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A METHOD OF PREPARATION RESOURCE PLAN IN ERP-SYSTEM IMPLEMENTARTION PROJECTS BASED ON BENCHMARKING AND ESTIMATOR

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1. Introduction

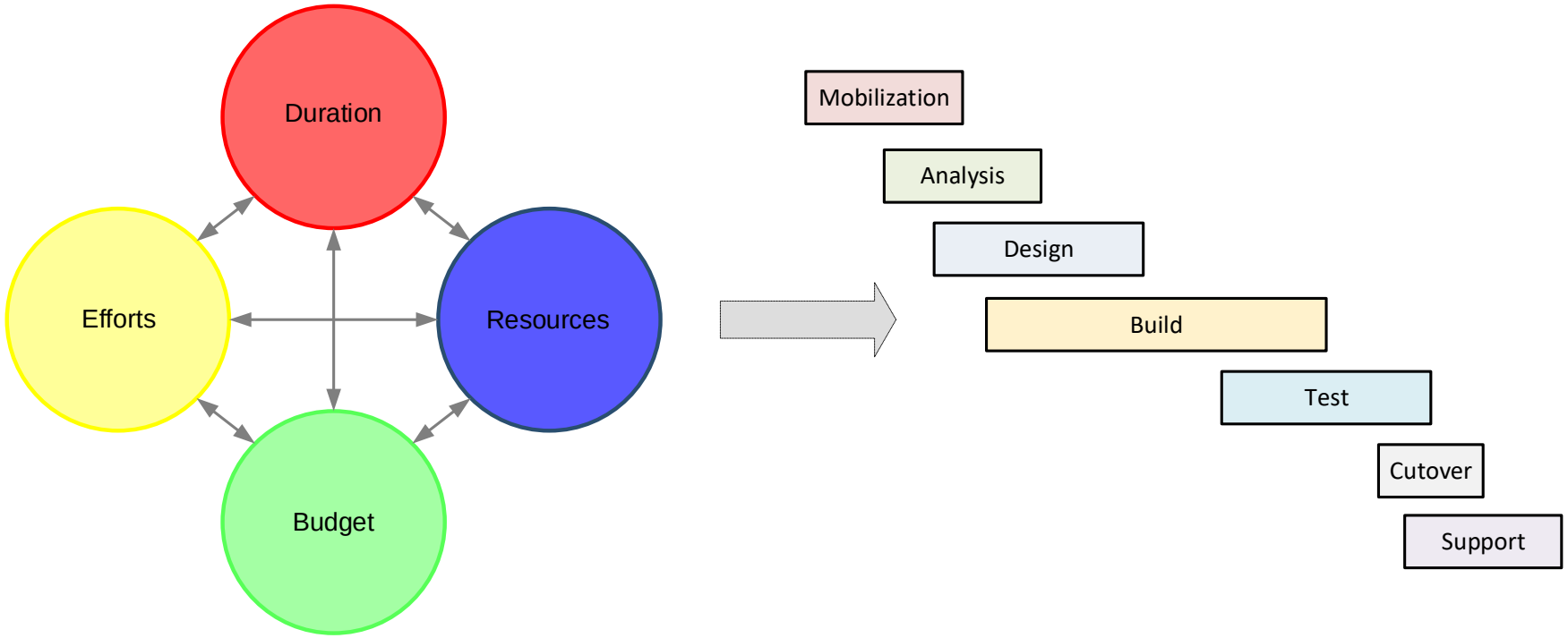

Fig. 1. ERP-project and it's essential parts:
efforts, duration, resources, budget

2. Problem statement

The goal of the paper is propose fast algorithm to shape resource plan for ERP-system implementation projects. Following tasks will be performed to achieve the goal:

– review existing approaches to shape resource plan;
– introduce estimator for software developments;
– describe benchmarking for ERP-system implementation stages;
– suggest algorithm to create resource plan quickly;
– compare existing approaches and proposed algorithm.

3.1. Overview of the methods to prepare resource plan (1 of 2)

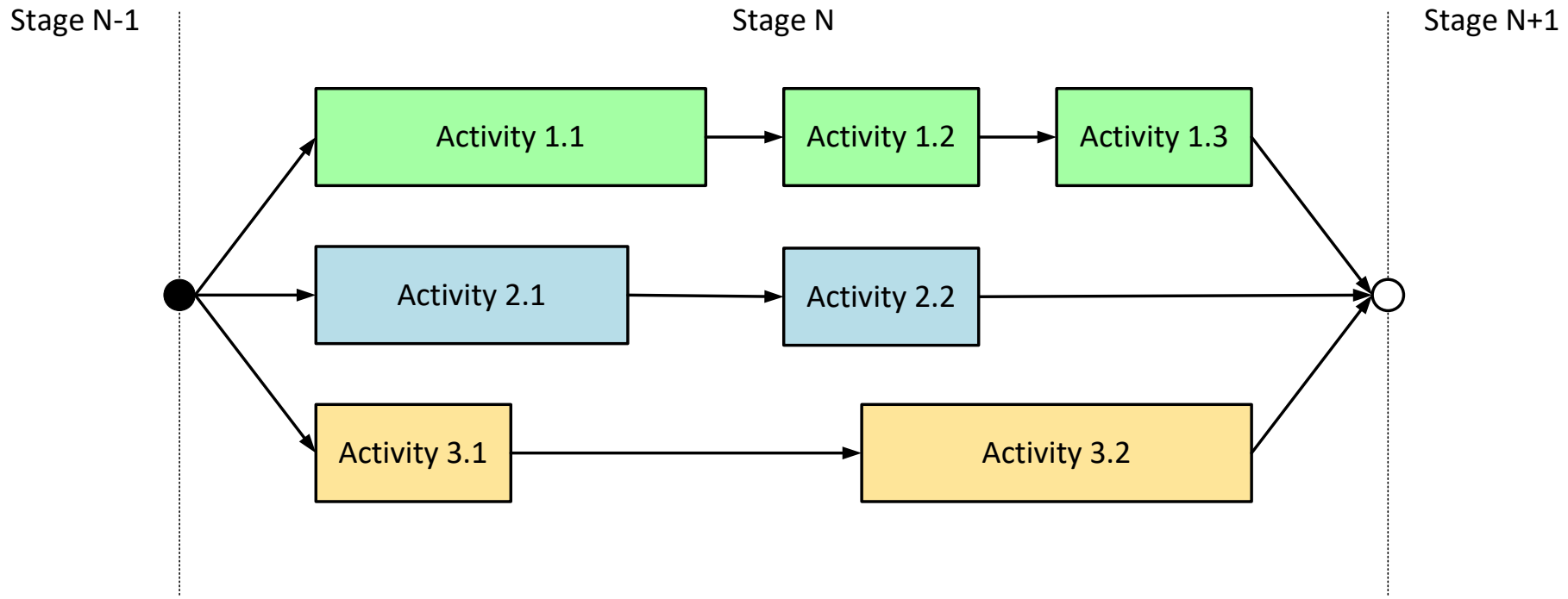

Fig. 2. Methods to calculate project duration:
critical path and critical chain

3.1. Overview of the methods to prepare resource plan (2 of 2)

Project	Stage	Analysis	Design		Build					Test		Cutover	Support
	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Dec	Jan
	Number of monthes	1	2				5			2		1	1
	Number of working days	11	19	19	21	18	21	21	21	21	20	20	11
Resource plan (%)	Project manager	100	100	80	80	80	80	80	80	60	60	50	30
	Logistics consultant	30	100	100	100	100	100	100	100	100	100	300	100
	Finance consultant	30	100	100	100	100	100	100	100	100	100	300	100
	ABAP consultant	0	0	0	100	200	300	200	200	100	100	100	50
	Data migration consultant	30	100	100	100	100	100	100	100	100	100	100	100
	Basis consultant	100	0	100	0	50	100	100	100	50	0	100	0
Efforts (man-days)	Project manager	11	19	15	17	14	17	17	17	13	12	10	3
	Logistics consultant	3	19	19	21	18	21	21	21	21	20	60	11
	Finance consultant	3	19	19	21	18	21	21	21	21	20	60	11
	ABAP consultant	0	0	0	21	36	63	42	42	21	20	20	6
	Data migration consultant	3	19	19	21	18	21	21	21	21	20	20	11
	Basis consultant	11	0	19	0	9	21	21	21	11	0	20	0

Fig. 3. Example of bottom-up approach to shape resource plan based on efforts

3.2. Overview of estimator to develop software

RICEF type	Complexity	Design efforts (man-days)	Build efforts (man-days)
Report	Very high	5	20
Report	High	4	15
Report	Medium	3,5	14
Report	Low	3	12

Fig. 4. Example of software development estimator

3.3. Overview of benchmarks for ERP-project stages

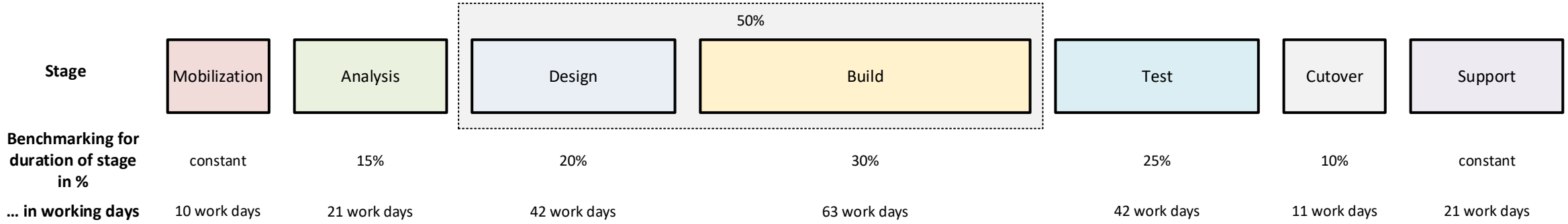

Fig. 5. Benchmarking of stages duration in % and working days

4.1. Implementing the algorithms to shape resource plan: linking project duration and efforts

$$\text{Duration} = \text{Efforts} / \text{Number of persons}, \quad (1)$$

where duration is a number days, efforts is man-days estimation required to perform a task, quantity of persons characterizes people, 100% dedicated for the project.

4.2. Implementing the algorithms to shape resource plan: proposed algorithm

1. Calculate the number of persons according to (1), where efforts are to be taken from estimator and duration is calculated based on benchmarking for the design stage. Align computed number of people with calendar. Thus, you have updated duration for the design phase also;
2. Do the same for the build stage, therefore you will find the number of human resources and duration for this stage;
3. Having calculated duration for the design and build stages, let's compute all other project phases using benchmarking. It will allow you to calculate duration of whole project;
4. Duplicate human resources from design and build stages to all other phases. However, there should be no developers at analysis stage. So, I have roughly built human resource plan.

4.3. Implementing the algorithms to shape resource plan: example of applying algorithm without optimization

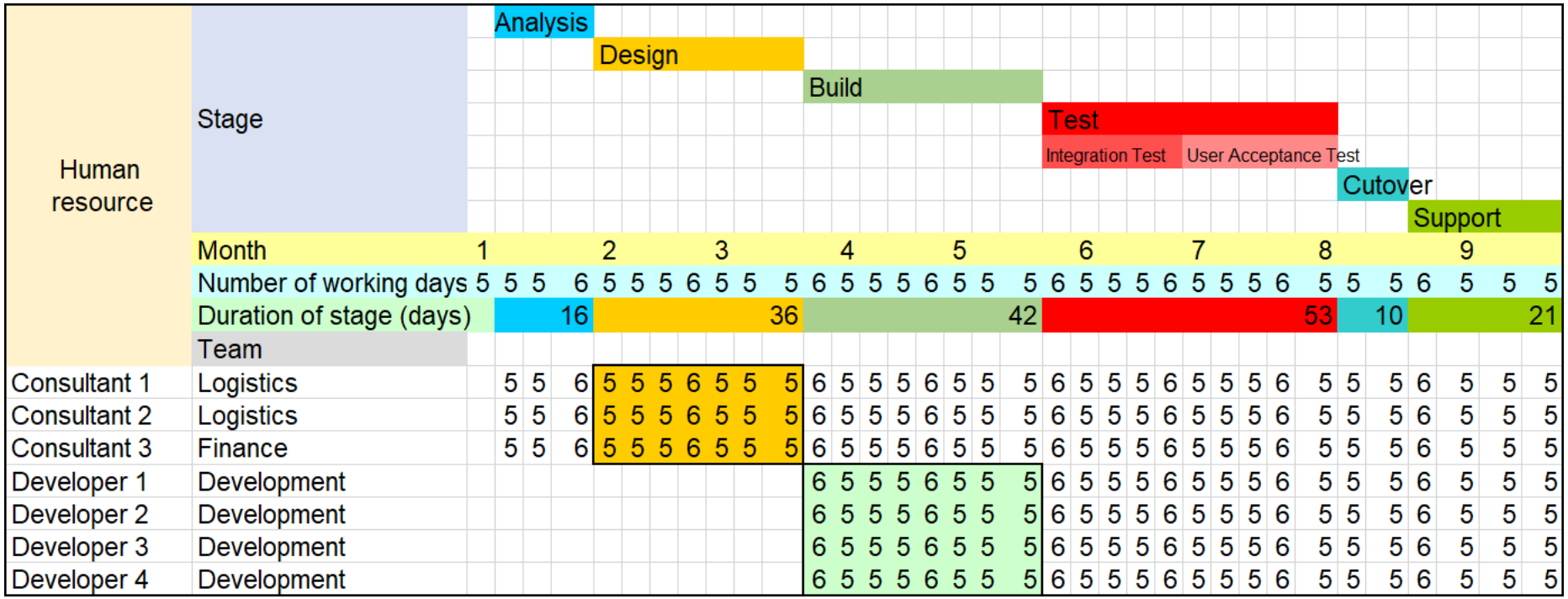

Fig. 6. Example of resource plan created based on proposed algorithm without optimization, total efforts are 1038 man-days

4.4. Implementing the algorithms to shape resource plan: example of applying algorithm with optimization

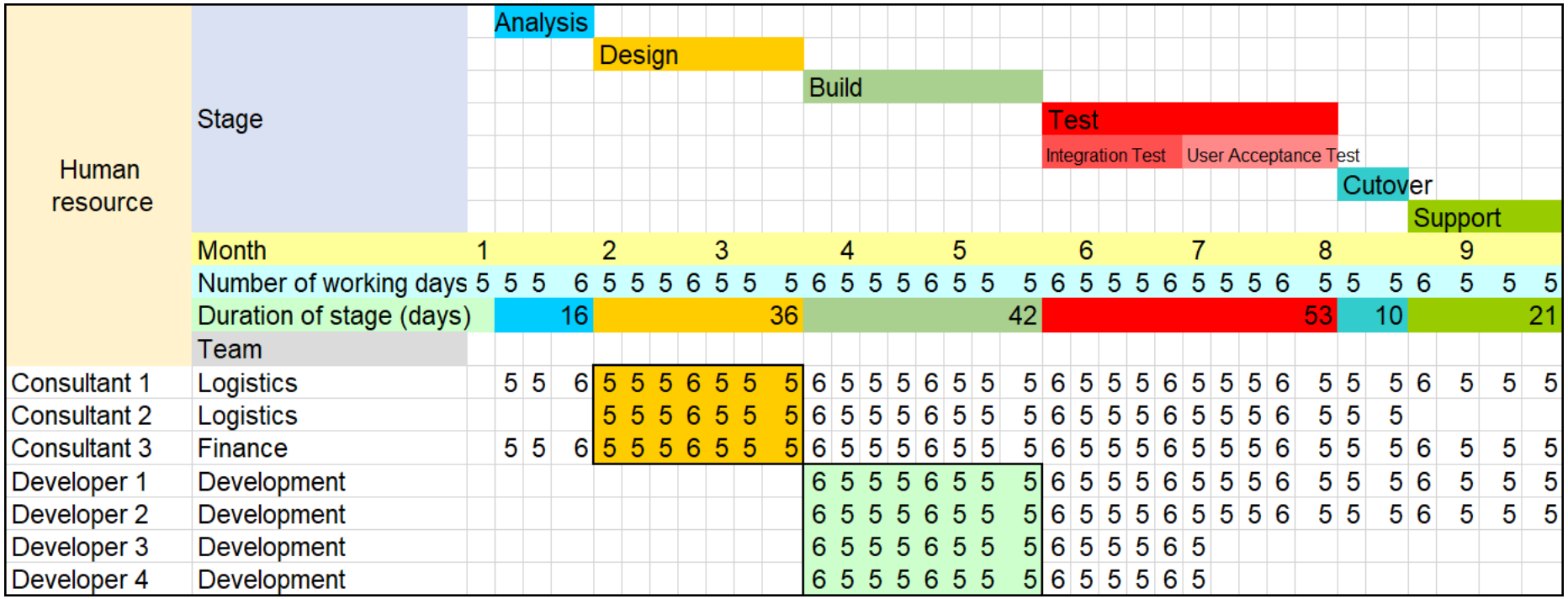

Fig. 7. Example of resource plan created based on proposed algorithm with optimization, total efforts are decreased to 887 man-days (15% less)

5. Comparison of algorithms

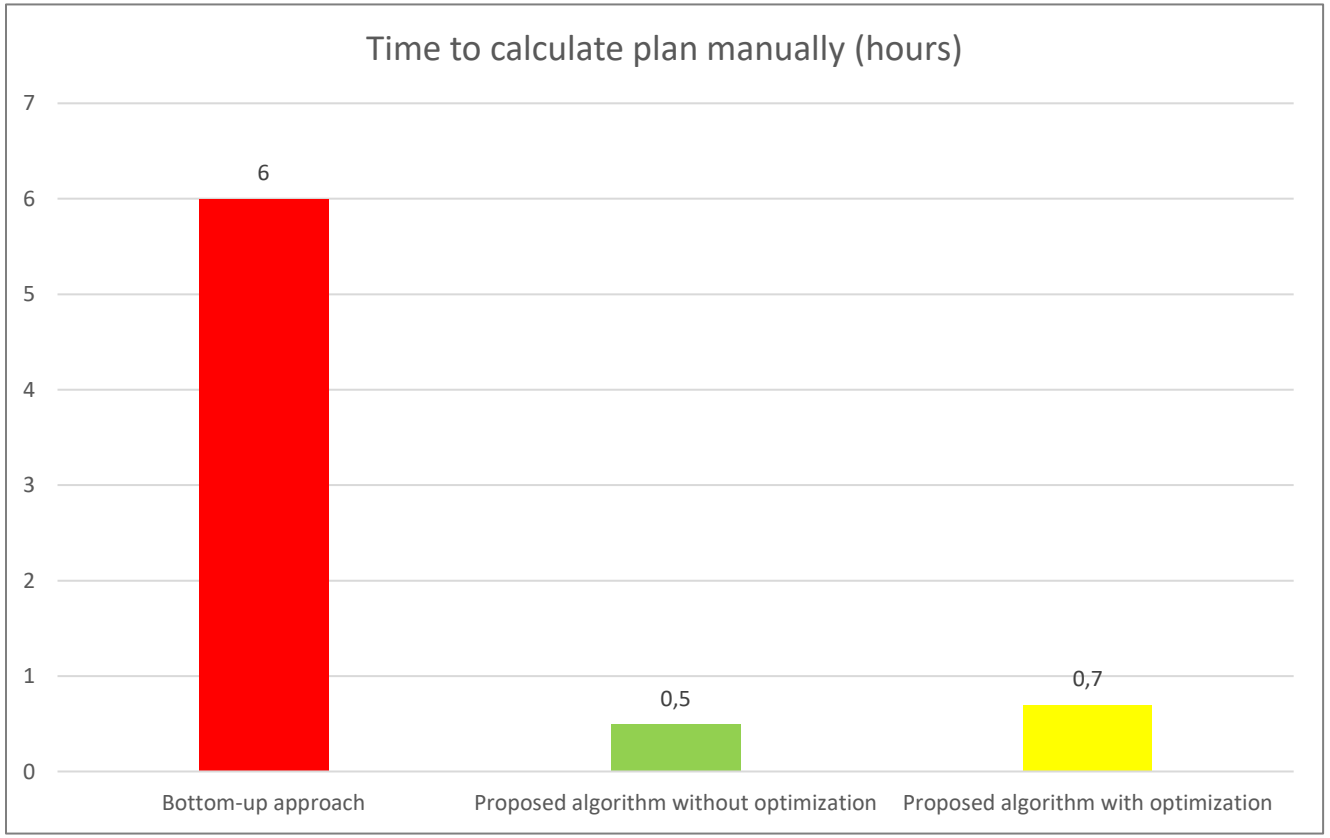

Fig. 8. Comparison of bottom-up approach and proposed algorithms

6. Conclusion

- The article suggests a method that allows you to quickly build an ERP-project resource plan, using planned efforts as input parameters for design as well as build stages. Proposed method is much quicker in comparison with existing bottom-up approach.
- The method ensures the creation of a human resource plan from the start date of the project. To form a plan from the end date of the project, it is necessary to reduce the duration of the design stage and increase the number of its human resources. At the same time, it should be considered that the shorter duration of the stage, the higher risk of the project failure, regardless of the increased number of resources.
- Further development of the method is clarifying the algorithm for reducing resources and including activities not related to design and build in the scope of the project.

Thank you!

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