

MASARYK UNIVERSITY

FACULTY OF ECONOMICS AND ADMINISTRATION

BPH_EPS1 Enterprise Resource Planning Systems 1

UTILIZATION AND APPLICATION OF THE THEORY
OF CONSTRAINTS (TOC) AND CRITICAL CHAIN
(CC) AS A PROJECT MANAGEMENT

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Brno

2014

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1. *How would you apply CC and TOC tools for the planning of your own dissertation (writing the dissertation is in fact a project)? Can you name the project risks? Do you know how to diminish (reduce) these risk factors (to avoid obstacles)? 3*

2. *How would you persuade your new (in the future, after you start to work) colleagues, that CC project management methodology might be suitable for the project management? Can you define basic CC benefits? 7*

3. *What kind of effects do you expect by possible using buffers (time buffers) during the working out of your thesis (dissertation)? Can you explain what the buffer is?..... 8*

4. *Can you specify by use of Thinking Process Tools. Your personal bottleneck as far as studying processes or writing a work or working on assigned school tasks (by other tutors) is concerned? Try to use CRT – Current Reality Tree and create a list of Undesirable Effects (named by You). 9*

5. *State clearly your suggestions to improve your dissertation writing (project management question) and related benefits..... 10*

1. How would you apply CC and TOC tools for the planning of your own dissertation (writing the dissertation is in fact a project)? Can you name the project risks? Do you know how to diminish (reduce) these risk factors (to avoid obstacles)?

For planning opening a successful tennis club I will use basic steps of Theory of Constraints.

Preparatory steps:

1.1. Identify the goal of opening a successful tennis club

Opening a tennis club that generates benefits to owners.

1.2. Establish a way to measure progress to Goal

The features that we can use are the following:

- ✓ *Quality of work.* Measured by customer satisfaction.
- ✓ *Condition of facilities.* Measured by satisfaction of our customer and improvements that have taken place.
- ✓ *Number of members who pay the fee periodically.*
- ✓ *Volume of students enrolled in our activities concerning tennis.*

Main steps:

1.2.1. Identify the process constraint

For identifying process constraint first I need to make work plan prevision for opening a tennis club.

The work plan comprises the following activities:

- 1) Prevision of sales.
- 2) Prevision of purchases. Including consumables and physical assets.
- 3) Develop feasibility plan. Including the points 1 and 2.
- 4) Creation and registration of the company.
- 5) Capital contribution. Fully paid up.
- 6) Perform legal process for opening and operating.
- 7) Contract insurance and register the tennis club in the corresponding federation.
- 8) Tune up facilities for use.
- 9) Hire employees.
- 10) Advertise the business
- 11) Open the doors of club to customers.

When performing the above steps, we can find the following constraints:

- ✓ *Develop feasibility plan.* Is necessary to collect a lot of information and it is difficult know the time that will be necessary to carry it out.
- ✓ *Tune up facilities for use.* This will depend much on the previous state of the facilities and the amount of reforms we will have to make in them (It may be necessary to construct new facilities).

1.2.2. Suggestions for exploiting and subordinating process constraints of opening a tennis club are the following:

- ✓ Have the necessary resources to deal with the limitations. In this case, time and information to prepare the feasibility plan.
- ✓ Have the economic resources to deal with the project costs. Dispose enough capital to launch facilities and tackle business related expenditure.

1.2.3. To elevate constraint I can:

- ✓ Working hard to raise awareness of our business and deliver a quality product to our customers, always with maximum efficiency. Will be very important the customer treatment and philosophy of the business implemented by the owners.

Critical Chain Management

For constructing Critical Path for opening a tennis club firstly I need to determine how much time will be required for each activity and also the dependence between these.

Task	Time resources	Prerequisites
1. Prevision of sales	1-2 weeks	/
2. Prevision of purchases	1-2 weeks	/
3. Develop feasibility plan	4-5 weeks	1, 2
4. Capital contribution	1 week	3
5. Creation and registration of the company	1 week	4
6. Perform legal process for opening and operating	1 week	5
7. Contract insurance and register the tennis club	1 week	5
8. Tune up facilities for use	4-35 weeks	6
9. Hire employees	2-4 weeks	6,7,8
10. Advertise the business	4 weeks	8
11. Open the doors of club to customers	1 weeks	8,9,10
TOTAL	16-50 weeks	

Figure 1. Schedule of task

The Gantt chart constructed on basis of critical path method that is presented in Figures 2 and 3, allows us to see more clearly the time we need to perform each action. It will be divided by the number of weeks, and in cases where the duration of process is variable, I will set a range of estimated time.

Possible risks

Troubles that will arise during the process possibly will retard the implementation of the actions, due to difficulties in finding information, slowness of bureaucratic processes or the tune up of the facility. We have to find ways to reduce these risks by using the previous analysis performed in feasibility plan.

In opening tennis club process the following risks can occur:

- ✓ *Privacy of some information.* It will difficult and retard the development of forecasts and feasibility plan.

- ✓ *Disposition the capital needed.* Otherwise, it would be necessary to borrow from the bank, a fact that will be analysed in feasibility plan previously.

- ✓ *State of facilities.* This can substantially increase the time required to open the club to customers.

The risks can be reduced in the following ways:

- ✓ Know different information sources in order to have alternatives in the collection of information.

- ✓ Perform feasibility plan as detailed and accurate as possible, contemplating future problems that may arise.

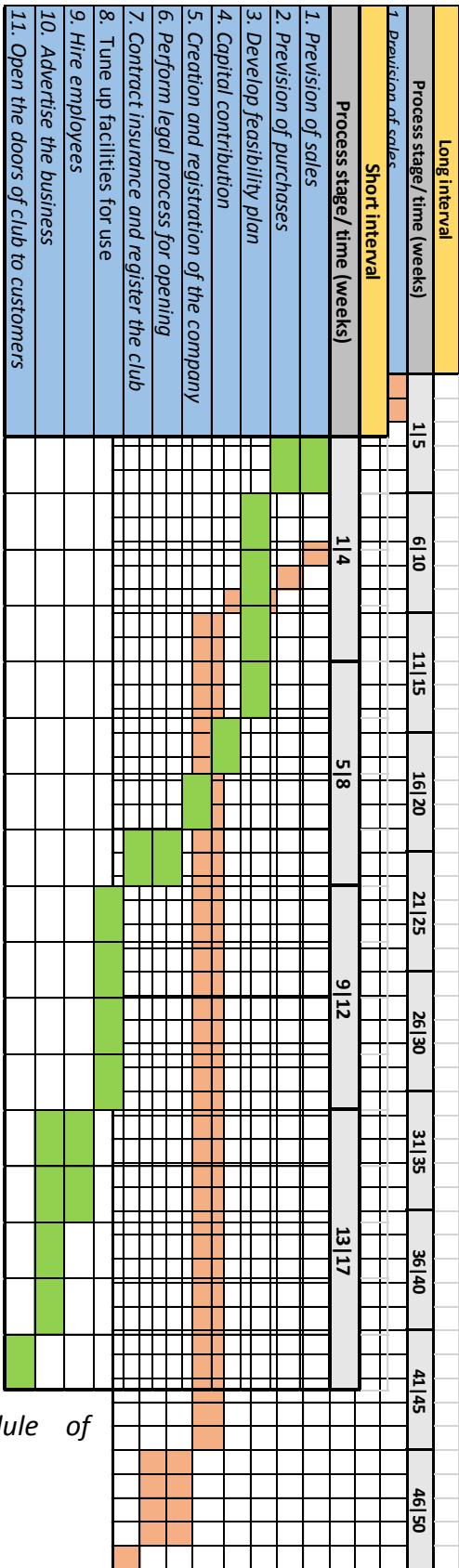


Figure 2. Schedule of

task

Figure 3. Schedule of task

2. How would you persuade your new (in the future, after you start to work) colleagues, that CC project management methodology might be suitable for the project management? Can you define basic CC benefits?

Critical chain method offers many benefits to the projects; allows to improve business management and optimize it to get the maximum benefit possible and in the shortest possible time.

Critical Chain management:

2.1. Provides a General View of the project

This method allows us to know how the business is evolving and if it fits, or not, to forecasts made previously. It also helps identify and prevent the problems that may occur in the future, greatly facilitating their resolution.

2.2. Planning and control processes

It is a very useful method to control in which position is your business and know, by the forecasts, what can happen in the near future. Also enables control of operations and the development of these, according to the scheduled time and the correlation between them.

2.3. Reduces multi-tasking

Preventing multitasking enables us to keep more precise control of operations, knowing at any moment which operations have to be done and which have to wait, always prioritizing the importance of these. This will allow us to reduce costs and efficiency when performing tasks.

2.4. Remove bottlenecks to resolve constraints

Facilitates the resolution of problems arising from business activity thanks to the forethought of these and the possible solutions offered. It helps greatly reduce the time needed to solve problems, as well as the efficiency when you have to solve them.

3. What kind of effects do you expect by possible using buffers (time buffers) during the working out of your thesis (dissertation)? Can you explain what the buffer is?

Buffer is a designed reserve of time applied to project schedule.

The buffers enables cope with the delays that may occur to the carrying out the project and thus keep the due date thereof. It also allows to know before the problems that can be given in the future, offering a wider range of time to resolve it. We could say that the buffers are very important for the realization of projects.

In my project I will use buffers after activities that can cause more problems. I will assign a week of margin to perform feasibility plan (Activity 3), another week of margin to complete the development of the facility (if you have not do them new) (Activity 8) and another week before the opening club, to buff the last details (Activity 11). The Final Gantt chart with buffers is presented on Figure 4.

Short interval with buffers															
Process stage/ time (weeks)		1 4		5 8		9 12		13 17		18 20					
1. Prevision of sales															
2. Prevision of purchases															
3. Develop feasibility plan															
4. Capital contribution															
5. Creation and registration of the company															
6. Perform legal process for opening															
7. Contract insurance and register the club															
8. Tune up facilities for use															
9. Hire employees															
10. Advertise the business															
11. Open the doors of club to customers															

Figure 4. Schedule of task

4. Can you specify by use of Thinking Process Tools. Your personal bottleneck as far as studying processes or writing a work or working on assigned school tasks (by other tutors) is concerned? Try to use CRT – Current Reality Tree and create a list of Undesirable Effects (named by you).

The thinking process, that is included in Theory of Constraints, is very important for business, allows to improve the efficiency of it, as well as the resolution of the problems in the shortest possible time.

Current Reality Tree shows the various unwanted effects that may occur and cause-effect relationship between them. Helps to analyse the problems, and focus in the most important.

Undesirable effects (UDE)

- 1) Problems in search for information
- 2) Poor quality and delays of feasibility plan
- 3) Loss of motivation
- 4) Slowness of bureaucratic processes
- 5) Bad weather conditions
- 6) Delay in the tuning of facilities
- 7) Issues when finding the right workers
- 8) Project with bugs and little worked

The Current Reality Tree constructed through these undesirable effects could be:

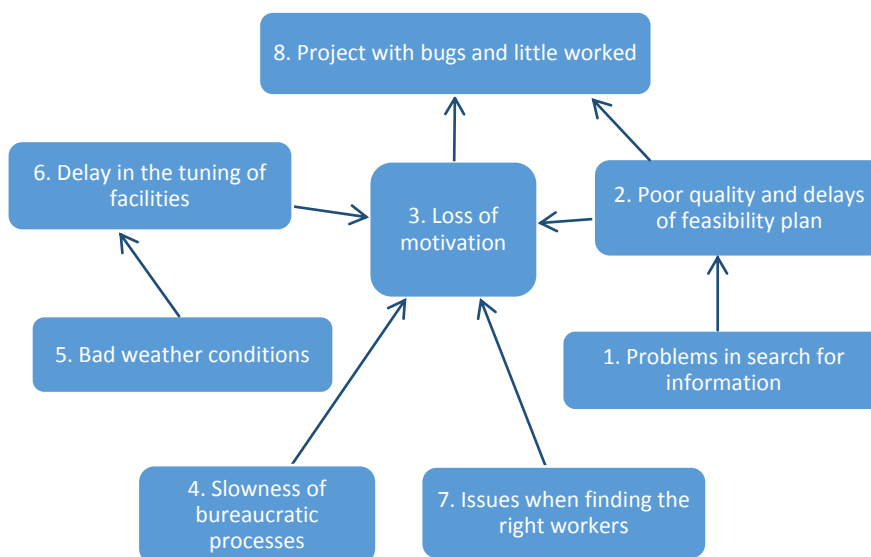


Figure 5. Current reality tree

5. State clearly your suggestions to improve your dissertation writing (project management question) and related benefits.

The improvements I would introduce, deduced from the Theory of Constraints and Critical Chain tools, are shown below:

- ✓ Identify in advance the problems or operations that are potentially dangerous.
- ✓ Create a Gant chart (Figure 2 and 3) detailed and accurate using Critical Chain tools.
- ✓ Deal efficiently to delays that may occur in the operations. Reflected in Gantt chart with buffers (Figure 4).

Analysing all studies performed, including the list of undesirable effects and the current reality tree, we come to the conclusion that it is necessary to make some improvements in our system in order to optimize it. These improvements will be reflect on the Future reality tree (Figure 6), used to solve the problems listed in the Current reality tree (Figure 5).

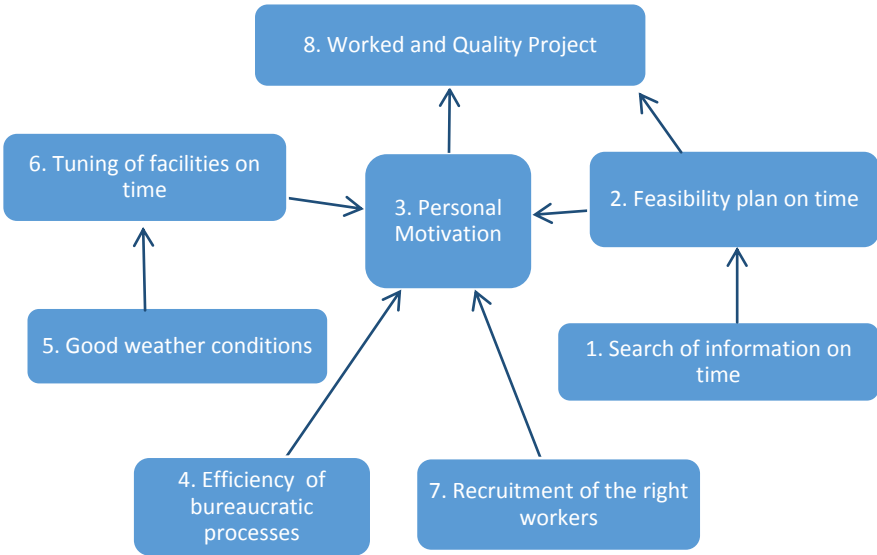


Figure 6. Future reality tree

Benefits

The improvements previously discussed can lead us to have many benefits when establishing the project. In my opinion, and in this particular business related with tennis, the most important benefits are:

- ✓ Perform a quality and detailed project.
- ✓ Optimizing the tune up of the business through good distribution of the available time.
- ✓ Start business with facilities in good condition.
- ✓ Progressive increase in the number of members, students and clients in general.
Future sustainability of the project.

