

# TINTIN: A Tool for INcremental INtegrity checking

**A tool for efficiently implementing business rules validation, in any database system, to ensure the quality of the data.**

## The Challenge

Nowadays, data is gaining more importance than ever. For instance, data is driving the decisions of the business world (Business Intelligence), it is capturing the production state of the Industry (Industry 4.0), it is essential for automatizing administration (digital administration), and it is the key for new trends affecting our lives (from Smart mobility, to digital Healthcare).

Still, ensuring the quality of the data is a manual process. That is, engineers from all the previous domains, in order to guarantee whether their data complies with any business rules, must spend time and dedication to manually creating validation processes for such rules. This is a time-consuming and error prone task that is increasing the costs of producing any software, when not compromising its quality, over the whole world, affecting, among others, all the previous cited sectors.

## The Technology

TINTIN is a tool for automatically ensuring the quality of the data, by means of efficiently checking that it complies with the required business rules, without programmatic efforts.

On the one hand, TINTIN creates a code that captures user updates. On the other, it rewrites the business rules into queries that join the captured updates. In this way, TINTIN builds incremental queries: that is, queries that only take into account the last update applied to check whether some business rule has been violated. This incremental capability is the key for ensuring the efficiency of TINTIN.

## Innovative advantages

- **Efficiency:** the revalidation of the business rules is only applied when some data update might violate them. Furthermore, it only revalidates the rule that can have been violated, and only for the modified part of the data that may affect it.
- **Full automation:** users of the tool only need to write the business rules that data must satisfy, and the tool automatically generates all the necessary code.

## Current stage of development

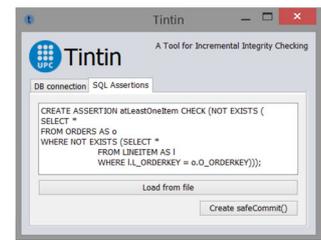
Right now, TINTIN is a proof of concept tool that reads a set of business rules that data must satisfy, currently specified as SQL assertions, and generates some code, currently under the form of SQL triggers and procedures, that automatically guarantees that any update on the data satisfies the constraints. All the code generated is automatically installed in the database without human intervention.

## Applications and Target Market

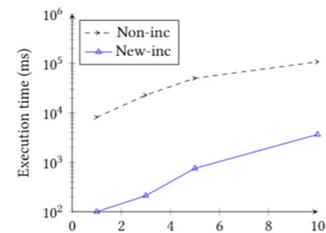
- **Applicable to any domain:** any industrial sector using data can benefit from it. E.g.: Business Intelligence, Industry 4.0, digital administration, Smart mobility, Smart healthcare, etc.
- **Applicable to any database system:** the technology can be adapted to any system providing first-order queries (e.g. queries similar to SQL or SPARQL).

## Reference number

MKT20210187\_I



**Users write the business rules to validate into TINTIN**



**TINTIN revalidation is faster, by orders of magnitude, than manually revalidating the whole assertion**

## Business Opportunity

Technology available for licensing with technical cooperation

## Patent Status

Priority application

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