Research intelligence and performance management

Nick Fowler, **John Green**, **Scott Rutherford**, and **Thomas Turner** summarise the findings of their recent study, which identifies potential solutions to the issues surrounding the development of research intelligence and performance management systems.

Within universities, there is growing recognition of the need for research intelligence and performance management frameworks. These frameworks can focus institutional strategies on research quality, raise the profile of an institution's research, manage talent, and build a high-quality research environment. However, there appears to be dissatisfaction with the data and tools available to integrate information from disparate systems, and a frustration that different stakeholders – including funders – demand similar information in different formats. Institutions implement their own solutions, with few examples of successful collaborative approaches within or outside the sector. This leads to inefficiency overall.

This article summarises two areas from a JISC-funded study, conducted in 2010 by Imperial College London and Elsevier, on how research information can be used to develop performance management, and what research information might ideally be delivered.

Methodology

The study was limited to English institutions. Of the 110 higher education institutions considered research active[1], a sample of roughly 20% was deemed sufficient to give confidence in the statistical significance of any cross-sector conclusions. The 24 institutions approached to take part were specifically selected to achieve a representative cross-section in terms of:

- total turnover
- amount of externally sponsored research income
- geographic location

A range of staff involved in research were interviewed, including senior academics – such as pro vice-chancellors for research (PVCRs), directors of research offices, systems and IT staff, and research office staff. The interviews were led by staff from Imperial College London, alongside Elsevier personnel, and lasted between 1.5 and 2.5 hours. Interviews were conducted in a semi-structured format, based on a standard topic list.

Findings: performance management

There was general acknowledgement of the need for data to manage performance, but confusion and contention about the implications of collecting, let alone disseminating, such data. The sensitivity came from a belief that academic values – such as curiosity-driven research – are independent of, even at odds with, management values such as accountability for performance. Many were concerned about data collected on individuals, yet acknowledged that aggregate data inevitably had to be constructed from data about individuals. As the following representative quotation illustrates, there was an underlying fear that individual data would be used to judge academic performance:

'Academia is based on stochastic processes and a dashboard at an individual level would be a disaster.'

The reasons given for needing reliable data at an aggregate level (theme, department, etc.) were agreed as:

Strategy	Research strategy developed using internal and external research data
	Senior academic team used research data to identify strengths and weaknesses
	Research income targets and milestones incorporated into research strategy
Execution	Strong emphasis on evidence-based decision making by vice-chancellor
	Key performance indicators set at faculty level, and progress reviewed monthly by vice-chancellor and heads of faculty
	Individual level targets set by heads of faculty and reviewed against external peers
	Performance against targets and feedback fed into annual appraisal mechanism
Results	Individual level review is not mandatory, but take-up is high (c100% across institution)
	RAE 2001 to RAE 2008 performance = +6 places
	Research income growth (2005 to 2008) = +59%
	Research income growth ranking (2005 to 2008) = +18 places

Figure 1: Case study – delivering results through performance management

- To inform decisions in a context of increased competition and complexity (e.g. interdisciplinarity)
- To inform and evaluate research strategies, which are gaining increasing attention
- To meet statutory reporting and submission requirements (e.g. of the Research Excellence Framework (REF), the Higher Education Statistics Agency (HESA), and funding organisations)

Despite these common needs, the appetite for using data to manage individual academics varied. However, at the several institutions that used clear frameworks for performance management, research income and reputation had improved markedly, as measured by recognised performance and league tables. The consistent factors that contributed to this success are identified in Figure 1.

At one especially successful institution, the PVCR and the director of the research office regularly discussed success rates and the volume of applications and awards. Information was provided at institution, faculty, and departmental levels, with the ability to drill down to individual level when needed. A framework existed for the PVCR to discuss objectives with deans, and to use information with research facilitators to match academics' strengths to funding opportunities. At this institution, there were clear institutional and discipline-specific benchmarks: for example, that grant income be in the top ten of the appropriate Research Assessment Exercise (RAE) unit of assessment.

Institutions repeatedly mentioned the difficulty in securing meaningful, up-to-date information related to comparator institutions. Where benchmarking data was available, it was not structured consistently, published regularly, or available in meaningful formats. As a result, some institutions shared data between small peer groups in an effort to generate benchmarks. However, such moves were relatively informal or ad hoc, and the shared data were often too old to be useful.

What institutions want research information to do

- Help academics identify funding opportunities to perform research
- Calculate costs to perform research in order to complete grant application in compliance with full economic costing (FEC) requirements
- Monitor academics' funding applications and monitor success rates
- Manage funds once awarded, include invoicing and cash collection at appropriate milestones
- Aggregate and benchmark research outputs and outcomes, including publications, patents, and licences
- Showcase strengths of individual and institutional research activity, for example: through online academic profiles and esteem measures
- Help researchers collaborate by facilitating and tracking opportunities, especially in interdisciplinary areas, within institutions, across departments, and with researchers from other institutions
- Help institutions collaborate by facilitating and tracking opportunities with corporations, national and local government bodies, and with other institutions
- Facilitate business development activities by capturing and analysing a meaningful record of previous activities undertaken with specific funding bodies or potential partners
- Identify talent externally for potential academic recruitment
- Facilitate scenario planning at individual and aggregate levels, e.g. income sensitivity to key staff movements or major projects

Findings: vision for research information

Senior academics consistently articulated the need for holistic, timely, and reliable information. Ideally, they wanted this to be delivered through a data warehouse which would facilitate performance measurement through a series of indicators. Several concurred with an interviewee who described the ideal tool as one that 'sucked data onto a screen at the touch of a button'. Another summed up a consensus view with the following statement:

'Our holy grail is a dashboard for every academic that benchmarks them against peer groups and our own internal targets. It should help managers to decide which themes to target and where to invest.'

With one exception, all institutions developed institutional strategic objectives based on information extracted from internal sources and benchmarking centred on the RAE or other statutory reports. There was a general desire to develop more evidence-based strategy plans, but this was inhibited because the information available was often several years out of date or piecemeal, and therefore only partially met institutions' needs. The most cited requirements in institutions' visions to deliver their research information needs are shown in Figure 2.

A holistic view of research Most institutions complained that their data was held in silos. Integrating separate extracts was labour intensive and made harder by data inconsistencies. The process usually resulted in one-off, time-limited reports that were used once and then shelved.

Specificity There were different views about the level of data required for performance management. These correlated mainly with the strength of feeling towards *individual* performance management. However, institutions generally agreed on the need to access data at an individual level (at least within the research office) to ensure that data quality could be monitored, and that data could be precisely located within the institutional hierarchy.

External benchmarking The need to incorporate external benchmarking information was regarded as crucial by almost all interviewees.

[1] Evidence, *UK Higher Education Research Yearbook* 2009 (Thomson Reuters, 2009)

Most discussed the need for national benchmarking data, and two interviewees indicated a need for international comparative data.

Academic engagement Most interviewees wanted to improve the accessibility of information within their institutions and to engage with academics to encourage ownership of data and support for performance measures. Poor user interfaces were cited consistently as a key detractor of currently available systems. The failure to engage academics resulted in incomplete data, as well as an increased workload for the research office staff required to cleanse data.

Flexibility to meet stakeholder needs A key challenge within institutions is to identify the staff who need (or wish) to engage with the information available and appropriate to them. There is a desire to present information in different ways to suit the individual user. For example, a vice-chancellor's needs are different to those of a head of department. This reflects the difficulty that people have in specifying what is wanted from information tools. Too often, institutional progress had been hindered by attempts to resolve conflicting user requirements and deliver systems that are all things to all people.

Conclusions

Institutions have a significant demand for information to manage their research portfolios. However, the extent to which these information needs could be understood, let alone met and used, varied greatly. Data was rarely used for performance management, and institutional responsibilities for providing, receiving, and acting upon data were often unclear.

There was agreement about using research information to manage institutional performance, but the potential use of performance indicators for individual academics gave rise to a wide range of views, with some feeling strongly that this was a step too far. Inevitably, cultures vary from institution to institution and research information tools must have the flexibility to present data at varying degrees of specificity. For some institutions, aggregated units will take precedence over individual data. For others, detail about individuals will be of paramount importance. Either way, data has to be built from the bottom up within a clearly

defined framework so that flexibility exists with consistency. Without consistency, data and dashboards become unstructured and disconnected which, in turn, can lead to the information they present being misinterpreted.

Institutions claim to want tools to manipulate and present information to a range of stakeholders, but their current capabilities fall well short of their vision. Few could identify the purpose and use to which the information would be put, and few had a detailed picture of what information was most important. The result of an unfocused approach – one which attempts to deliver the information needs of all stakeholders – is to dilute the value of the information. Institutions paid scant attention to the crucial need to tackle data quality early on. Many were critical of academic staff for disengaging and refuting information provided, yet few identified this as a direct result of a failure to address data quality issues early in projects or to engage academics in the definition and development of information requirements.

All institutions were concerned that meaningful external data were extremely difficult to source, and that almost all key performance indicators were retrospective rather than predictive. The requirement is clear: institutions need to be able to understand their strengths (as funders do) and to foster efficient competition (thus increasing research quality).

The need to use information as a predictive tool was rarely mentioned, and only a few institutions provided examples of where it occurred (mainly in finance). Institutions did not appear to acknowledge that an understanding of past performance (analysis of trends and identification of correlations) can be useful in managing their business. A culture-shift is needed to encourage institutions to develop leading performance indicators and to reduce reliance upon historic reporting, which quickly becomes out of date.

There is a growing awareness of the need to develop research intelligence and performance management systems, which is accentuated by a need to develop evidence-based strategies in competitive times. While the availability and quality of data is highly variable, there is a growing consensus about the need to start building a better information base to

support decision-making. In time, and through partnership between institutions, funders and suppliers, there is a possibility of developing better research information tools and improving the competitiveness of the UK research base. This will require long-term effort with clear stakeholder engagement, a focused starting point, and a clearly thought-out strategy aimed at addressing the most pressing institutional information needs. Lessons must be learned from past attempts to design information systems that aim to meet the needs of a variety of research stakeholders.

By trying to deliver competing requirements, systems implementations have ultimately failed to deliver against objectives, and there has been a lack of engagement with user communities. This study identifies potential solutions to these issues for future implementations, such as to define and address the needs of discrete user groups early, to engage academics as well as administrators, and to work collaboratively both within and outside the university sector. RG

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The study can be viewed at
www.researchdatatools.com/downloads/2010-research-information-management-2.pdf