



IU Business Intelligence Roadmap

Purpose and Objectives

Business Intelligence (BI) is a broad category of skills, technologies, applications and practices that enhance the use of information for better decision-making. In an era of increasing competition and demands on the University, the need for relevant information has never been greater. This document provides a high-level overview of why BI is needed, what the benefits will be and a proposal for how the University should pursue such a transformation.

The emerging generation of BI tools and technologies support previously unattainable levels of measurement, comparison and institutional interventions to improve core businesses processes and outcomes. The implementation of BI is an opportunity for Indiana University to empower decision-makers at all levels, move to a more proactive utilization of information, and fundamentally change the way organization operates.

The IU BI roadmap is a strategy that revolves around assessing the information needs of a core user group regarding key business objectives and using that information and the continuing guidance of those users and other relevant functional area and information experts to select and deploy a set of BI solutions. The BI initiative will employ this general strategy to define priorities, enhance communication between the full range of staff involved in transforming data into useful decision-support information, and to help the campus and university communities define and align their key objectives across units (horizontally) and up through the executive leadership level (vertically).

Objectives of this document:

1. Describe a strategy and specific actions for addressing targeted problems and issues related to an IU Business Intelligence initiative.
2. Establish institutional awareness, sponsorship and support.
3. Identify actions and resource requirements for the initial phases.
4. Establish an overall framework to guide priorities and practices for ongoing, related initiatives.



IU Business Intelligence Roadmap

Background

The 2009 Indiana University Strategic Plan for Information Technology, *Empowering People*, includes two specific action statements for improving access to and use of administrative data for decision-making activities throughout the University:

- *Action 30: IU should provision and support modern tools for report writing, ad-hoc queries, and decision support. Suitable tools should address the needs of professional, functional, and IT staff as well as non-IT professionals who have needs for administrative data.*
- *Action 31: IU should begin a process with its administrative users to update its core data model to match the current and likely needs of a 21st-century IU, including essential relationships beyond IU (e.g., the IU Foundation, Clarian Health, other colleges and universities, etc.). Changes should be implemented in a fashion that is evolutionary, yet deliberate, and least disruptive to ongoing IU operations.*

Toward these ends, a Business Intelligence Task Force (BITF) was assembled including approximately 25 individuals representing a wide cross-section of the enterprise system areas along some campus level representation.

Early in the process it became clear the University could benefit from an independent external assessment of our current environment for decision support information and, more generally, our Business Intelligence capacities. IBM was commissioned to conduct the external assessment.

The assessment involved interviews with over 170 IU academic and administrative staff members representing many key areas. The results of the assessment were documented and presented to the BITF for review and comment.

The following is an excerpt from the BI Assessment:

“Indiana University is a data-rich organization, as it collects elements on all aspects of students, faculty and staff, facilities, finances, budgets and research. However, this assessment has uncovered that although all of this information is collected, it is not in the most usable format as possible for the key decision makers at all levels within the university.

Currently the university is heavily dependent on the IUIE and its underlying data structures to provide key data elements needed for operational reporting. However, the university is lacking in its ability to perform analysis across the functional areas both in a structured format as well as in an ad hoc nature. Mired in decade old reporting practices, the university does not approach decision making at



IU Business Intelligence Roadmap

a university wide level, by defining key performance indicators to keep a pulse on the state of affairs. Instead, the decision making is pushed down to the lowest levels of each functional area, allowing decisions to be made that might best suit the functional area rather than the university as a whole. “

Indiana University's 2009 strategic plan for information technology, *Empowering People*, acknowledged the need and a desire for significant changes to our decision-support information resources and capacities. IBM's assessment validated the problems and described a generic approach for moving forward. However, their approach did not sufficiently accommodate the organizational structure and practices of the university and its constituent campuses. In the remainder of this overview, we target specific problems and suggest a strategy that will be effective across IU's diverse campuses, academic programs, and administrative structures and processes.

Targeted Problems and Issues

Transforming IU's decision-support environment will ultimately require investments in new technologies. However, the assessment report described problems in the current environment that need to be addressed before purchasing and deploying new tools and technologies. These include:

- Key decision makers, especially academic deans and their staff, lack access to information that is sufficiently integrated and timely to address their highest priority decision-making needs, as well as tools for the interaction with that information effectively;
- Insufficient level of collaboration among functional areas and the corresponding lack of standardized terminology for business information and fragmented management of data and reporting systems;
- Lack of alignment among business unit strategies, performance measures and university goals and objectives;
- The proliferation of “shadow systems” based on inconsistent conventions for capturing information and generating reports creating redundant, unaligned and unsustainable systems that address local information needs at varying levels of sufficiency and create multiple “versions of reality” that detract from effective use;

Members of the IU BI Task force recognize within the problem statements above many of the day-to-day issues they face in trying to meet the diverse decision-support information needs of the university community. Moreover, we recognize that these underlying issues relate



IU Business Intelligence Roadmap

more to the manner in which communities within the University work together than to the technologies used. Ultimately, a more effective basis for identifying and implementing appropriate technologies must first re-shape how work is conducted across units to meet needs of the diverse array of campus and university decision-makers. We also recognize that the core educational and research units that comprise the campuses of Indiana University are decentralized and loosely coupled. However, we believe the administrative processes systems that support these units must work in a more organized and coordinated way to meet the diverse needs in a way that advances the core objectives of the campuses and the university as a whole.



IU Business Intelligence Roadmap

A Strategy for Moving Forward

The remainder of this document outlines an approach for addressing the above problems via an IU Business Intelligence initiative.

Guiding Principles

The following critical values and directions will guide decisions made during the planning and execution of the IU BI Initiative.

Information

- Support a culture of fact-based management to drive decisions, actions, and outcomes.
- Maintain an environment of open information access, unless there is a compelling reason or policy to the contrary.
- Provide an environment which is user-friendly, easy to understand, and easy to access.
- Maintain an environment that is inclusive of all university data and not limited to enterprise systems.

Process and Outcomes

- Facilitate linkages among goals and performance measures at the university, campus, school, department, and support unit levels.
- Pursue university-wide solutions which can be leveraged by all units within the university.
- Encourage shared solutions for common needs and local solutions for specialized needs.
- Invest in the optimal solutions for the university rather than commit to a single approach, technology, or vendor.
- Strive to maintain a consistent level of service and availability of information during the migration to a new BI environment.
- Implement change management processes to support the communication and education needs which will result from the migration to a new BI environment.
- Encourage continuous process improvement.

Governance

- Make decisions based upon advancing IU's core objectives of education, research, and service.
- Pursue governance with cooperation and collaboration.
- Maintain an environment of transparency and open information sharing.



IU Business Intelligence Roadmap

- Seek engagement from a broad spectrum of the campus communities.
- Balance university-wide requirements with unique campus and school requirements.
- Be responsible stewards of university resources.

Critical Success Factors & Risks

The following are factors essential to the success of the IU BI Initiative.

- Executive sponsorship
- Availability of sufficient resources, including:
 - Funding
 - Qualified staff
- A high level of data quality.
- Alignment with IU's core objectives of education, research, and service.
- Satisfy the information needs of the broad IU user community.
- Availability of subject matter experts from all functional groups.
- Provision of the required BI-related education of functional and technical professionals.
- A strong communication plan which is phased and targeted to specific groups of users.
- Acceptance of a set of standardized BI tools, policies, and procedures to support the BI Initiative.
- A sustainable BI environment with the ability to adapt to future requirements.
- A strong evaluation plan with measurement of outcomes at major milestones.
- Acceptance of a phased and iterative development approach.

Failure to achieve each of these factors will create risk for the Initiative. Additional risks related to the Initiative are identified below.

- Lack of consistent business rules definition and documentation.
- Issues concerning ownership of data.
- Resistance to organizational change.
- Lack of commitment and support throughout IU.
- Insufficient time and resources given the range of development initiatives currently being pursued across the campuses



IU Business Intelligence Roadmap

Core Objectives

The proposed strategy for moving forward revolves around the following core objectives:

- 1. Improving Collaboration.** Administrative function managers, information specialists and IT staff need to communicate more effectively about information needs among and between decision-makers in academic and administrative units.
- 2. Developing Shared Meaning.** The information provider community must develop more comprehensive definitional standards that will accommodate the diverse needs of IU programs and campuses while reconciling at increasing levels of aggregation (from programs to schools to campuses to the university). That is, rather than agreeing to use the same term to mean different things (e.g., enrolled student, faculty, expense budget), we must develop more nuanced but commonly accepted standards that accommodate differences within accepted limits.
- 3. Decision Making.** Encourage a fact-based, data-driven approach to decision making based on the alignment of information to management and university goals and objectives.
- 4. Common, Accessible Data Resources.** The IT and functional area data stewards must develop shared data systems that contain well-documented and useful decision-support information that are accessible to a range of users with varying levels of technical expertise.
- 5. Appropriate Technologies.** Academic and administrative decision-makers, functional area experts, and information technologists must work together to identify, implement and support a sufficient range of modern business intelligence tools that enable users with varying levels of browsing, reporting and analysis expertise to access and manipulate the data resources described above.
- 6. Education and Communication.** The concept of business intelligence is complex and requires a familiarity and understanding across both IT and operational methods and practice. Facilitating such awareness through effective communication and education plans across the University will be imperative.



IU Business Intelligence Roadmap

Before committing significant but scarce monetary resources to purchasing new tools and technologies, we recommend devoting an appreciable amount of another scarce resource, our time, to addressing the communication and definitional problems described above. We believe that by first focusing on identifying priority needs and developing effective definitional standards to address those needs, we will be well-positioned to then develop common, accessible data resources and to deploy state-of-the-art tools for manipulating data from those resources.

The strategy for moving forward includes the following components:

1. **Focus on the information needs of academic associate deans and their administrative area equivalents.** We believe that the faculty and staff in these roles represent the “front line” staff for information needed and used by academic deans and other senior administrators regarding the most mission-critical objectives of the university (education and research/scholarship). Moreover, we believe that the information needs of these individuals have been least well-served within the current environment;
2. **Engage administrative and functional area experts** representing the key operational information domains in a dialogue with the target group to identify processes and structures for translating available data into effective decision-support information.
3. **Identify a set of core business objectives** around which to build initial solutions for enhancing information support. As a starting point, we suggest using a slightly modified version of the core objectives identified in the IBM report:
 - Students
 - Recruit and retain higher quality undergraduate students
 - Recruit and retain a more diverse student population (including more international students)
 - Faculty
 - Recruit and retain highest quality faculty
 - Provide support for faculty to improve student learning and research productivity
 - Finance
 - Increase sponsored contract and grant funding
 - Increase funding, scholarships, and fellowships from alumni and foundation supporters
 - Infrastructure and facilities



IU Business Intelligence Roadmap

- Replace existing and expand new facilities for research, teaching and learning, and effective service processes
 - Optimize use of facilities
 - Minimize risk to the university
4. **Link the BI initiative to other relevant ongoing information support development efforts.** Recognizing that there are several high priority needs for improving information environments, we include a mechanism for identifying such initiatives and linking them to the broader BI initiative so that each can inform the other (that is, individuals associated with the BI initiative will provide input to ensure that common identified information needs are accommodated in the ongoing initiative, and those involved in the ongoing initiative can inform the BI initiative regarding the kinds of information needs that were identified through that project).

Proposed Organizational Components of the Program (Governance)

We propose a governance structure for the IU BI initiative that includes five central groups as well as a steering group and *ad hoc* task groups that are assembled as needed for implementation purposes. The five central groups include:

Executive Leadership Group – *Review and Approval of Plans and Arbiter of Policy Issues* – Reviews, provides input and ultimately authorizes the activities of the BI Initiative and recommends priorities for obtaining and allocating funds and resources. This group should include University Vice Presidents with the most directly related portfolios (Wheeler, Applegate, & Theobald), as well as two or three senior campus academic officers.

Core User-Provider Advisory Group – *Identify and Prioritize Information Needs* – Provides guidance for identifying and prioritizing information needs among the target users, assists the BI Task Force in devising the user-needs assessment, interpreting results, and developing strategies for meeting the identified needs. The group should be comprised of representatives of the principal user population of interest (associate deans) as well as representatives of administrative offices that have functional expertise pertaining to the major information domains.

Faculty Expert Group – *Review and Critique the Initiative* – Reviews the initial road map and subsequent plans at each stage of the effort, provides expert critique and guidance relative to the literature and industry practice. The group would consist of faculty with



IU Business Intelligence Roadmap

expertise and interest in business intelligence, higher education organizational development, or related disciplines.

BI Task Force – *Operational Planning and Implementation* – Develops and implements plans for the initiative as informed by input, guidance and authorization from the three other groups. Comprised of administrative functional area managers and information specialists, as well as IT staff. Although this group was initially formed during the early planning stage the membership will need to be re-evaluated to assure appropriate representation of all campuses.

Project group - *Project management* - Maintains timelines, schedules, task lists and provides project status information to the other groups. Coordination responsibilities include scheduling events, maintaining documentation, enabling communication between groups, initiating meetings as needed to resolve issues and serving as a central handler of questions and issues other groups may encounter.

The BI Initiative Steering Group:

We propose to constitute a steering group with a few members from each of the BI Task Force and the Core User/Provider Group. The Steering Group would have overall project management responsibility for the BI Initiative, set the agendas for meetings of both the BI Task Force and Core User/Provider groups, and serve as liaison to the Executive Leadership Group.

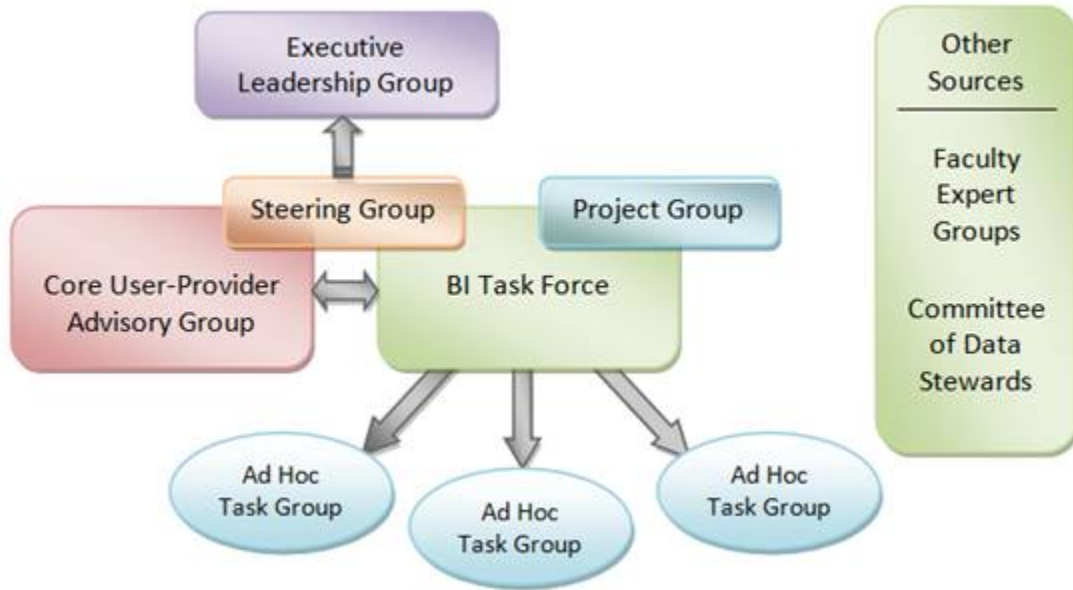
Ad Hoc Task Groups:

As the BI Initiative proceeds, task groups would be identified to manage specific aspects of the project. These groups would likely include members of the BI Task Force as well as a wide array of professional and technical staff from across the university.



IU Business Intelligence Roadmap

The following figure graphically depicts the IU BI Initiative governance structure:





IU Business Intelligence Roadmap

Planning

The approach to this initiative must minimize disruption to ongoing processes and preserve the key strengths of the University culture—decentralized and loosely coupled authority structures that enable creativity and innovation throughout academic and administrative programs. As stated above, one of the core objectives is to significantly alter the way in which administrative support offices and staff collaborate as a community to meet the diverse information support needs of administrative and academic decision-makers throughout the campuses of Indiana University.

We recognize that this is an extremely ambitious task that will require persistent attention for a significant amount of time. We do not believe there can or should be a revolutionary, short-term approach. Rather, we recommend a more evolutionary path for continuous improvement. That is, we need to alter the way we work together to meet information needs so the continuing changes we make will be directed toward a more effective decision-support

Initiative Phases

Our roadmap includes four general phases and a set of ongoing activities related to education, assessment, communication, and linkages to relevant ongoing information system enhancements.

1. **Planning & Strategy (Fall 2009).** This phase began with the IBM Assessment and ends with the approval of this document by the Executive Leadership group. The Roadmap serves as a strategy for moving forward as well as a vehicle for soliciting sponsorship & support. The final steps in this phase include: a) vetting the IU BI Roadmap with a select range of individuals that represent the various groups described in the governance section and making suggested changes; b) sharing the report with a formally constituted executive leadership group; and c) making changes to the roadmap as suggested by the leadership group to obtain their approval and sponsorship.
2. **Needs Assessment (Late Fall 2009 – Mid- Spring 2010).** The second phase provides a context - a set of principles, standards and procedures - within which we can approach future implementations including ongoing projects. Toward this end, the core-user/provider group and the IU BI Task Force will work toward developing and implementing a needs assessment among the target user group (academic associate deans and administrative area equivalents).



IU Business Intelligence Roadmap

3. **Action Plans and Priorities (Late Spring 2010-Summer 2010).** In phase three of the roadmap, we analyze and interpret the results of the needs assessment and, on the basis of those results, identify and prioritize a set of action plans for addressing those needs. These plans are then brought to the Executive Leadership Group for review, requested adjustments, and approval. We anticipate that the actions will include changes related to the organizational configuration, responsibilities and roles of information provider supports offices and staff; the development of well-documented and standardized information resources; and the selection of new user tools for accessing and analyzing the data.
4. **Design, Development & Implementation (Fall 2010 and Beyond).** Once action projects are chosen and prioritized, we can move into phased implementation as guided by priorities and available resources.

Ongoing Activities

For the duration of the project, we identify a set of ongoing activities for ensuring success and essential linkages between the projects and related information systems development initiatives

Education of Initiative Participants

Even for those with expertise in its terminology and implementation, the concept of business intelligence (BI) is complex and requires a familiarity and understanding across both IT and operational methods and practices. It is essential that such complexity be not only understood, but that the members of the task force also be able to effectively communicate said complexities to a variety of audiences both internal and external to the university.

To meet these goals, a variety of educational initiatives will be implemented:

- Review of BI “best practices” from other organizations
- Academic and professional research
- Faculty presentations
- Vendor research/presentations
- Education for others involved with the BI initiative

Communications

As the Business Intelligence initiative proceeds, it will be essential that we communicate in a timely fashion the projects objectives and status to a targeted audience, including the participants in the BI Initiative governance structure as well as the broad community of core



IU Business Intelligence Roadmap

users. In order to meet these diverse communication requirements, the following communication strategies and methods will be employed:

- Development of BI initiative Web site
- Presentations at administrative/staff meetings
- Distribution of information across various online channels
- Timely distribution of executive leadership e-mail updates

Linkages with Ongoing Information System Enhancements

Priority information systems development efforts must continue as we conduct the needs assessment. Therefore we seek to monitor and create needed linkages between these efforts and the developing IU BI Initiative. Toward this end, the BI Task Force will identify relevant information systems developments that are already underway or are being planned for near-term development. The individuals involved in those developments will be made aware of the goals and objectives of the overall initiative and asked to consider how their project may accommodate these objectives. Conversely, participants in the BI initiative will be made aware of these initiatives and will seek input from project participants that informs the broader initiative's development.

The diagram at the end of this document provides a graphic depiction of the roadmap.

Resource requirements

As stated above as a critical success factor, the availability of appropriate resources will be imperative. To this point, resources have come from members of the BI Task Force. However, relevant resource planning will be critical as we transition through the phases and the availability of resources will be dependent upon endorsement from the governing groups. The recognition of competing priorities along with overall endorsement of this initiative will require decisions related to resource allocation.

The following is a general description of resources required for the initiative in the early phases and beyond:

Initial resource requirements

Governance – members of the various governance groups will be asked to participant in a series of meetings, related sub-group work and project support.



IU Business Intelligence Roadmap

Requirements Gathering –requires a series of interviews and therefore will involve two categories of resources outlined below;

Interviewees - decision makers from approximately 50 academic and administrative units across the university.

Interviewers- this will require members of the BI Task Force, UITS and others to design and conduct a series of interviews along with analyzing and documentation of the results.

Communication – resources will be required to maintain and continue to develop our communications

Education - resources will be required to maintain and continue to develop our education programs

Future resource requirements

Notably more resources including staff, education, infrastructure & tools will be required during the implementation phases. A budget for the related action items under *Empowering People* was submitted for the technical related resources but it has not been approved. Resource planning will be a significant component identified during development of specific action plans and priorities as outlined in phase three above.

Next Steps

Following approval of the IU BI Roadmap by Executive Leadership, the following steps will be taken

1. Formation of the governance groups;
2. Initial meetings with governance groups to describe the initiative, obtain feedback and guidance, and make necessary adjustments;
3. Development of the needs assessment protocol with the core user-provider advisory group;
4. Conduct or needs assessment (interviews with broad sample of target user group)
5. Analysis of results of needs assessment
6. Identification of action priorities and strategies

While these steps are unfolding, the BI Task Force will create ad hoc task groups to engage with the ongoing initiatives: participant education; communication with the IU community; and



IU Business Intelligence Roadmap

identifying and effecting linkages with ongoing relevant information systems development initiatives

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