

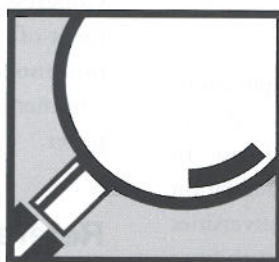
# perspective

## Best practice in using business intelligence to determine research strategy

*John Green, Scott Rutherford and Thomas Turner*

### Context

The UK government objective of achieving sustainable university finances has made the management of research a priority for universities across the UK. Research is core to a university's business. For an institution to achieve continued financial success it needs, at all levels, to ensure it is successful



in winning contracts ('monitoring the university's order book') and in maintaining research spend. Data on research trends, as well as information on an institution's competitive position in relation to its peers, are vital in order to understand an institution's success in delivering its strategy. Providing key, consistent research information to the right staff, at

the right level and at the right time therefore has a fundamental part to play in the decision-making that will ensure successful strategies.

Following the successful introduction of two research management systems at Imperial College London – InfoEd and Oracle Grants – management information is widely available throughout the College. Together, these systems provide metrics that can be reproduced at every level in the College, for the executive management board down to an individual academic. A key challenge is to ensure that this information is engaged with constructively by its audience. Establishing how to pitch data at the appropriate level so that it is neither excessive nor lacking has been a central objective, as users will only engage with information that they deem appropriate. To achieve this, it has been necessary to develop our understanding in two areas:

- Structures – which communities, at what levels within the organisation, require information and the dynamic both within and between these groups.
- Strategies – what these communities are trying to achieve and how management information can support and develop their goals.

*...Establishing how to pitch data at the appropriate level so that it is neither excessive nor lacking has been a central objective...*

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The College has three easily identifiable research management tiers: Management Board (chaired by Rector/Vice-Chancellor), Faculty Management Committees (chaired by Principals/Deans), and Departments. Each receives regular research management reports, underpinned by the same centrally held data on InfoEd and Oracle Grants; as these reports are aimed lower down the organisational hierarchy the level of detail increases. Consistency of interpretation and understanding is only possible if the same information, albeit at different levels of detail, is seen and discussed by all those involved. This also allows behavioural trends to be monitored at the top whilst at the same time being investigated down to the level of an individual academic.

Each of the tiers within the College's hierarchy has a different set of objectives in the context of the overall research strategy, and these objectives also determine what data are included in the research management report that each receives.

## Management Board

Imperial College's Management Board sets and reviews the College's high-level research strategy. It establishes budgets for College activities and ensures resources are deployed effectively. It has responsibility for the delivery of the strategic plan, for developing and nurturing relationships that will enhance the reputation, image and funding of the College, and for responding to any major external opportunities or threats. Its membership is drawn from the most senior ranks of the organisation, including the Rector (Vice-Chancellor), Deputy Rector (Deputy Vice-Chancellor), Faculty Principals (Faculty Deans), and Pro-Rectors (Pro-Vice-Chancellors).

With this remit and membership, the Management Board requires data at the highest level: overall research volumes, competitor analysis, market trends, and institutional work-in-progress. Members

receive a number of reports at monthly and annual intervals.

Using data published by the research councils, it is possible to monitor the College's research council performance against a group of peers on the numerical and monetary percentage success rate of proposals submitted. These data are available for all institutions, making it possible to widen or narrow the group of institutions with which a comparison is made (figures 1, 2, and 3).

The College's research management systems report the number and value of submissions and awards month by month, and track these data across financial years. Using the same information, it is possible to show the cumulative number and value of submissions and awards, so that these can be tracked against College and Faculty strategic plans (figures 4 and 5).

Taken together, these reports assist the Management Board in achieving their strategic objectives of monitoring the research market, maintaining and increasing research income, and assessing the challenges that are faced by the College. More specifically, they assist the Board in its role in ensuring that research attracts and responds to major funding opportunities.

## Faculty Management Committees

The structures in place across the faculties vary in specifics, but each has a committee responsible for faculty management. These committees share the same broad objectives: to develop, maintain and oversee the implementation of faculty strategies, and to ensure that the necessary resources are deployed effectively to deliver the objectives of the faculty. There are subtle differences in the membership, but the core members are the same across faculties and include the Faculty Principal, the Deputy Principal, Heads of Departments, the Faculty Dean, the Faculty Operating Officer and the Faculty Finance Officer.

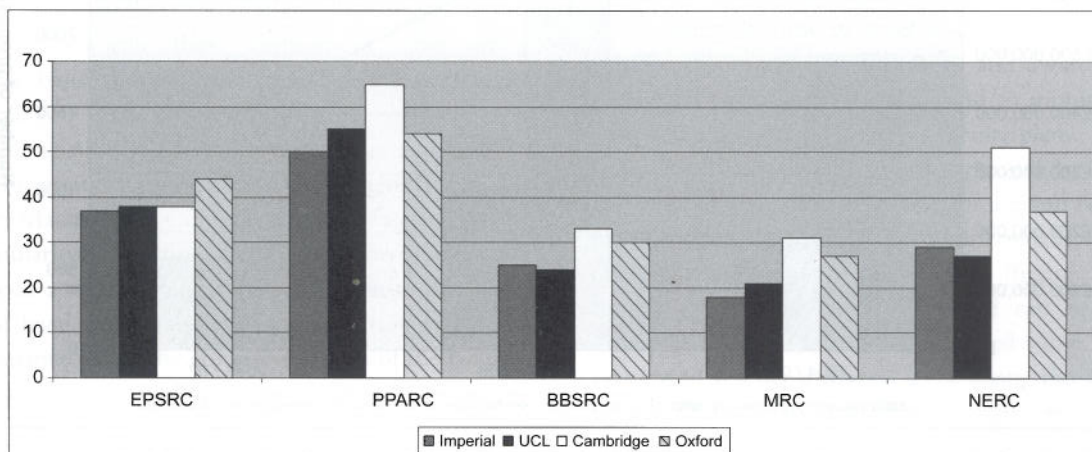


Figure 1. Percentage success rate by number of proposals funded 2004–05

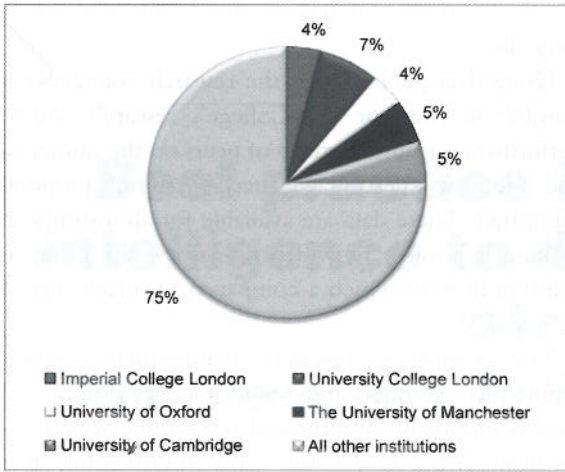


Figure 2. Number of EPSRC awards

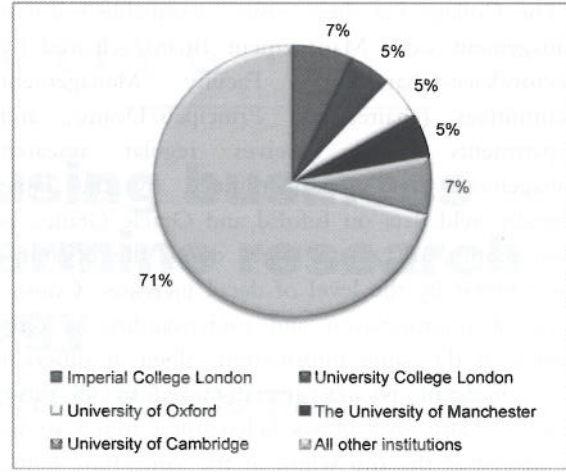


Figure 3. Value of EPSRC awards

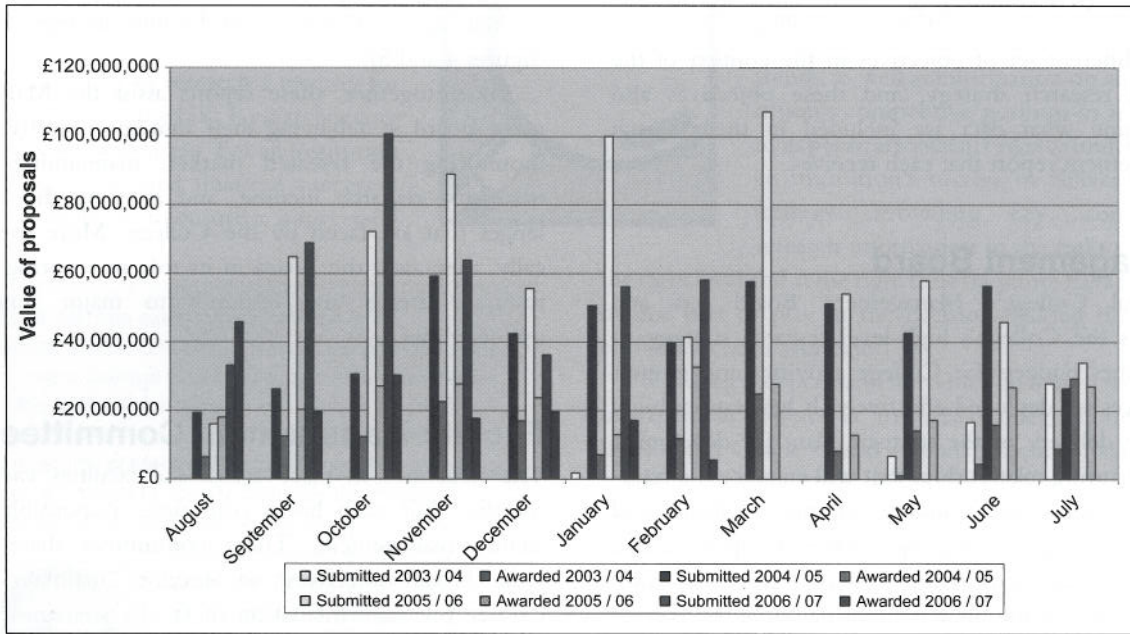


Figure 4. Value of proposals submitted by and awarded to Imperial College in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

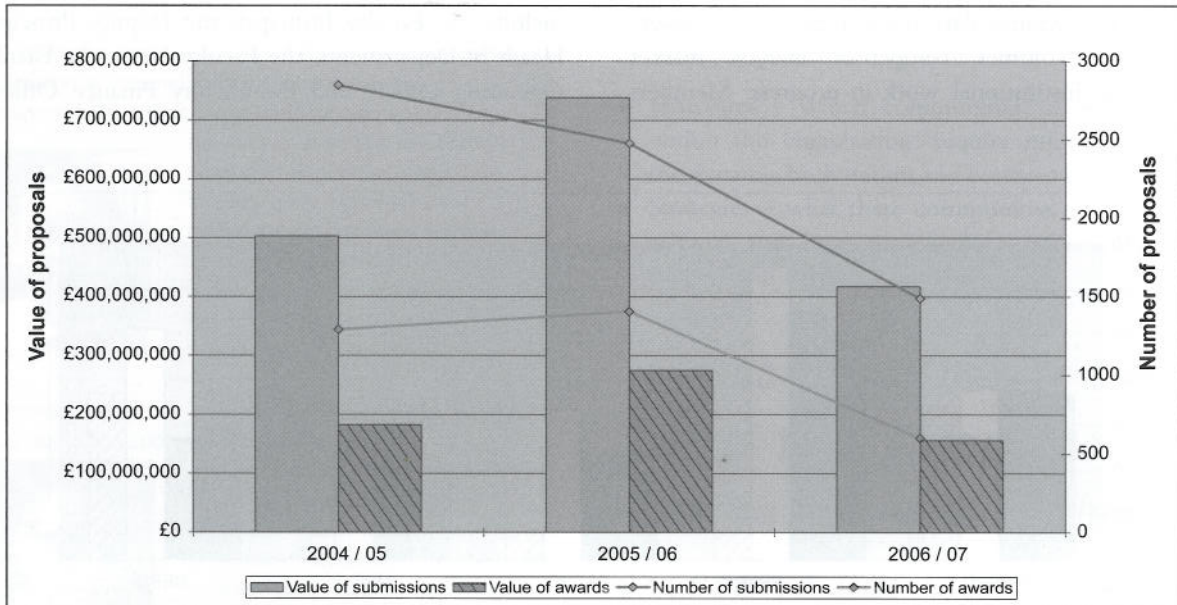


Figure 5. Annual numbers values of proposals submitted by and awarded to Imperial College in the date range 01/08/04 to 28/02/07 (Source: InfoEd)

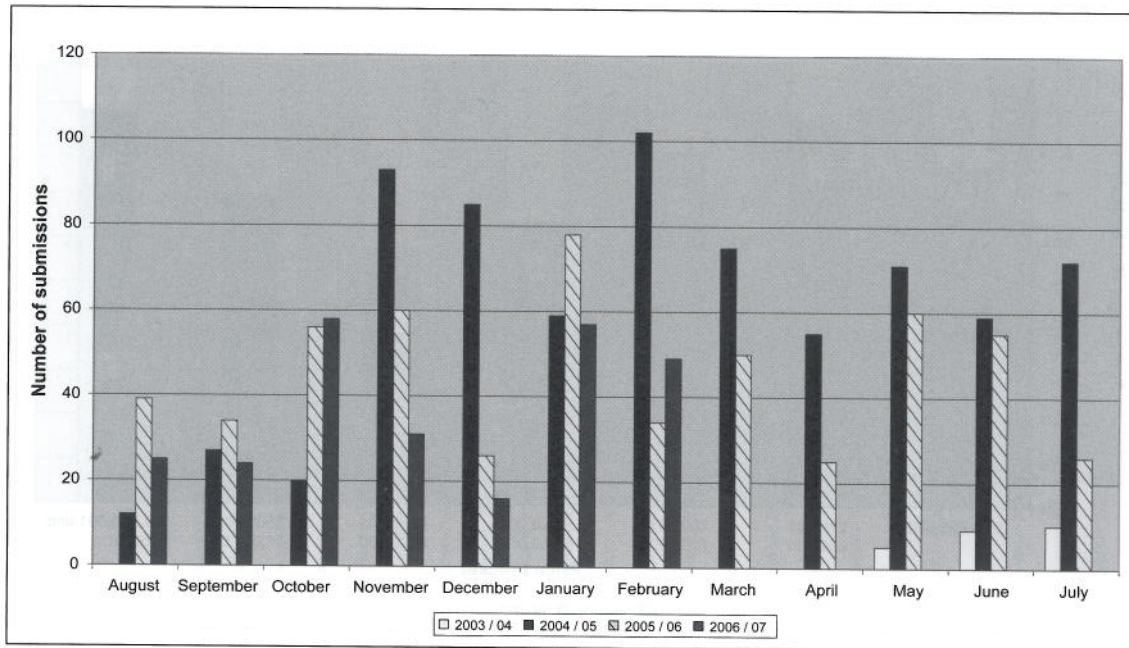


Figure 6. Number of proposals submitted by Faculty X in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

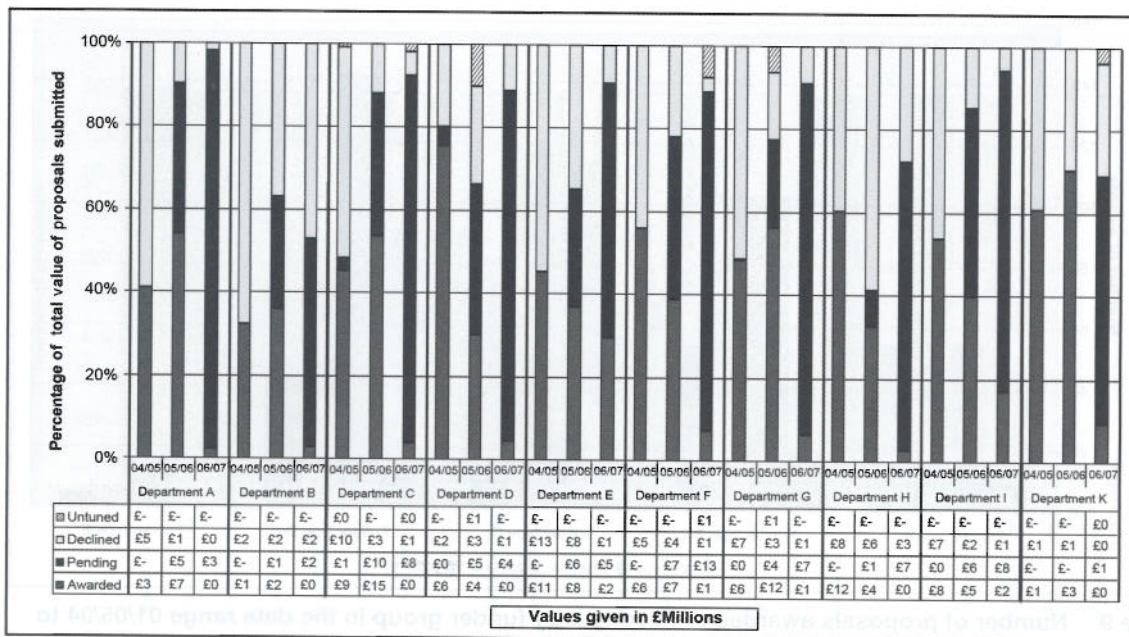


Figure 7. Success rates of proposals (value submitted by division in the date range 01/05/04 to 28/02/07) (Source: InfoEd)

As a general rule these committees meet on a monthly basis, though again, this differs according to the faculty.

Working on broad faculty strategy, yet closer to the academic community than the Management Board, the Faculty Management Committees require a greater level of granularity. Reporting covers the performance of the faculty as a whole, but also breaks down to a departmental level, ensuring that the committee can assess performance across the component parts of the faculty.

Data produced by the College's research management systems can be used to show the value and number of submissions or awards by a given faculty by month and over financial years (figure 6).

The same data can be used to show the cumulative value and number of submissions and awards over a financial year (figures 7 and 8), and to monitor these against the volume predicted in faculty plans.

Further faculty trend analysis is possible by showing the number and value of awards for a given faculty by broad funder categories (eg research councils, industry, charities) and over financial years (figure 9). The success rates of proposals submitted can be broken down by number, value and requested value, and can be viewed at a departmental level. Using this information it is possible to identify the faculty's strengths and weaknesses, to see which cognate areas are performing well, and where assistance might be targeted.

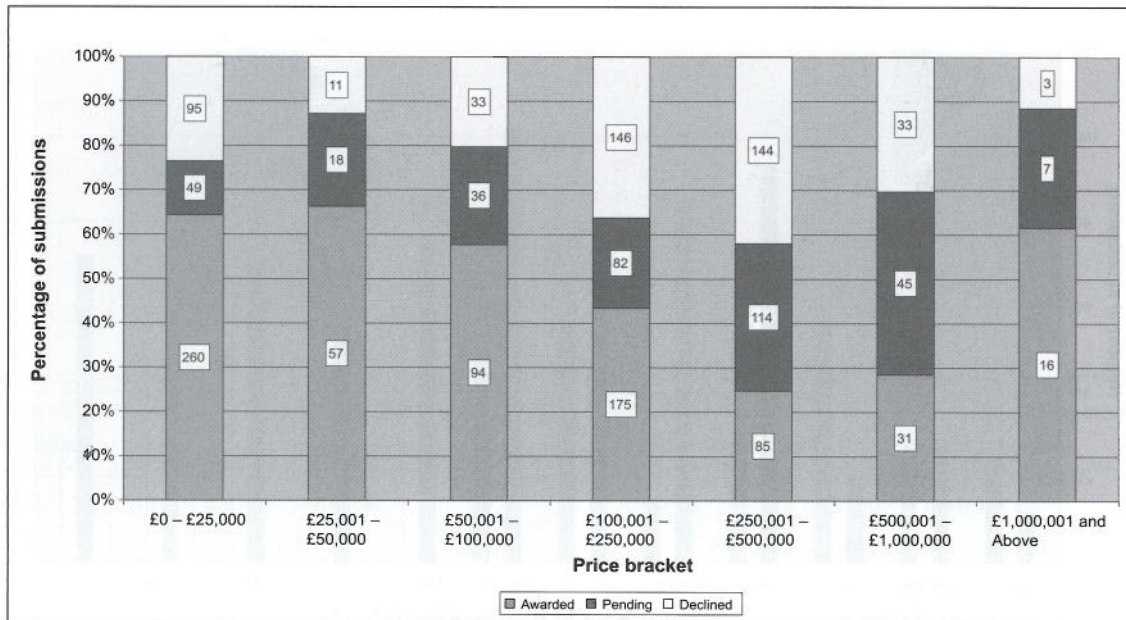


Figure 8. Success rates by requested value in Faculty X in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

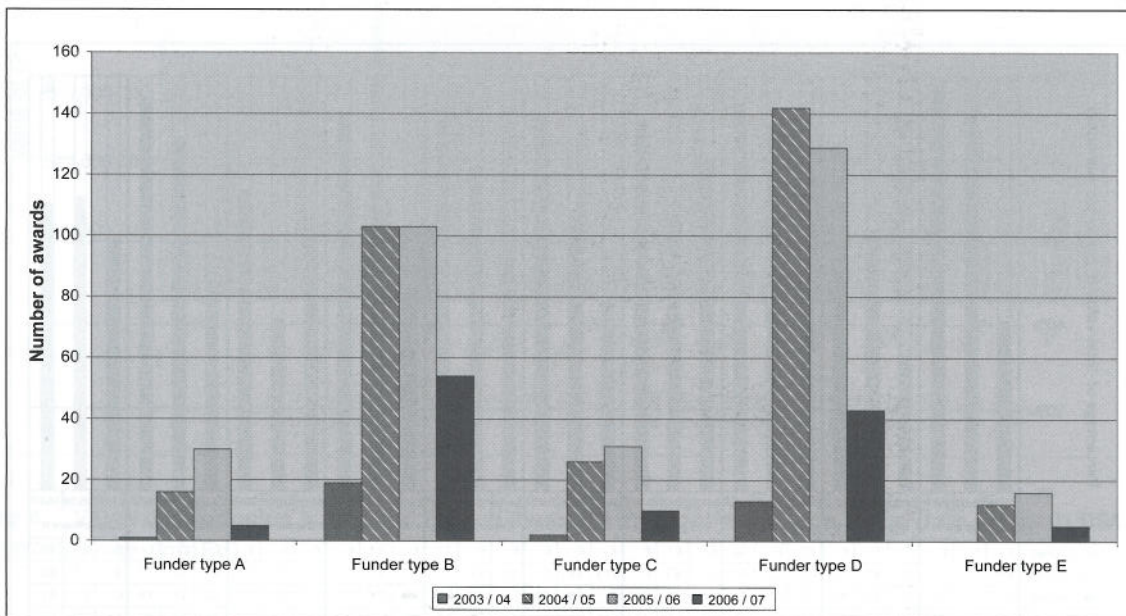


Figure 9. Number of proposals awarded to Faculty X by funder group in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

## Departments

The Head of Department is responsible for delivering research according to the strategies and budget set. To do so he or she needs to analyse the data at an individual academic level, showing the number of proposals submitted, pending, awarded and declined. So, the same data is used at yet another depth of granularity (figures 10, 11, and 12).

Finally, competitor data at an individual level enables Heads of Departments to monitor the performance of Imperial academics against peers elsewhere, providing a powerful recruitment tool (figure 13).

## Information links

Inevitably, at each of the three tiers of management there is some commonality of staff. For example,

Faculty Principals attend Management Board but also lead their respective Faculty Management Committees. This provides links in the information flow, ensuring that information picked up at a College level can be analysed at greater and greater depths of detail in order to diagnose areas of success and failure, thereby enabling management both to reward and to focus on ways to improve.

## Conclusions

We recognise that there is no 'one-size-fits-all' approach to implementing business intelligence strategy within universities. Elements of best practice have been taken from a case study of Imperial College, which may be applied across other institu-

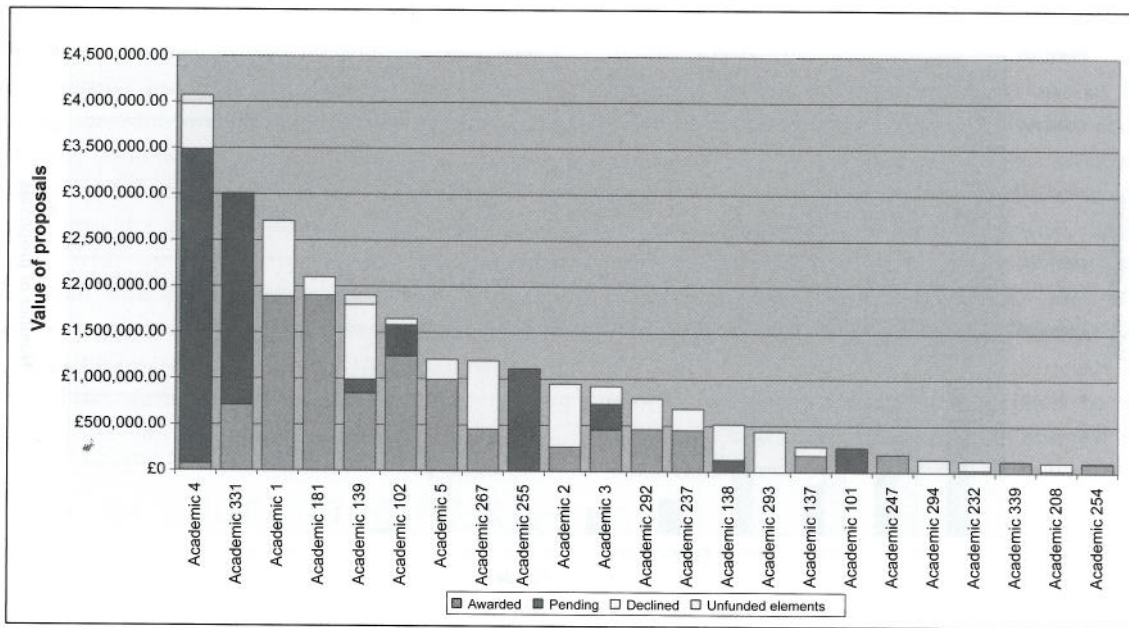


Figure 10. Outcome of proposals (value) submitted by academics in Department A in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

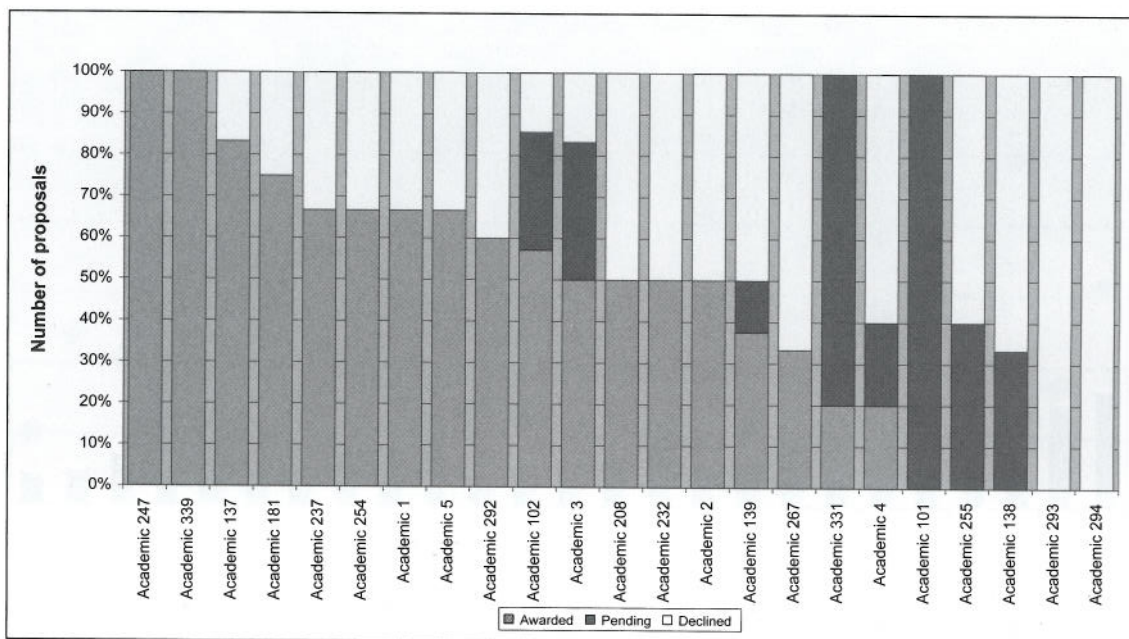


Figure 11. Percentage success rates of proposals (number) submitted by academics in Department A in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

tions. The process starts with implementing and developing systems that capture robust data and provide a platform for enhanced reporting capabilities (Rutherford and Langley 2007). Once this platform has been established, people, process and systems need to be harmonised with each other. Systems need to capture the information in fine detail, which can then be used to underpin reporting at other levels within the organisational hierarchy. By doing this the same information can be circulated throughout the organisation at different levels of granularity, and consistency of understanding can be achieved about how analysis has been

carried out and how decision-making has been informed.

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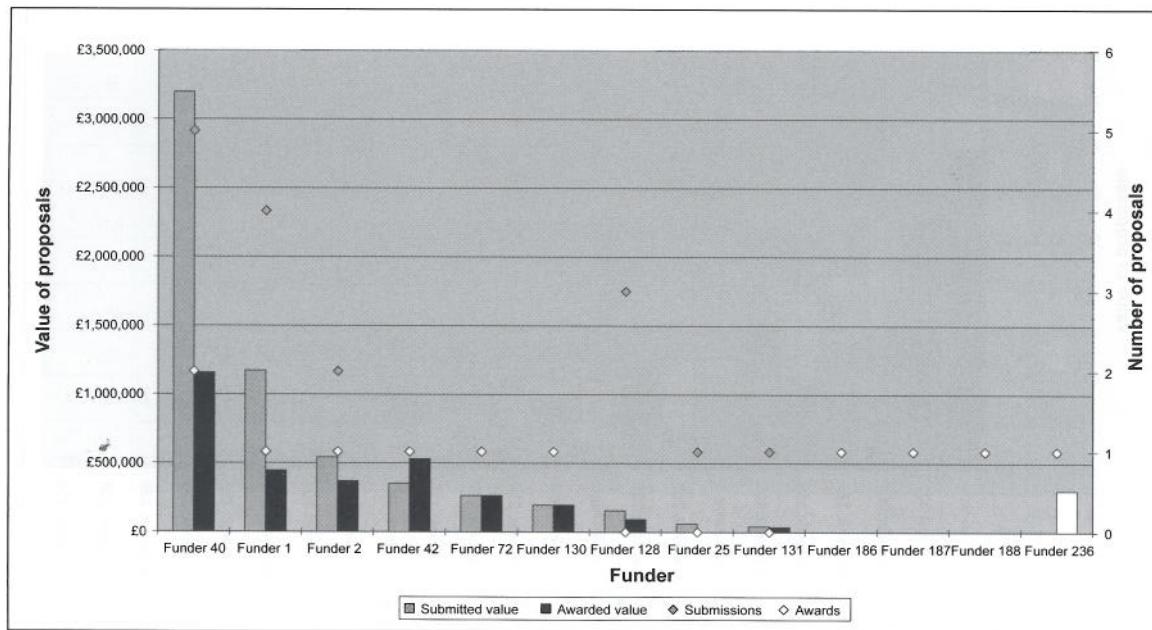


Figure 12. Number and value of submissions and awards by Academic 92 by Funder in the date range 01/05/04 to 28/02/07 (Source: InfoEd)

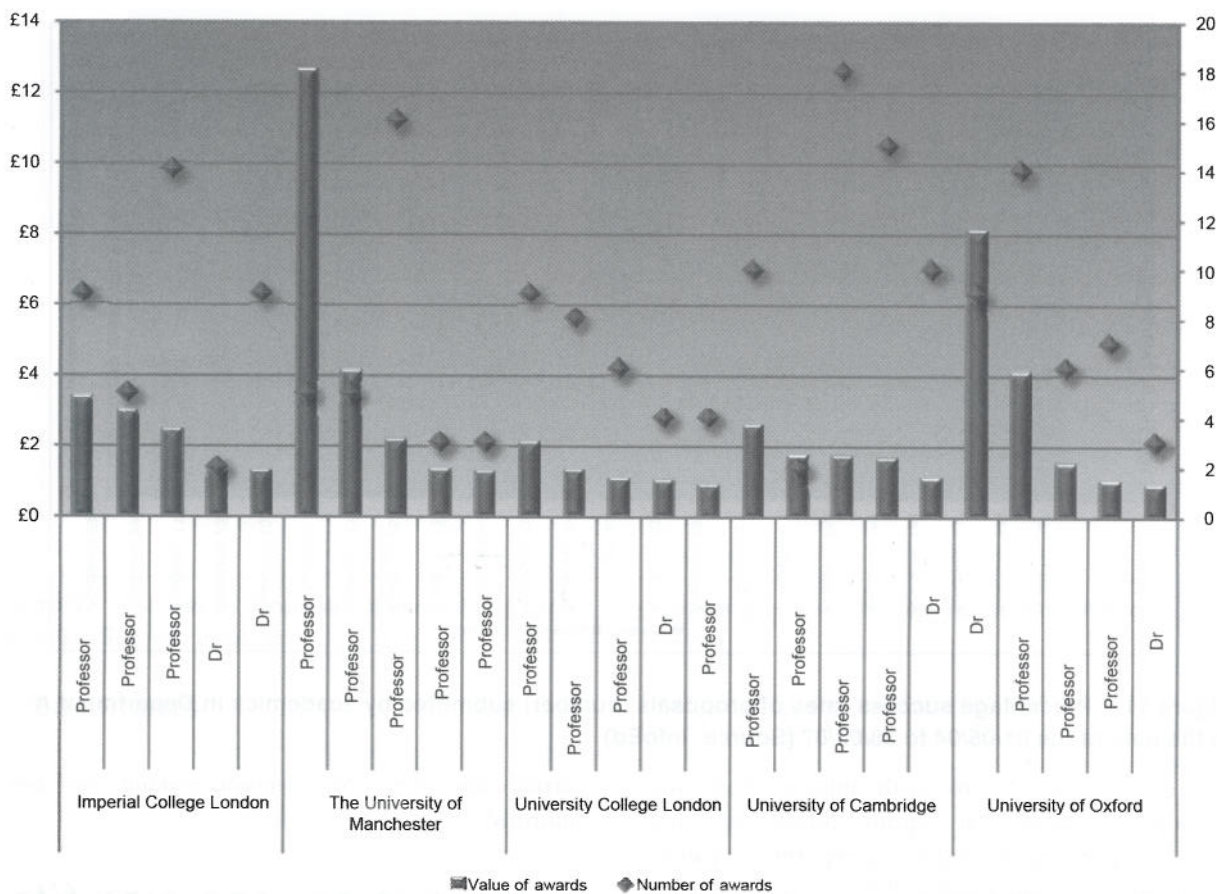


Figure 13. Number and value of NERC awards by most prolific academics according to value (£M)

A clear understanding of the role of organisational stakeholders is critical to a successful business intelligence strategy. No matter how impressive or far-reaching management information becomes within the organisation, it is unlikely to make an impact unless managers understand when and how they

should act upon the information they receive. The organisation must ensure lines of accountability are clearly understood in order to avoid delays and/or confusion in responding to threats or opportunities elucidated through reports. One way to avoid such delays and confusion is to engage report users as early

as possible and to establish the appropriate context for management information: policies and processes that weave reporting into the fabric of the organisation need to be agreed. Meetings with users should be held to agree the content and format of reports to ensure these are accepted and interpreted easily. Such interaction also provides the opportunity to establish, for example, who receives reports for information purposes and who is expected to make decisions. To get the best out of reporting an effective framework must be established with committed stakeholders who understand the organisation's expectations.

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As the organisation's business intelligence strategy develops over time it is crucial to establish mechanisms to revisit and appraise success and/or limitations. Universities do not exist in a vacuum and must continually adapt and respond to the environment they inhabit. Reporting needs are likely to change and the organisation must develop system capabilities and regularly engage with users of management information to ensure relevance and buy-in. However, the guiding principles discussed in this paper of consistent data, stakeholder participation and information policy frameworks are likely to remain significant factors for those leading business intelligence initiatives.

### Reference

Rutherford, S. and Langley, D. (2007) Implementation of systems to support the management of research: commentary from a UK perspective. *Journal of Research Administration*, **XXXVIII**, 85-95.