

# An Integrated Approach towards Performance-based Funds Distribution: Leveraging a Research Information System across Institutional Boundaries

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## Summary

Performance-based allocation of academic resources is increasingly gaining ground. Related data collection methods are, however, often either labour-intensive or prone to inaccuracies. A platform for the collection and evaluation of performance data should provide a comprehensive coverage, minimize data-collection effort, integrate trusted data sources for verification and provide flexible and transparent analysis functions. The EVALuna Biblio system was developed and initially rolled out in the medical community to implement these requirements. Since 2005 a total of 96,000 publications were gathered by more than 1,300 users at the participating institutions. Ease-of-use and transparency were decisive factors in the platform's success.

## 1 Introduction

An increasing amount of the overall academic funding is distributed using performance-based metrics. At some faculties the full internal budget is depending on outcome measures like bibliometric factors, extramural funding or structural data like headcounts. In 2007 e.g. 15% of the Bavarian public funding for the five university hospitals (63.5 Mio. EUR), were allocated by means of academic performance indicators. Thereof 37.375 Mio. EUR were based on research-related parameters (14.375 Mio EUR for the publication record and 23 Mio. EUR for the successful acquisition of extramural funding for research projects). At the Erlangen University Hospital the local budgets for research and teaching are by now fully performance-based. In 2007 an amount of 15.896 Mio. EUR were allocated by means of research parameters, thereof nearly 10.5 Mio. EUR by measures for publications and extramural funding.

10% of the 2007 public funding for the seven University hospitals in North-Rhine Westphalia (57.43 Mio. EUR) were allocated by performance-based indicators. Thereof 43.075 Mio. EUR (75%) were allocated for research parameters (25.845 Mio. EUR (45%) for the publication record and 17.23 Mio. EUR (30%) for the successful acquisition of extramural funding for research projects). At the Münster university hospital about 25% of the 2007 local budgets for research and teaching were allocated based on performance indicators. These examples illustrate the rising importance of performance-based resource allocation.

tion and highlight the need for an accurate and timely factual database to support these funding decisions.

Often, however, the information for resource allocation is provided by the institutions themselves, without external review. In other cases, measures are provided by central authorities who rely on database extractions without feedback from the scientists themselves. Both approaches are labour-intensive and bear the risk of an incomplete or mis-coverage of the field-of-interest. In order to ensure a high standard of data acquisition, trusted sources and an external validation should be mandatory.

Datasets and analysis requirements vary widely between the states, which need standardized benchmarks carried out identically between institutions, and individual faculties, which need adaptable reports for internal performance-based funding (PBF) and ad-hoc strategic decisions.

Therefore, a platform to support PBF should provide the following features:

- ensure comprehensive and accurate coverage of the field-of-interest
- minimize the effort needed for data collection
- integrate trusted data sources for validation and provisioning of performance measures
- provide flexible and transparent analyses for state-wide benchmarking as well as ad-hoc strategic reporting

## 2 Methods

The EVALuna Biblio platform was implemented to combine individualized data entry by the participating institutions with centralized analysis capabilities covering both the needs of state-wide standardized funds-distribution schemes as well as ad-hoc queries by individual institutions. The system focused initially on publication-based data for medical faculties. A direct interface to the Medline database and file-based import functions for the ISI Web of Science and standard literature management tools were implemented to facilitate data entry into the system. A repository for bibliometric data was added to provide flexible linking of both journal- and publication based measures acquired from commercial vendors like Thomson ISI. An export interface was provided to enable the subsequent use of the acquired data for further purposes.

An analysis function was implemented to enable flexible evaluations in which each attribute of the acquired publications could be used for filtering and aggregation of relevant bibliometric measures.

## 3 Results

The EVALuna Biblio platform was rolled out in 2005 and is currently in productive use at 11 medical faculties in 2 German states. More than 96,000 publications have been imported into the system by over 1,300 users at 714 participating institutions. Following a brief instruction, users achieved high levels of productivity: Overall, 29,400 sessions were logged which lasted for an average of 25 minutes (1 min - 9.4 hours). Users performed an average of 59 actions within a session. The peak data entry rate at a single faculty reached up to 1,000 publications per day.

Two state-wide standardized benchmark analyses were implemented as well as 14 additional local evaluations for internal resource allocation. For ad-hoc reporting and strategic decision-making, additional local reports were generated at all participating faculties by exporting data into standard tools (e.g. Microsoft Excel) for further analysis. Subsequent use of exported data was observed down to the level of departments or researchers for individual purposes like grant proposals. Users were able to instantly assess the effect of each publication on the overall measures derived from the whole dataset. Starting from an aggregated bibliometric measure, users could drill down to determine the individual publications included.

## 4 Discussion and Outlook

EVALuna Biblio has been established as a very well-accepted platform for the acquisition and standardized analysis of benchmarking parameters by 11 medical faculties in the German states of Bavaria and North-Rhine Westphalia. The major factors for this success were the ease-of-use and high productivity of the system as well as the transparency and flexibility of the integrated analysis functions. The immediate feedback on a publication's impact on the outcome measures as well as the possibility to drill down from an aggregated figure to each individual publication helped users to achieve both a comprehensive dataset as well as a high confidence into the validity of the results.

Work is currently being carried out to include further scientific parameters like extramural funding and additional publication types into the data acquisition module. Also, data analysis is being extended to support evaluation by research topics or working groups and individuals based on a broad dataset.

For further uses of the comprehensive data acquired during the project it is being considered to extend the system by collaborative functions allowing users to share information and resources.

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