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Identifying Indicators to Assess and Monitor Data Integration Engines Systems

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Abstract. We aimed to identify relevant indicators for end-users in integration engines for healthcare systems. Methods: The study was performed in two steps, including interviews and the identification of additional indicators from the literature. Results: 10 interviews were performed and 90 indicators identified. Discussion: Several of the indicators are difficult to calculate, nevertheless, they have the potential to improve data quality and processes in healthcare institutions and should be further explored in future studies.

Keywords. Integration, indicators, interoperability

1. Introduction

Integration engines are critical in the transmission of clinical and demographic data, maintaining accessibility and integrity within healthcare institutions worldwide [1].
Indicators to assess and monitor data integration engines are essential, contributing both to improve data quality and to facilitate systems management [2].
This study aims to identify relevant performance indicators for end-users regarding the implementation of integration engines.

2. Methods

Data were collected using a 2-step exploratory qualitative approach. The first step was an individual interview with expert professionals from health institutions/health companies that used health information systems daily/almost daily. They were asked to identify indicators within four pre-selected relevant classes of indicators (identified by the authors based on literature review and personal expertise): Information System integration, Data quality, Performance, and Safety and General Data Protection Regulation (GDPR). Two new categories were identified during the interviews: Integration Management and Hospital workflow process. The second step was the identification of additional indicators from the literature [3,4].

3. Results

We performed 10 interviews and identified 63 indicators. Additional indicators (n=27) were identified in the reports. Table 1 presents a sample of the identified indicators by domain. A list of all indicators (n=90) is available at http://shorturl.at/sIV28.

Table 1. Indicators concerning integrated software systems per domain; only a sample is presented.

Information System integration	● Absolute n of messages delivered / n sent	● Calculate n of alerts by period of time
Data quality	● Data availability	● Total messaging problems
Performance	● Delivery/receiving time	● N of SLA metrics for integration
Safety and GDPR	● Access history checking	● Key expiration time
Integration Management	● N of integration problems	● N of hours to set up/manage
Hospital work process indicators	● Number of coding errors	● Process reengineering

N – number; SLA – Service Level Agreement; GDPR – General Data Protection Regulation

4. Discussion

We believe that this study describes a relevant list of indicators that should be assessed and promoted within an integrated health system. Although several of the indicators are difficult to compute, they might contribute to improve data quality and processes in healthcare institutions, by promoting the identification and facilitating the correction of system inefficiencies or malfunctions, and should be further explored in future studies.

5. Conclusion

This study identified 90 indicators that can be analyzed by actors involved in the healthcare system and have the potential to contribute to data quality improvement.

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