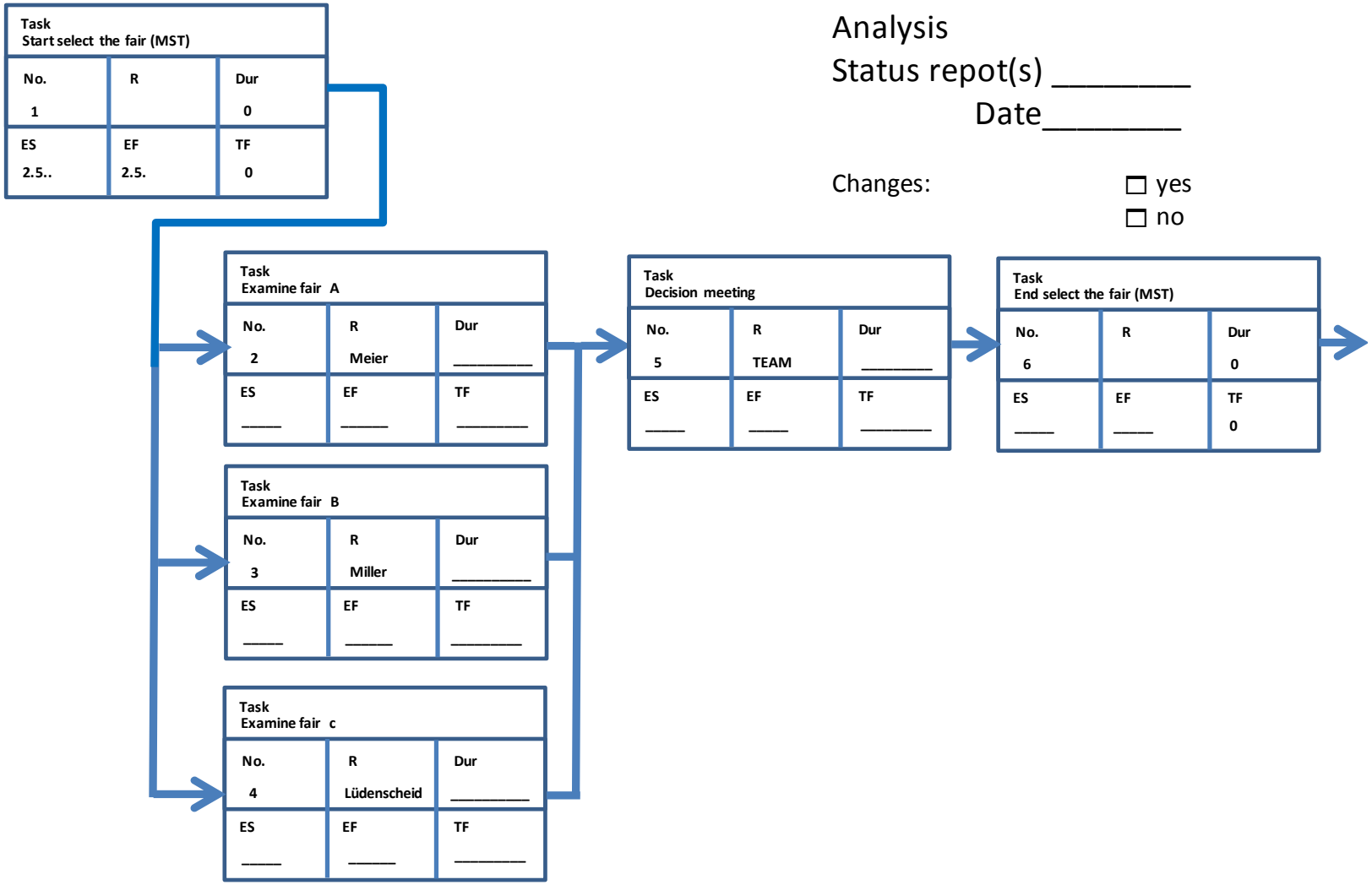
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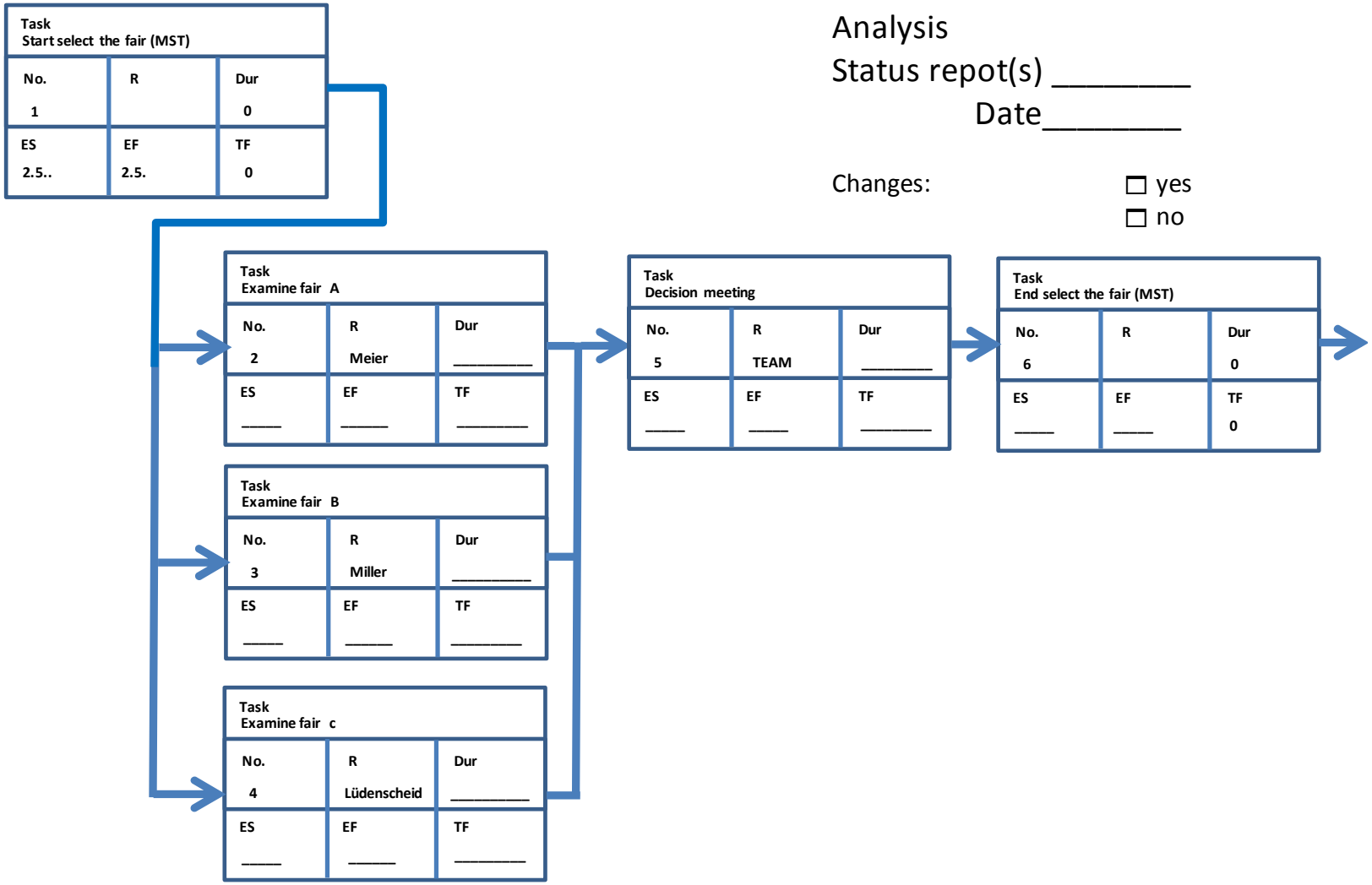
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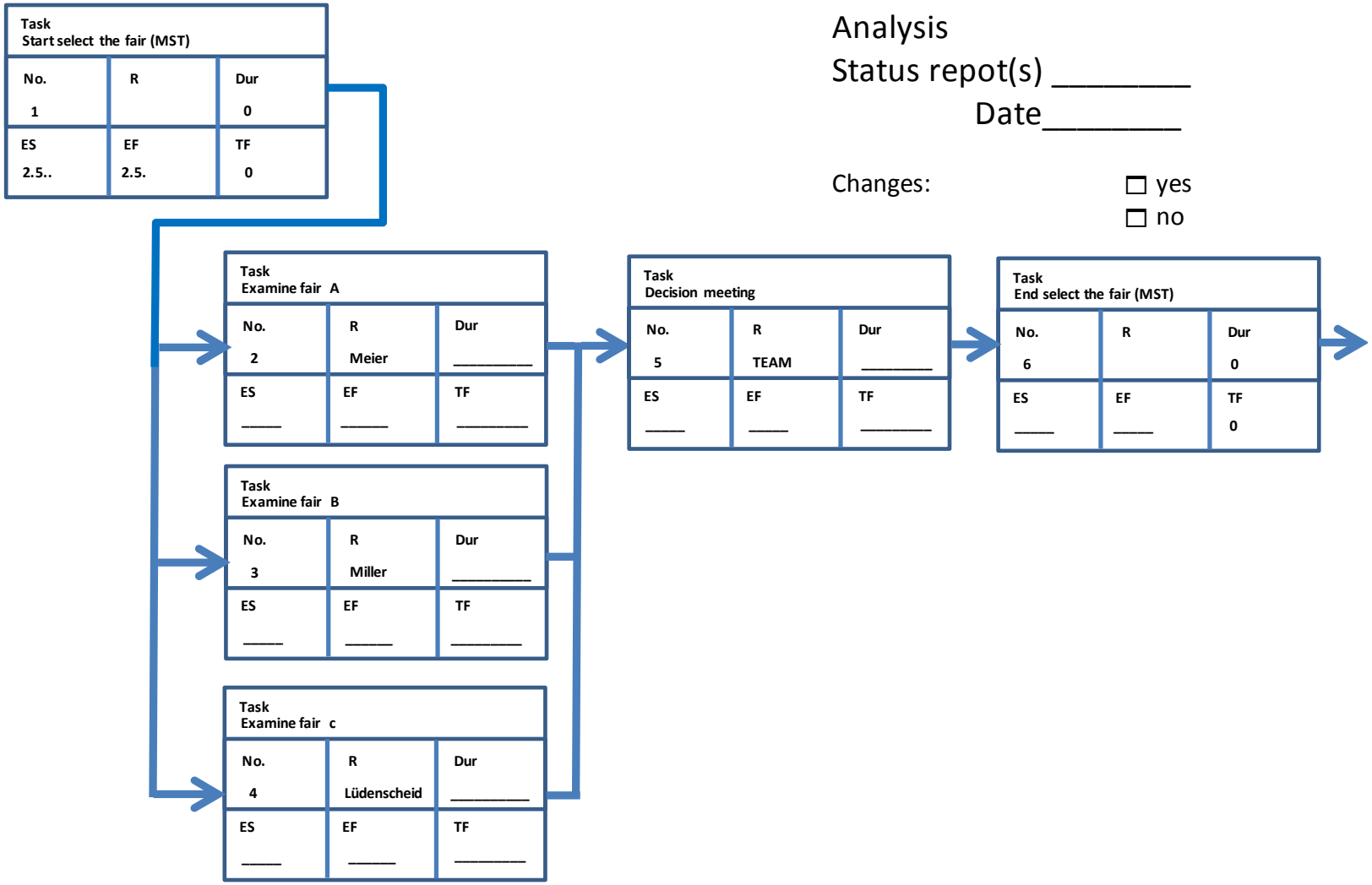
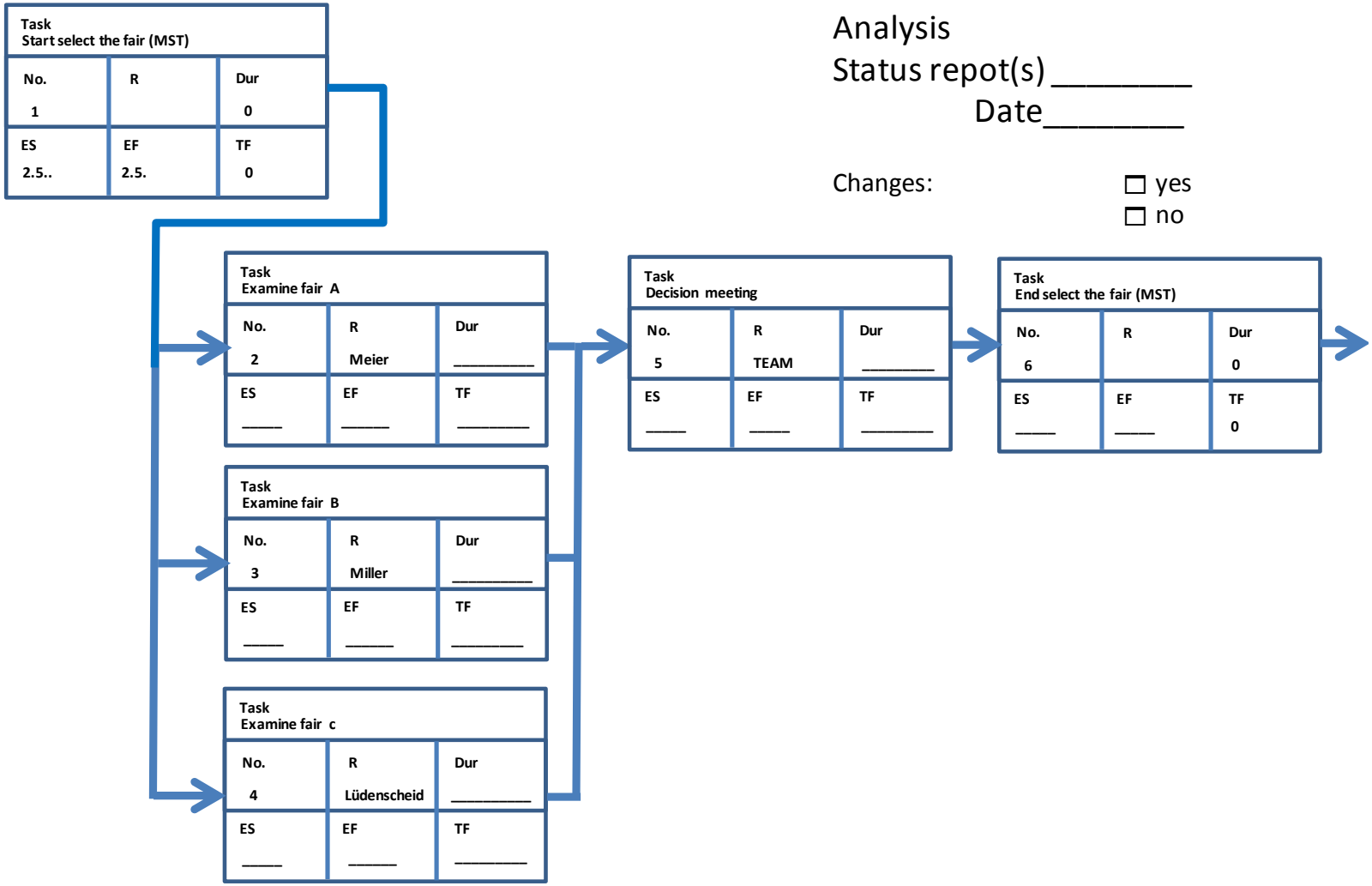


Analysis

Status repot(s) _____

Date_____

Changes: ☐ yes ☐ no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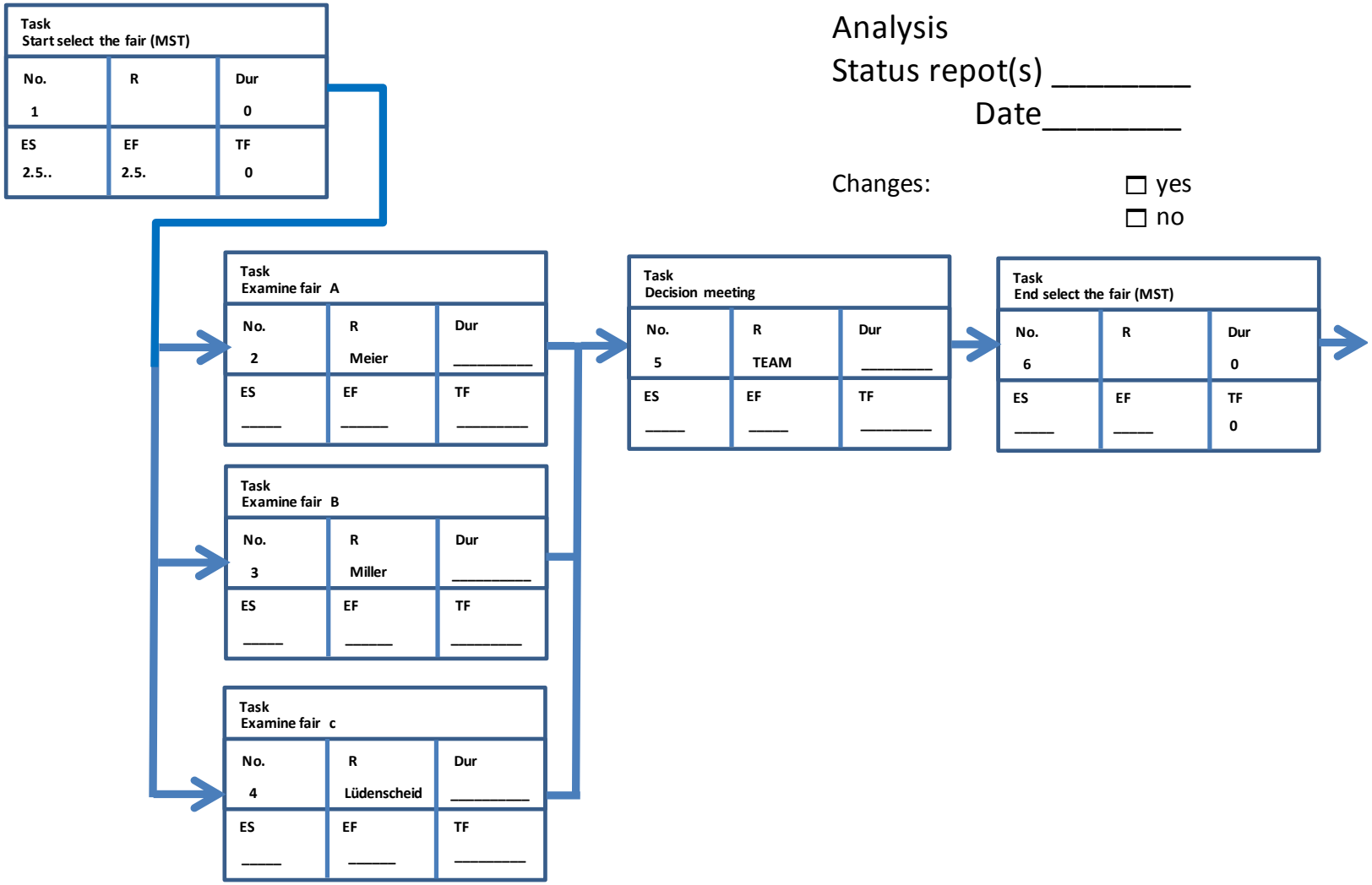
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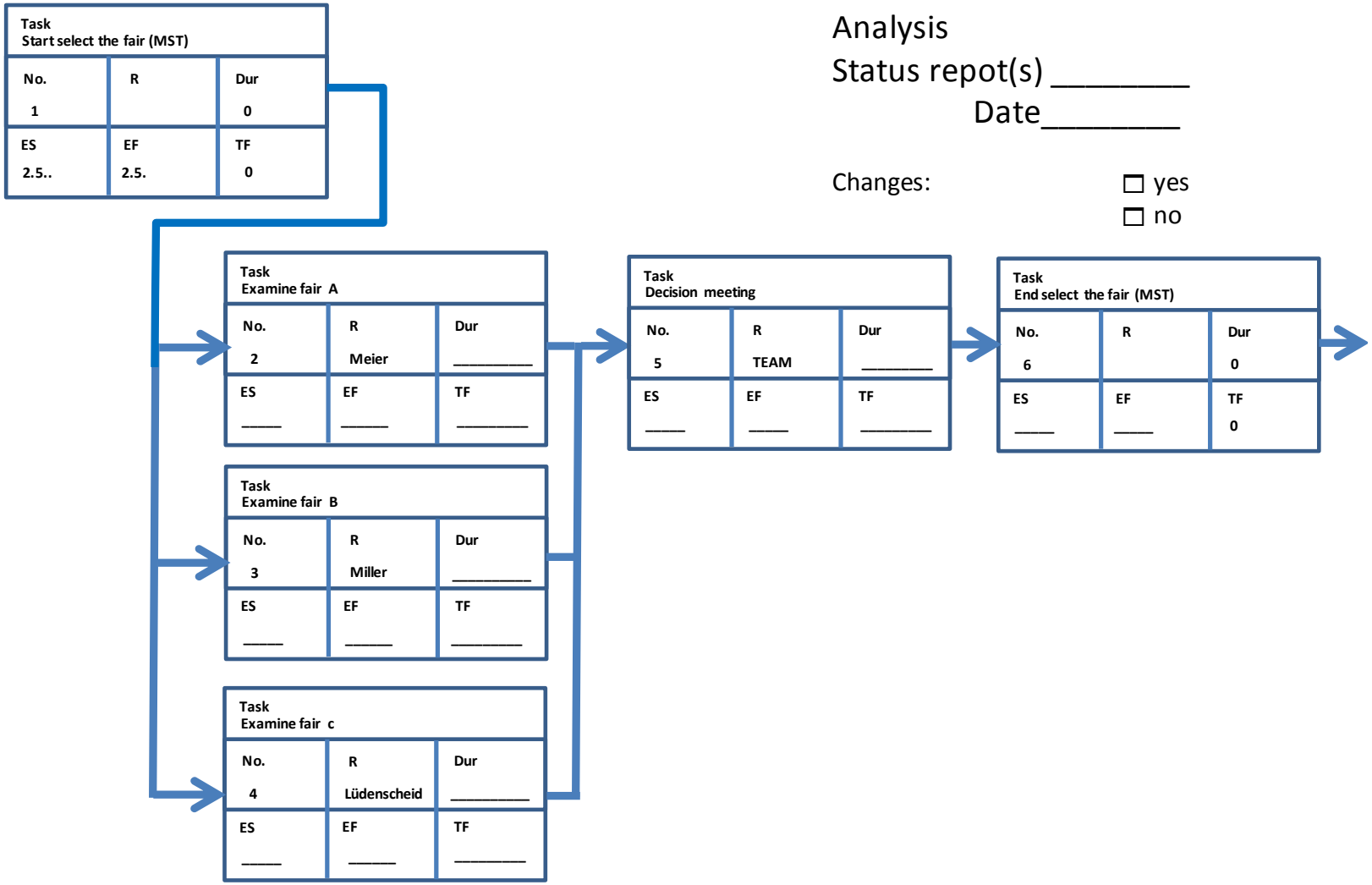
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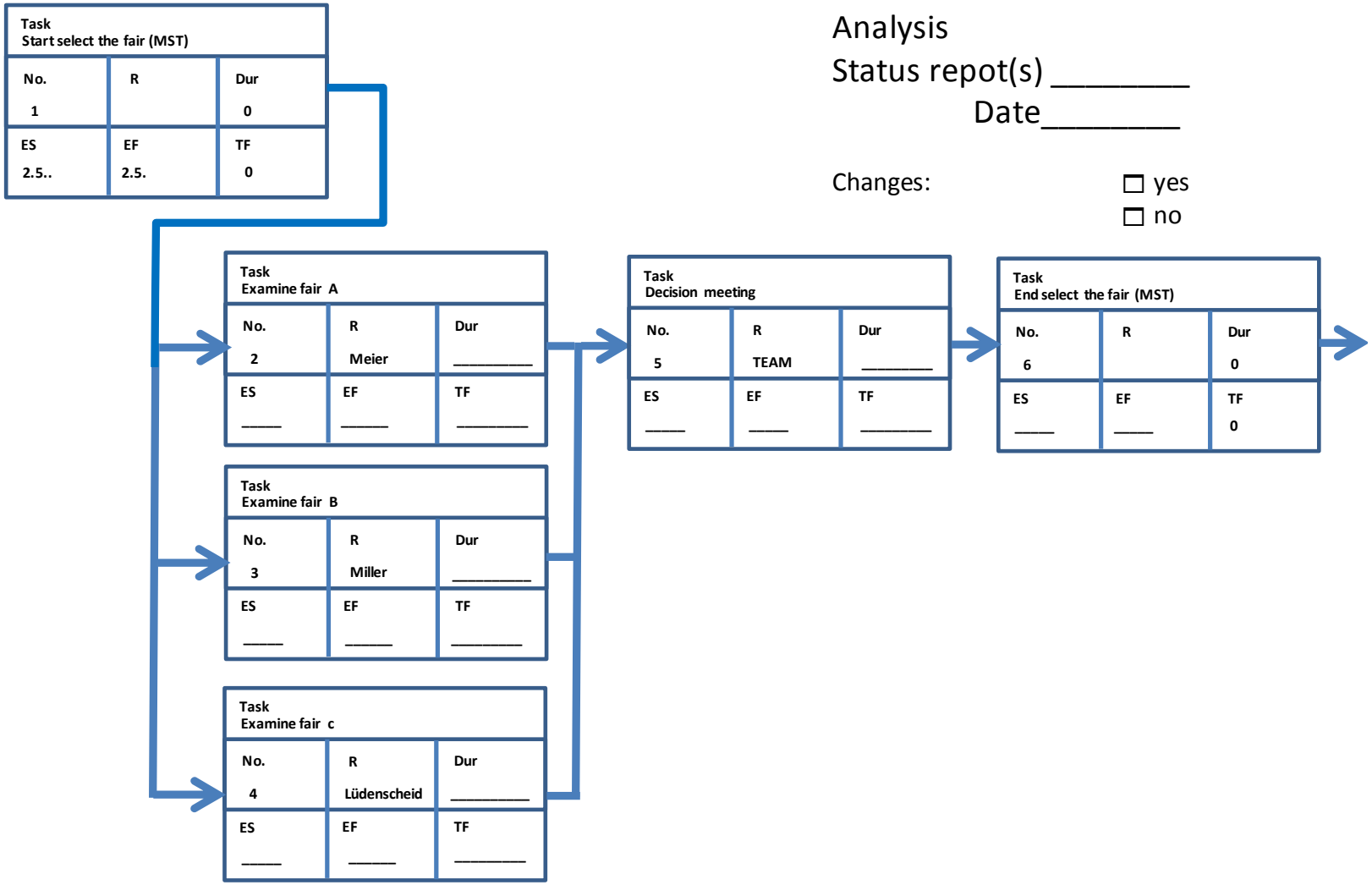
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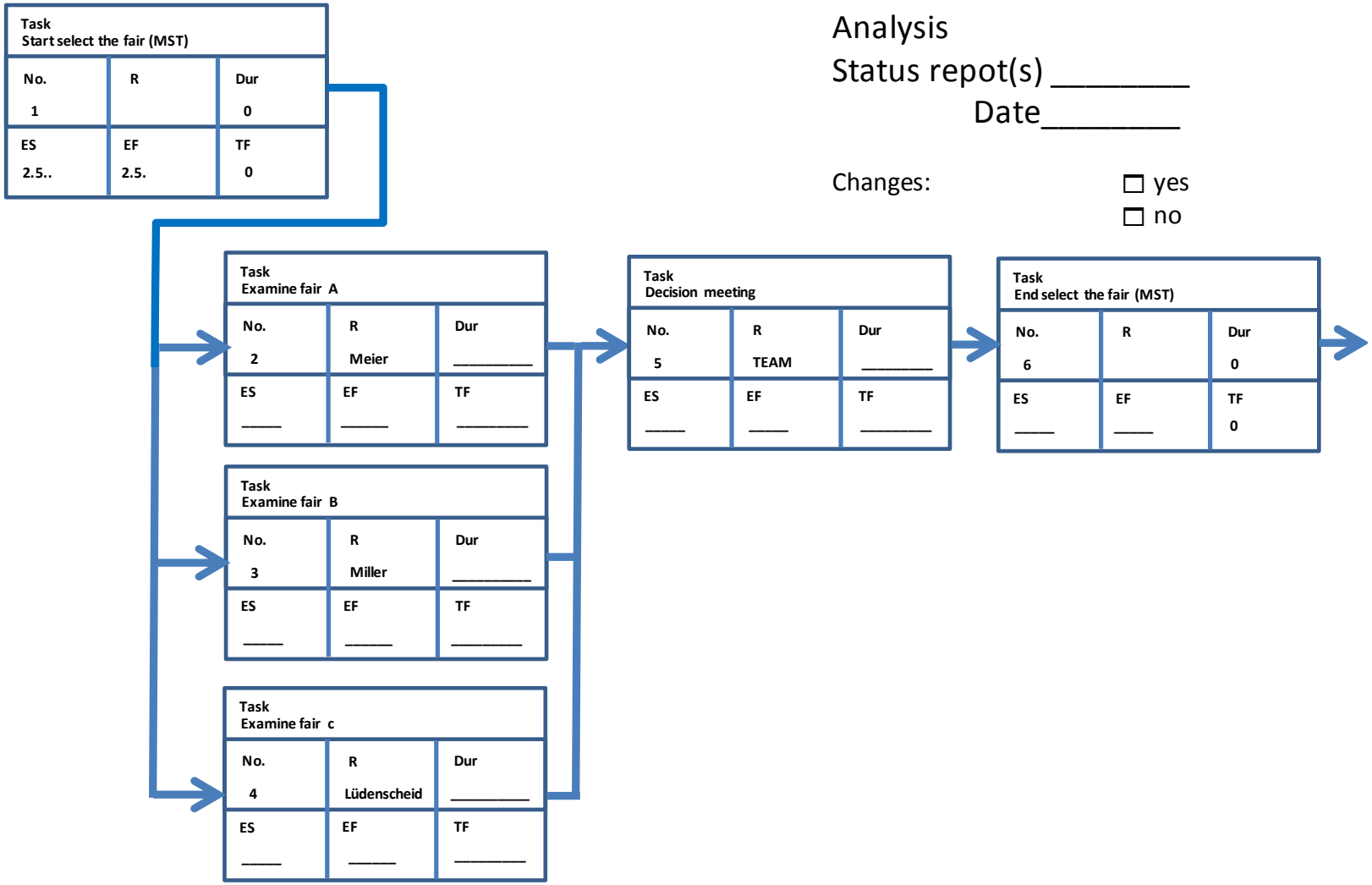
☐ yes
☐ no


Task
Start select the fair (MST)
No. 1
R
Dur 0
ES 2.5..
EF 2.5.
TF 0
Task
Examine fair A
No. 2
R Meier
Dur _____
ES ____
EF ____
TF _____
Task
Examine fair B
No. 3
R Miller
Dur _____
ES ____
EF ____
TF _____
Task
Examine fair c
No. 4
R Lüdenscheid
Dur _____
ES ____
EF ____
TF _____
Task
Decision meeting
No. 5
R TEAM
Dur _____
ES ____
EF ____
TF _____
Task
End select the fair (MST)
No. 6
R
Dur 0
ES ____
EF ____
TF 0
Analysis
Status repot(s) _____
Date_____
Changes:
☐ yes
☐ no