JISC

Business Intelligence: Monitoring Performance and Planning Improvement

Pathway to best practice   November 2011

This briefing is for **senior managers** needing sound management information for performance monitoring; **heads of planning**; **vice chancellors** (VCs) and **pro-vice chancellors** (PVCs); **heads of academic and service departments**. Anyone with a need to use management information.

> **"It will provide a forecasting capability by allowing us to create a range of 'what...if' scenarios particularly for example, the impact on institutional funding and budgets as a result of changes in the funding of HEIs."**
>
> Bringing corporate data to life project, University of East London

The Context

Business Intelligence (BI) is an essential element of decision-making in the private sector. The education sector needs to catch up. Strategy and planning, and the need to respond quickly to change, need to be based on accurate data about the state of your organisation and the environment in which it operates. Colleges and universities often do not have the accurate, understandable and accessible information that they need to make confident, sound business decisions.

The Rewards

Better business decision-making and change management processes. Business Intelligence provides accurate, up-to-date and easily-accessible data about the institution and its environment, allowing the college or university to be competitive; it can also **adapt more quickly** to changing circumstances, **plan** for the future and **optimise limited resources**.

What We Know Already

What is BI?

BI is evidence-based decision-making and the processes that gather, present, and use that evidence. A Business Intelligence *system* compiles and presents reliable, up-to-date data in a coherent, concise and easily accessible way that is appropriate for the user, in order to support decision-making, planning and strategic thinking.

Technology in the form of specialist BI systems can help you achieve this, but first you to need to have a clear understanding of what good BI looks like and what you want to achieve.

What sort of BI data do colleges and universities need?

Typically, most colleges and universities want data to support decisions about

» Finance and costs
» Students
» Data and information management
» Performance
» Staff
» Benchmarking
» Strategy and planning
» Marketing
» Research
» Business and community engagement
» Estates and space management

Good BI combines information about internal processes, other colleges and universities, and the wider environment - including both government and business.

External data is very useful for benchmarking purposes: HESA, UCAS and HEFCE are just a few of the organisations who hold education data. Our BI Infokit lists many other useful sources of external data.

BI: your level of maturity

Institutions within the sector vary widely in their level of engagement with BI. This is known as the 'level of maturity'. There are six stages in our BI maturity model. They describe the way you currently work with information, and the aims and problems relating to that information that exist within different work areas of your institution.

The level of maturity of BI ranges from disparate, unconnected information sources – eg from Finance, Personnel or Students, with data kept locally in various formats and not widely accessible – up to a fully mature BI system that makes data from many different sources accessible and which is robust enough to aid strategic planning and forecasting.

It is useful and relatively simple to identify your own position within the model – your level of BI maturity. It is harder, but important, to decide what level of maturity you need to aim for – reflecting the needs of your institution, your current position, and how BI contributes to your overall strategy.

This will then help you plan what you need to do to improve your position. Bear in mind that moving from the first level of maturity – unconnected information sources – to the next – coherent accessible information – can be a very substantial step for most universities and colleges. That first step probably requires more change in your culture and systems than any other.

Technology and method

There are a number of approaches to choosing and implementing BI technology.

Some colleges and universities build their own, treating BI as an in-house IT project. This can be successful and provide the exact functionality that is needed, but it is vital to have a very clear brief, to be sure what you want to achieve and to think ahead to what you might need in future, or the project may end up costing more than a bought-in solution and not providing everything you need.

You can buy systems from a wide variety of vendors, and there are variations in what the technology can do and how you source it:

» You do not necessarily need to use a single vendor and implement a 'single central system' which would cover all areas of your institution. You can use different vendors' systems for, say, finance data, student data,

etc, as long as when you extend the system to a new area the new vendor can link it to the existing systems

» You can choose a system which stores all your data for you and then presents it – a data warehousing with a 'dashboard' interface – or a system which links up your existing data sources and makes them widely accessible.

Data

Your BI will only ever be as good as the data you put in, no matter how advanced the BI system you install.

Data is the big cost behind any BI project; it is worth investing in getting your data clean and consistent. This may require a cultural change in the approach to data, including its provenance, how it is compiled and used, and where it is stored.

One approach to BI, and clean and consistent data, is to build a single data warehouse with a system that displays information from it. The University of Liverpool have gone down this route, as outlined opposite.

Costs

There is a range of prices and levels of support to fit most situations. BI systems can be implemented for about the cost of one full time staff member. An effective BI system will almost always save the equivalent of one full time staff member in time needed to collect data, correlate different systems, prepare reports, and answer strategic questions from senior management.

Central Lancashire's dashboard

University of Central Lancashire (UCLAN) is creating a BI system to use student and staff records systems and their new customer relationship management (CRM) system. This will enable them to perform greater predictive analysis, model outcomes and understand the factors that affect different scenarios.

This project is working with stakeholders to redefine the ways that users get timely, relevant evidence. Microsoft SharePoint will deliver the user interface, linked to appropriate data sets through a data warehouse. The interface can be personalised so that users can get the data most appropriate to their needs.

BIRD – Business Intelligence Reporting Dashboard project, ongoing, University of Central Lancashire. **http://bit.ly/td5QuK**

The 6 stages of the Business Intelligence maturity model

1 **Unconnected information** sources, eg from Finance, Personnel or Students, with data kept locally in various formats and not widely accessible. Data consistency and quality may also be highly variable.

2 **Coherent, accessible information**; made possible by high-level strategic support, replacing systems as needed to be more centralised, using this central data a rather than local data, and making staff responsible for the data they input and ensuring its quality.

3 **Ready to set up a BI project**: selecting an approach (eg single central system, data warehouse, or 'build-your-own') and a vendor to supply the system you need.

4 **Initial BI system in place**, with the functionality limited to the scope of the project area.

5 **Extending the coverage** of the initial BI system in stage 4 to include other parts of the institution.

6 **A fully mature system** that allows data to be used for predicting the effects of likely futures, so aiding strategic planning.

Liverpool focuses on key ambitions
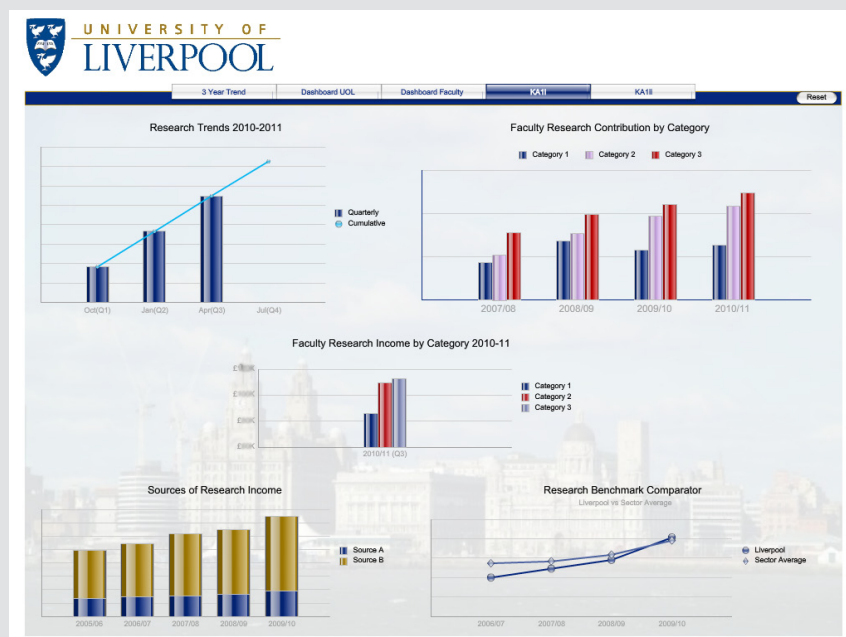
The University of Liverpool is creating a 'data dashboard' to present information to support planning and performance and to monitor achievement of KPIs. These include

>> Research income analysis

>> Market share of student applications

>> Student satisfaction

Liverpool has chosen a data warehouse which will draw data from existing corporate information systems, and a dashboard front end which will display information to users in a variety of formats. The system will provide graphical displays of a wide range of management information.

The dashboard will allow users to drill down from the level of institution, through the various organisational levels to individual student or staff member. Senior staff, including the Vice Chancellor and Chief Operating Officer, are highly supportive of the project as it will provide them with instant access to high level management information for performance monitoring.

Liverpool University Management Information System (LUMIS), ongoing.

The Open University

Because the Open University is a distance learning institution, there is little opportunity to monitor students' engagement with their programme of study via their attendance at lectures. Instead, the Open University is using Business Intelligence techniques to identify students potentially at risk, via their engagement with the University's Virtual Learning Environment (VLE).

As different courses use the VLE in different ways, the OU need to be able to use BI tools to model the expected profile of VLE usage against observed use. This will identify those students who are not using the VLE as expected and who therefore may be at risk of disengaging from the course.

As well as supporting individual students it is expected that this information will be used to inform course management and development.

"For institutions and students, successful completion of studies has never been more important. As students increasingly interact with teachers and their institution online, the data we can harness to understand student progress and identify students at risk of drop-out gets richer and richer. The RETAIN project helps us to turn these data into a meaningful basis for interventions with the right students at the right time. At the OU, the quality of future students' learning experience depends on our skill in making sense of and using the data that the RETAIN project is working with."

Will Swann
Director, Students

"The more anticipatory the support provided to students, the less complex the intervention then needs to be, as issues are dealt with before they become insoluble. This is our experience of the Student Support Review pilot."

Elizabeth Mullett
Assistant director, Student Services and operational manager of the SSR pilot team

Challenges for the education sector

Business Intelligence is becoming more necessary in the education sector, but it is still not widely used and this may be due to a number of things:

» Lack of top-down engagement; senior staff may lack awareness of the issue or be uncertain of the business case for BI

» Lack of understanding of the effort needed and processes involved can result in organisations trying to build a BI system themselves; this can often end up costing more than buying a system from a vendor

» Data: lack of quality and lack of consistency of data definitions. Consistency and comparability is a particular problem with external data and when comparing things like KPIs with other colleges and universities for benchmarking purposes

» Control and 'ownership' of the BI system. Users need to take ownership of their data, however BI is often seen more as an 'IT project' rather than a service used by everyone

» Making a business case. It's important to calculate the likely return on what is a very big investment. This can be hard if you lack coherent business data to start with

» Data security. This is vital but obstructive security reduces the value of the system – people lose access to the data they need. A balance is needed so it is worth checking which information needs to be confidential

Accurate and informative data alone do not ensure success. Analysis helps inform your actions, but you need a strategy to carry them

Glasgow finds research collaborators

Glasgow University is developing a way to categorise and catalogue researchers and research clusters within the University. This will support researchers by providing an intuitive method of identifying potential collaborators for inter-disciplinary research projects. The University's' BI tool will allow users to drill down into the cluster to not only identify individuals but also access further details about past and current research.

http://bit.ly/vsp0r1

out. One of our other guides in this series, 'Strategic management: making IT work for you', is a brief introduction to the subject.

Getting started

» Work out what you want to achieve

» Where are you now? See where your institution fits in our maturity model. Note that the level of maturity may not be the same across your institution; there could be higher and lower levels in different areas. Don't find one good or bad example and assume it is representative.

» Look at the technology and approaches that are available.

» What's the scope of the BI system you think you'll need? How does this relate to your institution's overall strategy?

» Prepare a business case to ensure senior management and department head buy-in.

Further information and resources

The JISC Business Intelligence infoKit takes you through all the things you need to consider.
http://bit.ly/dPIlxC

This section will help you find your organisation's position in our maturity model:
http://bit.ly/rIHJaT

And this section will help you when making your business case for BI:
http://bit.ly/tLk54o

JISC Strategy infokit: for setting BI within your overall strategy:
http://www.jiscinfonet.ac.uk/infokits/strategy

JISC System selection infoKit – a general process for procuring new ICT systems):
http://bit.ly/9zZP1D

The 11 JISC Business Intelligence projects running in UK colleges and universities 2010–12:
http://bit.ly/vRHQEs

See also in this series

'Flexible Services for Agile Institutions'

'Strategic management: making IT work for you'