Assignment clarification: Theory/ practice transfer paper

Matriculation number: 8240

Since you are developing a research question or a solution for your company, a comprehensive clarification of the assignment is mandatory and has three essential objectives:

- ✓ You will have a clear picture from the very beginning of the requirements and expectations of your company for your theory/practice transfer paper.
- ✓ The supervisors of your company know what output and thus which benefits they can expect from the transfer paper.
- ✓ NORDAKADEMIE can check whether your chosen topic appears consistent in itself, is realistic in its scope, and whether you can work on it successfully with the chosen means.

Please, answer the questions jointly with your company supervisor. As a guideline, the answers should comprise around two thousand characters.

What is your topic (the operational question/ research problem)?

Effective cold-storage of CI pipeline artifacts

How can pipeline artifacts be stored space efficiently given the operational constraints of CI systems and the access requirements that come with them.

What is the reason for the research question or problem?
How did the problem come to your attention and what has already been done?

CI pipelines generate vast amounts of log and error reporting data. Access to this data has to be ensured in order to effectively debug any issues in the codebase. This poses a conflict between storage optimizations and accessibility. Compressing files reduces the overall storage requirements but usually results in loss of random access and at the expense of computing resources. In order to make the right tradeoff, a better understanding of the options is required.

How does the research question or problem arise concretely in the workplace?
What does it mean that the question or problem has not yet been answered or solved?

One of our largest projects generates CI data in the order of terabytes per month. Keeping this data accessible and maintaining the underlying infrastructure (especially regarding I/O constraints) is becoming an increasing issue. Currently, only a rudimentary and deferred storage optimization takes place which to date can not counter the influx of data. A more efficient storage solution would allow a more efficient and cost effective operation.

Which objectives do you pursue with this theory/practice transfer paper?

Analysing the efficiency, speed and access options of different compression algorithms. Namely, compression ratio vs. CPU usage and the ability to randomly access archive contents.

How is the procedure for answering the posed research question/problem?
Which methods/materials will I use to find out/prove/test this?
What do I mainly want to do in my transfer paper: to argue? To analyse? To compare? To interpret? To test?

The performance analysis of the algorithms will be executed using empirical methods based on an exemplary dataset from the company. Feature analysis regarding random access will be performed using existing literature and specification documents from the respective algorithms.

☐ I hereby approve the topic and supervise the student during the development of the transfer paper:

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Signature, company supervisor

Afterwards, please upload the assignment clarification in CIS. You will receive information on whether your research question has been accepted within one week (calculated on working days). If the topic has been accepted by NORDAKADEMIE, the 4-week processing period starts. If your topic has been rejected, you will receive information about the reason for rejection and can upload the research question again, eg with a different focus or another planned procedure. This process can be repeated several times until the question has been accepted.