

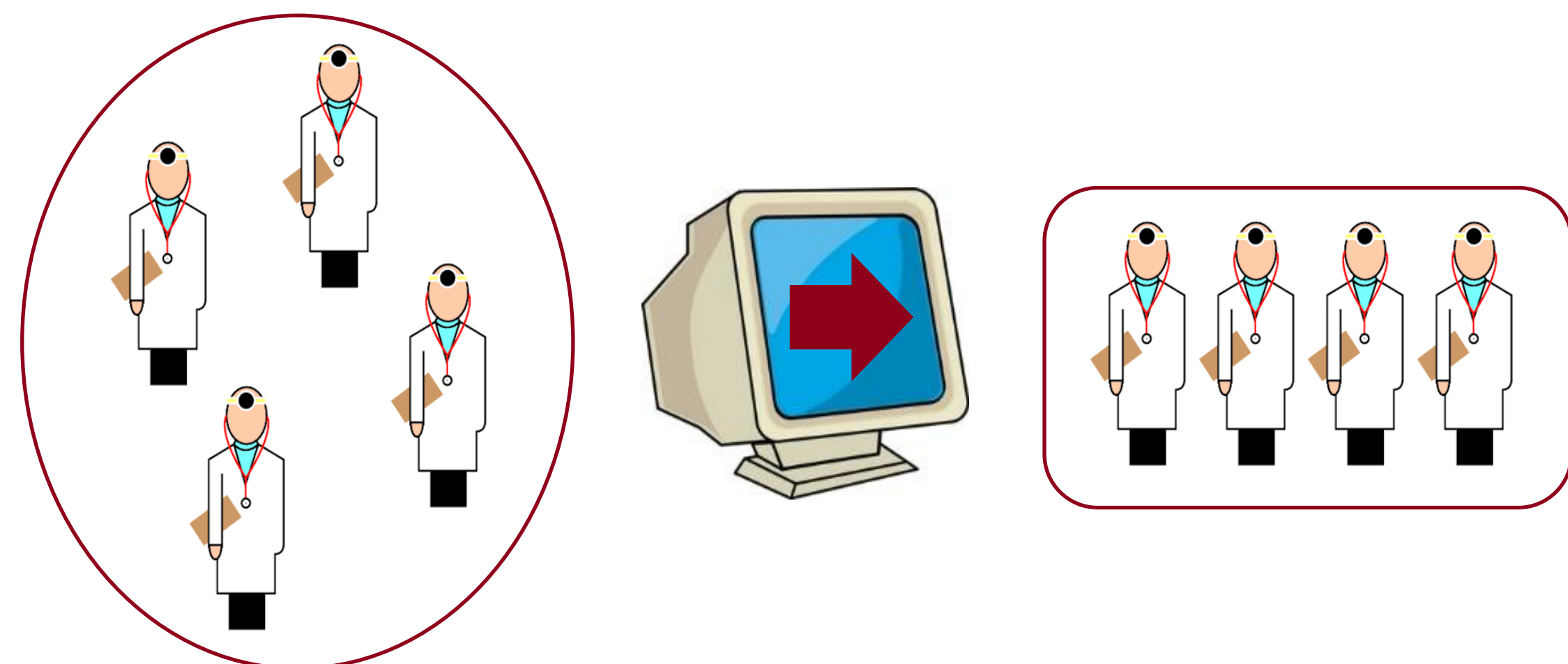
Extent of use of business analytics in healthcare

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Introduction

Business analytics (BA) is an application of the models of operations research, operations management, and statistics, providing insights into business operations using both past performance data and statistical predictions of future performance. BA helps to find optimal or good answers to common management questions. Without BA, these decisions are made on non-quantitative grounds, generating avoidable costs, performance failures, or other inefficiencies.

The purpose of this work is to conduct a semi-systematic review of the literature on potential and actual applications of BA in healthcare. Specifically, this review will focus of the problems of scheduling (of operating rooms and personnel), assignment of test specimens to pathologists, and managing patient flows (through emergency rooms, testing services, etc.). As a result of this review, it will be possible to draw conclusions about the pervasiveness of BA application in healthcare and to identify potential areas for improvement.



Methods

Five databases from a variety of fields were searched using a single query, which is outlined below. PubMed and PubMed Health provided articles from the perspective of healthcare, and ABI/INFORM Global provided articles from the perspective of business. Because the theories underlying BA techniques have their roots in computer science, Compendex and INSPEC were also searched.

The search results were then filtered as is shown in the Results section.

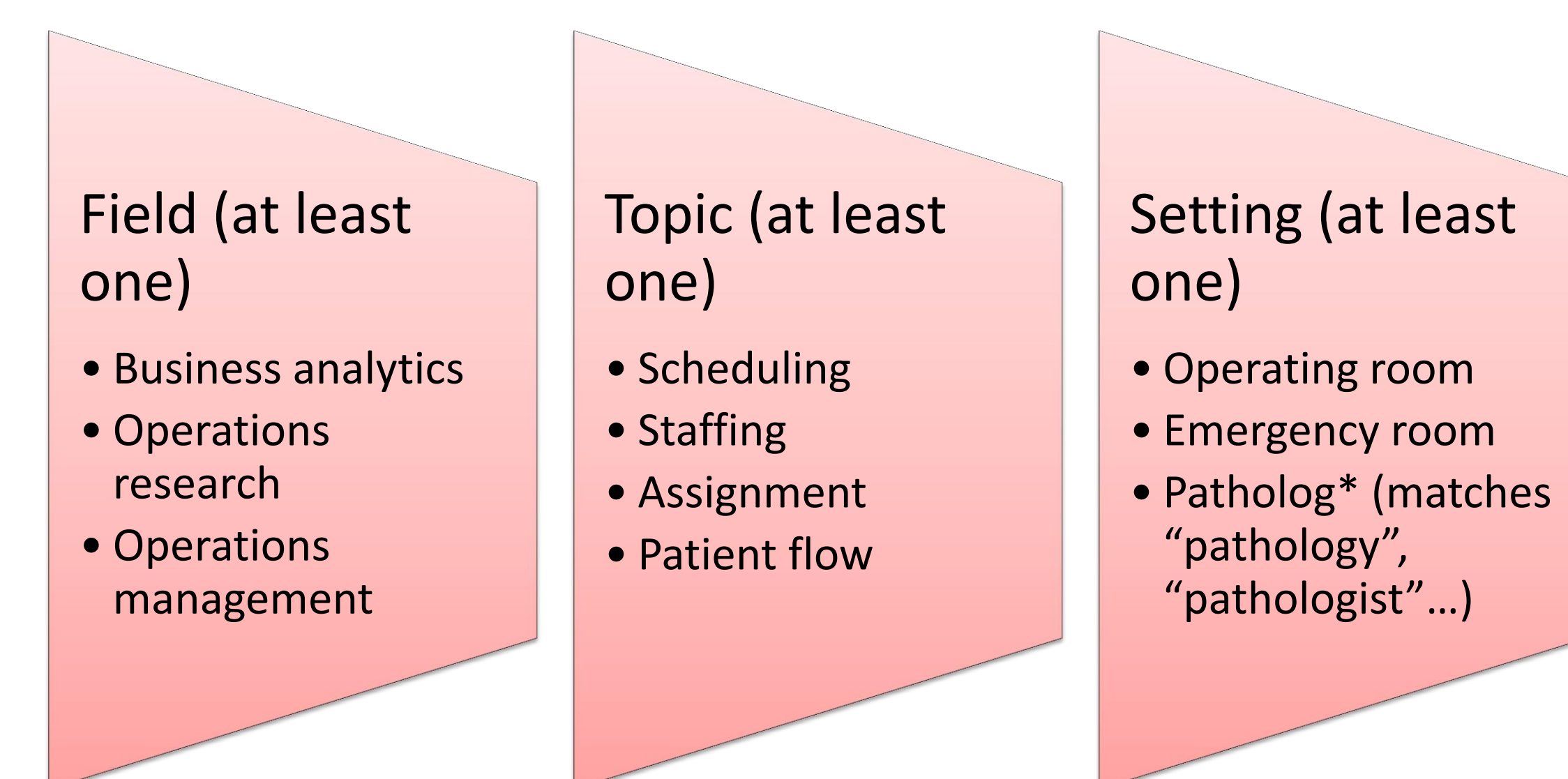
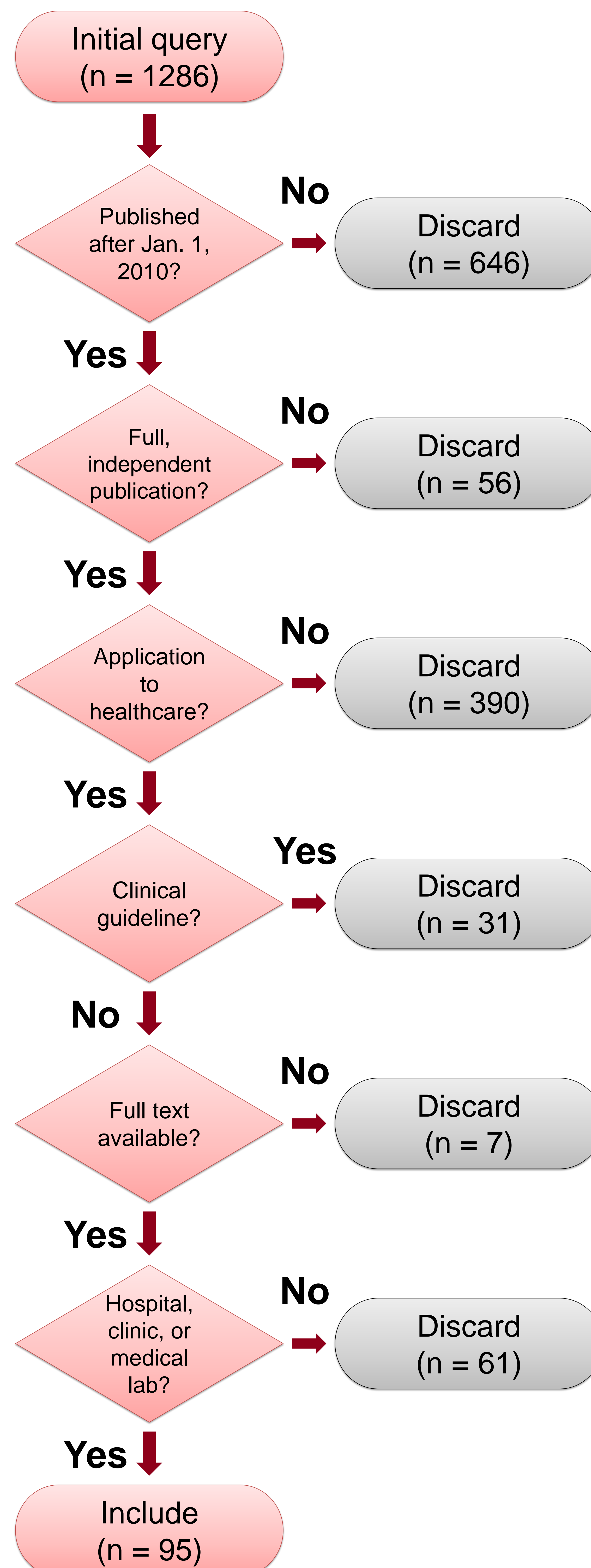


Fig. 1: Visual representation of search query
 (((("business analytics" OR "operations research") OR "operations management")) AND ("scheduling" OR "staffing" OR "assignment" OR "patient flow")) AND (("operating room" OR "emergency room") OR "patholog*"))

Results



Conclusions

Though many articles were found that proposed mathematical models for optimizing various aspects of healthcare operations, few of them were stated to have made the jump to actual practice. From the other side, several articles described real instances of problems that could have been solved efficiently by BA but were instead tackled using inferior methods, ranging from the management fad of (Lean) Six Sigma to bald-faced rules of thumb and expert opinions.

As for the subtopics of interest, operating rooms and emergency rooms had been given a great deal of attention from the theoretical literature, as had other patient flows to a lesser extent; pathology and the medical lab were rarely mentioned. The non-theoretical articles were generally too wide in scope to relate specifically to the chosen subtopics, but also tended to address the hospital or clinic and not the medical lab.

In short, while the theoretical progress in healthcare-related BA is excellent, its practical application leaves much to be desired.

References

This project was a literature review and makes reference to 95 sources, not all of which can legibly fit on this poster. Below is a sample of those references.

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