

## **Memo on SQL vs. NO-SQL database in Innovative Technologies Car Park Guidance System**

This memo discusses the database issues of the Innovative Technologies car park Guidance Management System.

The requirements of the project describe the use of a SQL database for the system.

SQL is the language used for accessing a relational database such as Oracle, MySQL, or SQL Server.

SQL - Relational databases require a structure with defined attributes to hold the data. NoSQL databases allow free-flow operations.

Innovative Technologies uses MongoDB, which is a non-relational and NO-SQL database, for the management of its Guidance Management System for the following reasons:

### **1. Development:**

Our Architecture is based on oriented objects Application Programming Interface (API), and we use object-oriented programming that is easy to use and that provides flexibility and are working with new data types, structured, semi-structured, unstructured and polymorphic data, and massive volumes of it.

In addition, there is no standard for interfacing with No-SQL database. Each system presents different designs and capabilities for application development team. The maturity of the API can have major implications for the time and cost required to develop and maintain the underlying NoSQL system. For Innovative Technologies, No-SQL database make development faster, more reliable, and leaner.

### **2. Performance and hardware:**

No-SQL database are failure tolerant. This means that in case of power outage for example, the recovery is immediate without latency an indexation of the base, that point is essential for a real time application.

Innovative Technologies uses single core industrial servers, low power, no heating and SSD memory. This allows to decrease the complexity of the hardware and as a result to decrease the failure risks.

With such machines, we can afford to reach 1000 records / per second for a No-SQL database. For an SQL database, it would necessary to use 4-core machines, no-fault UPS and a cooling system.

### **3. Technical proposal for this project:**

In order to respect the choice of the engineering consulting firm to have a SQL Database as MySQL, we can propose to have on the server a redundant database in a SQL format.

This database will be automatically replicated. So, the users will be able to perform queries in the SQL format.

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