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| 1. **Name of the challenge** *(short, powerful and inspiring description):*

**In-memory database with the use of GPU** |
| 1. **Context*:*** *(what is the background information behind the challenge, what is the state of the art of the sectors, the role of the organization in this context, the target group to whom the solution need to be addressed, etc.)*

 To develop a database system that will store data in ab appropriate form and provide an interface for queries by means of basic SQL constructs. Database will be orientated at analytical applications generating live reports and where minimal answer response is required. Therefor the main feature of database is that data will be accessible in the RAM memory and query transactions will be executed with the use of graphical cards. |
| 1. **Problem:** (*What i*s *the problem that needs to be solved, why is important to solve, impact of this problem in the close future, impact of the problem on local or international area)*

The objective of the project will be a simplified database system that will be able to sore data in a suitable structure on the disc but because of the fast access they will be accessible in the operational memory as well. This core will be able to carry out some standard query functions (filtering,, aggregation functions), that will be computed on graphical card using the CUDA interface. Database will be capable of basic operations with geographical data, such as computation of events in a specific region. Apart from this there will be also an application for creation of interactive reports there, i.e. user will be able to simply create graphs and maps from the database data. Typical use case will be analytical report on visits to a selected place using telco data. An example: http://analyzy.marketlocator.sk/stcs/stc\_branches/1.html1. **Additional info (for internal use):**  *(what is expected to be delivered by the team (idea/concept/prototype), what are the specific tools & instruments that shall be used (eg. Programing language etc), what are the asset (as knowledge, materials) will be given to the team*

Current hot topic is data processing using a graphical card. Special real time queries are within big data context impossible to carry out over "standard" database systems and sometimes various optimized "nosql" solutions are not sufficient either. The performance of graphical cards makes possible to paralelize simple computations and thus accelerate big data processing and achieve the response time of queries within 1 second. |
| 1. **Skills of the team (for internal use):** *what specific skills shall the team have in order to address the challenge*

Oligatory: C++/C#, CUDA Linux, Useful knowledge areas: Architecture of information systems, Advanced database technologies, Data visualization. |
| **5. About the Seeker:****Instarea, s.r.o.** is a laboratory for innovative big data monetization ideas within the international Adastra group. Mentor: Ing. Peter Krátky, PhD. (Instarea, s.r.o.) |