

Data Management and Data Management Tools

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As assessment has become increasingly embedded in institutional life the demands placed upon institutions to manage an expanding body of assessment information has increased exponentially. Much of the pressure for data management and reporting has been imposed by various accrediting bodies, and there is no indication that this pressure will abate. The simple fact is assessment in a twenty-first century college or university setting cannot be accomplished without tools to assist in the organization, archiving, and reporting of the data collected during the assessment process, and the choice of data-management tools remains one of the most difficult decisions facing assessment professionals and faculty. Furthermore, the decision, once made, often locks an institution into a potential conflict between the static nature of many management tools and the dynamic needs of an assessment program in the vicissitudinous atmosphere of higher education. The trigger for decision making is all too often an impending accreditation visit or other external mandate rather than a gradual reasoned approach involving all constituents in the decision-making process. Retro-fitting data management software occupies a great deal of the time for most assessment professionals and often the opportunity for due diligence is sacrificed to the time pressures of deadlines imposed by impending external review.

The demand for rapid and reliable data flow in assessing higher education units is no different than the demands placed on units in other industries, and much of what we

do in higher education has been borrowed from industrial models. The following excerpts from programs outside higher education demonstrate this common need.

First, a few general quotes on the efficacy of data-management and management tools.

The complexity of database management needs depends upon the amount of data and whether the data (1) can be stored in a single table, (2) are static or continually changing, (3) are private or must be shared by multiple users, (4) must often be transformed into other formats and reports or juxtaposed with information from other sources, and (5) must be accessed interactively for modeling and analysis purposes (Ferreira, 1990, p. 78).

In order to use data, it needs to be organized for a task and applied to a decision (Green, 1996, p.44).

Silos are created when, in a mad dash to get a new product to market, a distinct and separate technology infrastructure is quickly thrown together. Once a few of these silos invade a business, data integration becomes an all-consuming and costly endeavor. The alternative, however, is a flood of trade errors and fails, leading to an exception-processing nightmare (Guerra, 2004, p. 32).

These quotes demonstrate the commonalities between managing data for decision making in the market place and managing data for decision making in higher education. Though higher education professionals are presented with unique challenges, e.g., students as organic units in a state of quantum flux responding to a myriad of non-educational stimuli, the stakes are the same and many of the issues facing private industry

also face higher education when it comes to selecting or developing a system to manage assessment data. However, the need in each area is equivalent. One cannot collect the massive amounts of data required in the information age without a system to manage these mountains of data.

It is unfortunate that in the current computerized database environment there is no one-size fits all set of data management tools for managing, organizing, and reporting assessment data. The range of options available to an institution spans the spectrum from inexpensive “home-grown” systems to elaborate and often-complex commercial tools. The best one usually hopes to accomplish when conducting a needs assessment or evaluating commercial “out-of-the-box” solutions is gather as much information in the shortest possible time and make a decision taking the “specs” of the software vendors at face value. The list of institutions relying at least in part on home-grown systems is long and diverse and includes Florida Atlantic University, Macon State University, Montana State University, Central Georgia Technical College, and the University of North Carolina, Chapel Hill. The list of commercial systems is also lengthy and diverse. This chapter will refer to many of these as examples in discussing issues, but a list with an overview of capabilities is provided at the end.

In general, commercial or in-house software related directly to assessment is designed to perform one or some combination of the following generic tasks for higher education administrators: 1) manage, organize and report the voluminous documents for discipline-specific or regional accreditation; 2) organize coursework into some type of curriculum map for reporting on the relationship between a curriculum and learning outcomes; 3) act as a repository for and provide connections between strategic planning

goals, learning outcomes, data generated from the measure of learning outcomes, and targets for program improvement. Other data management tools are often used for tracking institutional effectiveness, program review, and annual reporting. The main concern in this chapter is with the third type of software although, as will be seen, some solutions target the first and second purposes and a few commercial products spill into all the peripheral categories listed above.

The purpose here, then, is to provide a shortcut for evaluating such tools by providing a discussion of three fundamental aspects with which one is faced when making a decision about data management software: 1) an overview of the issues facing assessment practitioners, faculty, and administrators regarding assessment data management tools; 2) the pros and cons of these issues with reference to the ability of specific home-grown and commercial products to handle such issues; and, most importantly to department heads, deans, and assessment staff members, 3) lists of the tools available in the context of the requirements of accrediting bodies with reference to data management systems.

Specific issues exist which may drive the decision to adopt or develop a specific data management tool. Two of these issues, cost and integration with existing systems, can restrict options by eliminating existing products and the latter, integration, can preclude the development of home-grown tools depending on the nature of those systems.

The Issue of Cost

The first question most administrators want answered when a discussion of software purchase or development arises is “how much will it cost?” The answer to this

is complicated and should probably be considered last rather than first in the selection process, but budget realities cannot be ignored so it is dealt with up front here.

The first question, barring cost, asked by those making the decisions about data management tools should be “what do we need this data management system to do?” This question most often determines the price one must pay for either the purchase or in-house development of data management tools. In any case, pricing options cannot be adequately presented here for several reasons. This is not an effort to sidestep the issue but rather a product of economic velocity. The price of purchasing or developing software changes rapidly. Currently the cost of existing systems ranges from zero for in-house systems developed by institutions with the available expertise already on staff to hundreds of thousands of dollars for “turn-key” solutions. For example, the Office of Institutional Effectiveness and Analysis at Florida Atlantic University developed a SQL-Server-based, in-house solution using the talents of local staff. The solution is simple and elegant but not as powerful as many commercial systems in terms of its ability to incorporate all aspects of planning and analysis, and its reporting capability is more limited than many commercial products. In contrast systems such as Nuventive’s TracDat and the system sold by Digital Measures, both of which are extremely powerful, are in excess of one hundred thousand dollars. An additional reason for not entering into a detailed discussion of cost is that these prices can be cut by buying multi-year contracts or by individually negotiated contracts.

The bottom line on cost is twofold: first, determine with as much specificity as time will allow precisely what you wish the software to accomplish, and, second, if it is discovered that a commercial product is necessary, look to negotiate the best deal

possible. Other issues institutions should consider when selecting a product or deciding to develop in-house solutions are discussed below.

The Issue of Integration

At some point in the decision-making process the issue of integration with existing data bases will emerge. Outcomes assessment generates only one of many data sets used for decision making. Other processes such as strategic planning, program review, and annual reporting are to some degree connected to assessment data and institutions may wish to integrate these functions to the extent possible in order to avoid redundancy and repetition. If data are dispersed, contained in multiple data-base formats, or, worse still, in disparate silos whose “ownership” is closely guarded integration is a task institutions may not wish to undertake. While this may simplify the selection of an appropriate assessment management tool, it will only add to the existing redundancy to bring yet another software package into the mix.

This caveat aside, many institutions will wish to integrate assessment with other data-management tools, and this will narrow the search since some software will not be designed to integrate automatically with other systems. Most institutions use a central transactional system to manage the business of higher education. Such systems include Datatel, PeopleSoft, and SCT Banner. In order to illustrate the issue, we will examine the case of SCT Banner, a transactional data system used at a large number of institutions. Banner is not considered here as a data management tool for purposes of tracking outcomes assessment. It was developed as a transactional data repository for all facets of the business of higher education, but is too complex and lacks the simple, intuitive

structure for use as a broad-based assessment tool for use by faculty and staff. Before considering a data management tool for assessment, it is imperative to ascertain the primary data management tool extant at an institution for handling the transactions of offices such as the registrar, finance, and student data.

In any case, a few data management tools, e.g., TracDat, Digital Measures, and Survey Dig, are advertised as “Banner Add-ons,” that is, they are designed to take advantage of Banner’s transactional data flow. Transactional for purposes here means data are not archived within the system itself. For example, if a student drops a course and the Registrar deletes that student from the roles, there is no longer an existing record of that student having been enrolled. However, Banner programmers archive periodically in an Operational Data System (ODS) which is the archival record of Banner transactions but is often considered “quasi-transactional” since the archive record is not permanent. Even home-grown systems can take advantage of the ODS by extracting data as needed into the assessment data base in a series of “census dates” for assessment reporting. However, in cases where an assessment is to be applied to existing or in-tact groups, e.g., a survey of all seniors currently enrolled in a specific course or set of courses, one may require the current enrollment from the Banner production server (active server as opposed to, say, a test server into which Banner data are extracted to test the viability of the software connection – data in a test server are not “live” data).

Data management tools designed to integrate with Banner will generally be more expensive than other tools, but they provide more power and flexibility to utilize the thousands of fields residing in a Banner system (the same goes for a Datatel or People Soft system). A few software packages designed to integrate with Banner, Datatel, or

People Soft are TracDat, LiveText, Digital Measures (though data must be first extracted into comma-delimited format), survey Dig, and TK20 (also requiring extraction though there is an effort underway for full integration). For example, Survey Dig and TracDat allow surveys to be distributed to students based on Banner enrollment data. If a survey is to go to students in a specific course or set of courses, it will be distributed on the basis of current enrollment data. Students who withdrew from the course or set of courses will not receive the survey.

The issue of integration should be seriously considered as faculty and administrators research the existing pool of data management tools. The additional cost inherent in integration is often far outweighed by the power and flexibility allowed by integration.

Let us turn now to a series of other issues to be considered when selecting data management tools. These are in no particular order, but each should be given careful consideration.

The Issue of Breadth

Breadth here refers to horizontal integration or the extent to which assessment will permeate other data-driven activities at an institution. In some institutions assessment activities are stand alone operations having little or no overlap with other reporting activities designed to monitor program effectiveness, e.g., strategic planning, program review, and annual reporting. However, in the most forward thinking institutions assessment has been woven into the fabric of data reporting and helps provide additional information on the quality and effectiveness of programs. This latter approach,

one of maximum horizontal integration, is the preferred mode of operation, but it is often quite difficult to achieve. Having a data management solution capable of facilitating the integration of assessment with other data bases and reports is an effective means of making assessment a truly embedded process upon which decisions are made.

The means by which assessment becomes integrated into other reporting processes is varied but is most often driven by the data-management system itself. This makes the decision of such a system all the more important to institutions not locked into reporting silos. The destructive force and lack of cross-communication of data silos is also far more easily overcome by introducing new data-management tools which trump existing systems.

For example, while Banner is a behemoth with thousands of relational tables (relational in its most simplistic form refers to the ability to extract data from many different data tables into one “flat file” usually by identifying a common “primary key” or data point contained in all relational fields) containing the target data fields, it is often the case that Banner programmers report to specific administrative staff who “own” the data controlled by that programmer. There are often communication problems across programmers because of the nature of “Banner code,” and if the institution lacks a data-sharing culture problems in communication may be exacerbated. Having a data management tool for assessment capable of integrating with the transactional system whether it be Banner, Datatel, People Soft or some other system at least to the extent that data required for outcomes assessment are regularly extracted into the assessment data base may help overcome obstacles to cross-communication.

The trade-off here in terms of pros and cons is simple. The more breadth contained in the assessment program, the more integration will be needed, and the greater the potential cost and complexity of a data-management system. However the reward for breadth is a vibrant, organic assessment program that may become a true outcomes-learning, quality-control mechanism.

The Issue of Local Adaptability

Related to the issue of integration is the issue of adaptability of data management tools to existing data sources. This may be deemed the opposite problem of data silos in that sharing rather than ownership is the key issue. Every campus has legacy data bases with data of historical interest that should be retained when a new management package is launched. As part of the data-management selection process, an audit should be conducted to identify these resources and to select a data-management package that best facilitates the importation of these legacy data. Representatives from each major area of the campus should understand the choices and have the opportunity to put forth data for inclusion.

The Issue of Depth or Level of Disaggregation

Depth refers to the vertical integration of an assessment program. Disaggregation is a subset of depth in that it is level at which one wishes to group data ranging from institutional level down to the school or college, unit, or individual student level. Assessment activities may hover at the programmatic level with the unit of measure aggregated at the depth of the academic department or major, the euphemistically termed

“view from 5000 feet,” or it may descend deeper into programs with the individual student as the unit of measure, the “view from the weeds.” The depth of assessment will often be dependent on external factors such as discipline-specific accrediting bodies. For example, the Association to Advance Collegiate Schools of Business (AACSB), the main accrediting body for Colleges or Schools of Business mandates assessment at the programmatic level while the National Council for the Accreditation of Teacher Education (NCATE), the major force in the accreditation of Colleges or Schools of Education, demands assessment at the level of the individual student in such activities as critical classroom assignments. This distinction may be seen in the language of the standards of the two organizations. For AACSB, “the accreditation unit is the institution (AACSB Standards, 2007, p. 3).” For NCATE, “the system of assessment and unit evaluation...should generate candidate assessment data, as well as evaluative data related to unit policies and procedures (NCATE Standards, 2007, p. 2).”

The requirement for institutions to maintain student-level data is a current controversy with forces in the Department of Education, e.g., Spelling’s Commission, pushing for student-level disaggregation while regional accrediting bodies are resisting such pressure. However this remains a potential far-reaching policy change that has gained momentum with an increasing demand for consumer-driven education. Regardless of which side of the argument an institution places itself, the choice of data-management tools will be different if a school/college or academic unit is faced with student-level outcomes assessment requirements vs. those who wish to manage data at the unit level or above. For example, management tools such as WEAVE Online or Digital Measures are designed as unit-level data repositories while those like rGrade and

TK20, originally designed for Colleges or Schools of Education, are designed to track outcomes assessment at the individual student-level.

The pros and cons are straightforward on this issue as well. The more vertical integration an institution wishes, the more specialized will be the choice of data-management tools. At the current time cost of data-management tools do not fluctuate greatly around the issue of vertical integration. It is more a matter of choice than of cost. However, there has been resistance among some faculties who view disaggregation at the individual student level with some trepidation. An oft heard fear is that individual student level data could be used as a means of evaluating faculty performance. This issue, therefore, brings up a subsidiary issue, that of faculty trust and faculty involvement. Software solutions selected by institutions without considering these two issues, faculty trust and involvement, may be doomed from the outset.

The Issue of User Friendliness or Ease of Use

Problems of user friendliness can continually haunt the careless selection of a data-management tool. If the decision is made that the data-management software will be used by the faculty and staff at large, one must take great care to select a tool that has the shallowest learning curve possible while still retaining the power necessary for tracking outcomes assessment. Many tools, commercial and home grown, were designed by programmers or other technical personnel who are already intimately familiar with data bases and for whom most software appears intuitive. However, one must imagine the typical Shakespeare scholar sitting before a computer screen facing a complex set of

icons and menu items the names of which elude all but the computer savvy to imagine the problems which can ensue in convincing all to populate the data base.

Therefore, whether selecting data management software solely for outcomes assessment or for broader use in annual reporting and program review, the following rule must apply: *select a data-management tool with the **least** sophisticated user in mind.* Many software packages for outcomes assessment have recently undergone sweeping upgrades because the early versions were not intuitive and were in essence abandoned by the faculty. LiveText, rGrade, TK20 – Campus Tools – Campus Wide, and WEAVE on-line are examples of data-management packages undergoing radical face lifts as the result of user feedback.

In the past it was often said that the easier a software package was to use, the less powerful it must be. This tenet no longer holds in the modern computer era. One has only to recall the earliest versions of word processing software to grasp the new approach to computer technology. Modern word processors have become increasingly intuitive and yet have undergone an exponential increase in flexibility and task complexity. The same evolution is beginning to occur in the data management arena. Add to this the commonality of backward compatibility (new versions capable of importing old data), and one can find an array of strong data management packages available. However, this does not mean all management systems are equally user-friendly. As part of the due-diligence process, it behooves administrators faced with the choice of an outcomes assessment management system to involve faculty and key staff in the selection process.

The Issue of Interactivity

The issue of interactivity centers on the question how many faculty and staff will use the data-management system and for what purposes? Many data management systems have elements of both a passive data repository, e.g., WEAVE on-line, as well as an interactive teaching system, e.g., Blackboard. Faculty and students co-interact with Blackboard during the course of a semester. Faculty post syllabi, manage a message board, and post grades while students submit homework, written assignments, and take tests. The potential for such usage may play a large role in the data-management system selected for a campus.

The decision to select a more interactive system may have much to do with the discipline-specific accrediting body as in the case of NCATE. Since NCATE mandates a view of outcomes at the individual student level, many Colleges or Schools of Education have opted for a more interactive system. For example, rGrade and TK20 allow faculty to connect learning outcomes to standards, score assignments using embedded rubrics, archive learning artifacts, post scores, and many other classroom management activities all from a single page of icons.

It may be that the industry is witnessing a convergence of purpose when it comes to the construction and use of a data-management system. For example, Blackboard, designed as an electronic classroom management tool, has recently entered the market with a planning and outcomes assessment management module while systems such as rGrade, designed as a planning and learning outcomes management system, had evolved into a system to be used as a classroom management tool as well. In some ways this

simplifies the process of selecting a data management system since existing systems will undoubtedly continue to evolve into more robust all-purpose software packages.

In the meantime, it again places pressure on those charged with selecting such systems to carefully audit their proposed usage in order to reduce the purchase of additional systems to fill in gaps left by the changing needs of users. If possible one should attempt to avoid the myopic error of being faced with the task of justifying additional expenditures from lack of due diligence at the outset.

Additional Considerations

The purpose of this chapter thus far has been to identify some key issues relevant to data management systems designed for outcomes learning and assessment. Before proceeding with a list of some of the data-management systems available, there are features available in some systems that one might wish to consider before making a final selection. Some of these features have been touched on above, but it will be helpful to those charged with the selection of a data-management system to elaborate briefly on the capabilities useful when attempting to discriminate one system from another. This section deals with four of these features: 1) the management of strategic planning; 2) curriculum mapping; 3) web functionality; 3) test/survey builders; 4) accreditation compliance features; and 5) customized reporting.

Strategic Planning and Data Management Systems: Closing the Loop

As mentioned above, the incorporation of outcomes assessment strategies and data into existing or inchoate strategic planning initiatives should be a fundamental

characteristic of any sound assessment management system. Accrediting bodies are becoming increasingly demanding when it comes to what the Southern Association of Colleges and Schools (SACS) calls “closing the loop.” By this they mean colleges and universities must demonstrate a seamless planning, evaluation, budget cycle. It is incumbent upon an institution to demonstrate that the highest planning goals filter down through programs and are measured at the programmatic level resulting in program improvement based on budget initiatives targeted at weaknesses. In this regard assessment is part of the larger evaluation process along with program review and the unit-level annual reporting cycle.

Some data-management systems are designed for this purpose while others are not, or, at the very least, must have their capabilities retro-fitted to perform this task. Digital Measures and Trac-Dat are two systems that target this purpose while others such as TK20 and WEAVE on-line have attempted to add modules to assist in this broader program effectiveness process. There are home-grown systems designed with this purpose in mind as well. Since this capability will continue to grow in importance, it should be considered during the system selection process as a key feature.

Curriculum Mapping

The purpose of curriculum mapping is to evaluate the extent to which the learning objectives of an academic program are aligned with the courses in the curriculum. Some have dubbed this a “deliver forward/design backward” technique since the starting point in the design are the outcomes which are mapped back to the curricular structure which is then delivered to students. It focuses on the relationship between student classroom

behaviors and faculty expectations by creating a matrix of course objectives crossed with program goals and outcomes. Some of the broader, commercial data-management software packages, e.g., WEAVE online, Curriculum Mapper from Collaborative Learning, Inc., Atlas Curriculum Mapping, TechPaths, and TK20, have developed curriculum mapping modules to facilitate this process. There are also a wide variety of homegrown systems to facilitate curriculum mapping.

There are some potential pitfalls in the use of such procedures. While curriculum mapping can be a potent tool for curricular design, many in higher education believe such procedures are yet another camel's nose under the tent of autonomous curricula in higher education. Some members of the faculty view a completed curriculum map as suspiciously similar to imposed standards in K-12 resulting from the No Child Left Behind mandate. This negative response is reinforced by a perceived homogenization that takes place when course are "force fit" to a common set of learning outcomes especially if those outcomes are mandated as they are in many states, e.g., Virginia, Florida, and Texas. Furthermore, there is a learning curve in curriculum mapping and the process can be somewhat time-consuming if done carefully.

However, as a tool for curriculum alignment with learning outcomes curriculum mapping provides a valid solution by providing a thorough organizational scheme. Accrediting bodies find the output from curriculum mapping particularly helpful during reaccreditation reviews.

Web Functionality

Some of the most powerful data management systems are web-based, and, while this would seem to make them all similar in functionality, there are important considerations when examining these packages for integration into campus systems. A few of the more important considerations are the following:

- Client-side versus remote-server systems
- Potential integration into existing systems
- System-wide technical issues
- Client-side technical issues

This list is not comprehensive nor is it in order of importance. An essential rule in the selection process of an institution-wide data management system is this: *involve members of the technology staff in the decision process at the outset of the selection process.* This seems a self-evident aphorism, but it is remarkable how many software programs are purchased before vetting by the technical staff. As the following discussion of the technical considerations will indicate, each institution's technology has evolved differently and a data-management system that is good for one institution may be anathema for another. Some institutions are highly centralized while others are more diffuse, some have silos with little inter-communication while others have open communication, central operational systems vary, e.g., one institution uses SCT Banner, another Datatel or PeopleSoft, some have on-site help desks while others have outsourced, and so on. The discussion here is merely indicative of some of the issues a selection

committee may encounter, and its purpose is not to be inclusive but to reinforce the need to involve technical staff in the process at the earliest point possible.

Issue One: Client-side versus remote-server systems

Many of the most powerful commercial data-management systems are housed on remote servers and controlled by the technical staff employed by the vendor while others are housed on local servers. Digital Measures and WEAVE on-line are examples of vendors using their own remote servers while r-Grade is an example of locally housed servers. There are benefits and liabilities in each method.

Advantages of a remote-server product center on the fact that most institutional technical staff are quite happy to see systems run on remote servers controlled by the vendor. It is, in short, less work for the local IT staff. The vendor is responsible for the servers and any crashes, upgrades, data back-ups, security issues, etc. are problems for the vendor not the local staff. This lack of drag on local productivity is of great benefit. Furthermore, the vendor-controlled system is normally targeted at the data-management system and does not perform the broad array of tasks required by local systems. Therefore, there are several important potential benefits to vendor-controlled systems: 1) lack of drag on productivity; 2) usually lower personnel costs at start-up; and 3) targeted response teams controlling the product and providing focused expertise.

However, in order to take advantage of the potential benefits of a remotely-managed system selection committees have a greater burden in the execution of due diligence during the selection process. Here are a few of the

critical questions vendors must answer to the satisfaction of the IT staff. Some of these questions have been dealt with previously in this chapter, but reiteration here is important.

- Who owns the data? Institutions must assure that they have access to download and retain data on demand. The methods and opportunities for local data backups should be part of the contractual arrangements. Should the contract lapse it could be disastrous if the institution did not have control of its own data.
- How are data secured? Security is a twofold issue in that the vendor must secure both the data as it is sent to the remote servers as well as secure the data once it is resident on the servers. Most vendors use Microsoft's Secure Socket Layer to transport data in encrypted format (this is denoted with the "https" rather than the standard "http" on the URL line of the browser), but this must be verified. Once data are on the server security is equally as important. An example of excellent security precautions is Digital Measures which has contracted with IBM to store data in the super-secure Iron Mountain site. Vendors should specify security measures as part of their demonstration.
- Will the system integrate with local data bases? This question was introduced earlier in the chapter, but it is now viewed from the perspective of web functionality. In this context the question is twofold: first, does the institution wish the web-based assessment management software to integrate with existing systems and data bases? On some campuses it may

be that assessment is a stand-alone process and the software adopted will only be used to manage outcomes assessment. If this is the case, then integration is irrelevant. However, it is more likely that the institution would like to work toward streamlining assessment and integrating it with other activities. If this is the case, then the question here is more, how much work must be done to integrate existing software with a new web-based system for management of assessment data? Some vendors, e.g., TK20, advertise a seamless integration with many existing Student Information Systems such as Banner, Datatel, PeopleSoft, and Jenzabar. If such integration is desired it is all the more reason to include key IT staff members on the selection committee to ask detailed questions regarding integration issues.

Integrated Test/Survey Builders

Several data management tools, e.g., TK20 and LiveText, have a built-in survey construction feature. While this is a desirable addition to any data management software package targeted at assessment professionals there are again pros and cons to these features, and institutions must decide beforehand the purposes for which the test/survey builder will be used. Most of the extant test/survey builders are targeted for web delivery, so one should refer the section above as well as review the issues below. The following are examples of questions that may arise when reviewing test/survey features.

- *Faculty/Student Evaluation:* Will the survey feature be used for such purposes as faculty or student evaluation? If so, several potential problems must be anticipated. First, it is almost a must that the software integrate seamlessly with existing student information technology, e.g., Banner, Datatel, and PeopleSoft, so that live student enrollment data can be paired with the survey. TK20, LiveText, and Survey Dig perform these tasks though Survey Dig is exclusively an add-on survey package. A work-around for this is to perform an extraction from the student-information system immediately prior to the evaluation period, but this can be labor intensive. Second, the survey software must allow for multiple instructors in the same course, e.g., team taught courses. Some survey software, e.g., Survey Dig, do not easily perform this feat while others, e.g., Flashlight, allow for multiple instructors. Third, the survey software must provide secure delivery of data back to individual instructors after the evaluation period. Most packages perform this task easily though the reporting features vary and should be reviewed before a decision is made regarding the package one will use.
- *Single-Correct Response or Power Test Features:* Will the software be used to create tests with a single correct response, e.g., a test of critical thinking. If the answer is yes, one must assure that the software is capable of this task. Survey Dig does not easily

lend itself to this task while a product called Inquisite has this feature.

- *Subtest Scoring*: Will the software be used for multiple scale tests, e.g., personality inventories such as the Myers-Briggs Type Indicator? This is one of the most difficult features to find in a survey package and it is often necessary to either purchase software directly from the test producer or send data to the test producer for scoring. There is no one-size fits all solution for this feature.
- *Other issues*: Other questions that should be asked when selecting built-in test/survey features include the following: Will a centralized office, e.g., assessment office, be the primary test design center or will individual departments or other cost centers use the software? If the answer is a decentralized use, ease of use is a must. Will the data from the test/survey be disseminated widely? If yes, a sound reporting feature is necessary. Will the tests or surveys be administered to students prior to arrival on campus, e.g., entering student goals inventories? If yes, the institutional IT office must arrange for secure dissemination.

Accreditation Compliance Features

An institution seeking an assessment data-management system may want the capability of performing accreditation audits and in managing the myriad chores

surrounding the accreditation or reaffirmation process. Some tools, e.g., Dataliant, are targeted specifically for this purpose while others, e.g., TK20 and TaskStream, assist with the accreditation process as an added feature. These latter programs tend to be less robust than targeted packages but the fact that they perform this along with many other tasks necessary for assessment and institutional effectiveness may make them attractive options. Some accrediting bodies, e.g., SACS, are amenable to the use of software packages that provide clear presentation of outcomes assessment and the planning, evaluation, budget cycle. Committees tasked with selecting an assessment management system might wish to seek input from institutions with successful reaffirmation records for advice regarding the software applications that were of assistance in the process.

Customized Reporting Features

Regardless of the robustness of a data management system in terms of the depth or breadth of its capabilities it will not be able to support institutional programs adequately unless the data can be extracted in a meaningful and user-friendly manner. In the final analysis it is the ability to report information in a variety of meaningful ways that defines the outcomes assessment movement. Reports must be tailored for a wide variety of audiences from accrediting bodies and state governments to Boards of Trustees/Visitors and, of course, to individual students, the ultimate constituent. Therefore, it is essential that during the selection process great attention be paid to precisely what reports will be generated and in what formats.

The difficulty in selecting a data management system lies in balancing the need for tailored reporting with all the other tasks required of a broad outcomes assessment

program. While some packages, e.g., Digital Measures, has extremely powerful reporting capabilities and can be tailored to the individual departmental level, it may not prove to be adequate for other aspects of outcomes assessment, e.g., built-in surveys. Again, it is essential that institutional selection committees consider the flexibility in reporting of the package chosen for institution-wide use. The following are some of the considerations separated by potential areas of use:

- Institutional Effectiveness Offices: Will the software be used to support reporting calendars and other standard reporting sequences?
- Academic Schools/Colleges and Departments: Will the software be used for annual faculty activity reporting? If so, who will enter these data? Will the software be used for annual department reports and program review?
- Academic Support Programs: Will the software be used to deliver student data such as schedules and degree audits? Will the software be used to create annual productivity reports including such data as facilities usage?
- Other Uses by Constituencies: Will reports be posted for viewing by prospective students and parents? Boards of Trustees/Visitors? External agencies?

Answers to these questions will in part determine the reporting power of the data management tool selected.

The author suggests reviewing the following list of commercially available products. The list is not in any order of preference.

- *Digital Measures*
- *TK20*
- *LiveText*
- *WEAVE on-line*
- *Dataliant*
- *TaskStream*
- *Think (Education Solutions)*
- If individual student tracking is a desired feature add *rGrade* and *True Outcomes* to the list.

This list is by no means exhaustive, but reviewing powerful data management software is akin to shopping for a house. After half a dozen or so, they begin to run together and it is difficult to remember which house had what features.

If one is seeking curriculum mapping tools to augment a home-grown system, there are dozens of home-grown products out there including ones at Hillsborough Community College in Florida, Montana State, Central Georgia Technical College, Tidewater Community College in Virginia, University of Nevada-Reno, Middlesex Community College in Massachusetts, and Santa Fe Community College in Florida.

There are also some commercially available curriculum mapping systems at the following web sites: <http://www.cilhome.com/cm>; <http://www.rubicon.com>; and <http://www.techpaths.com>.

The lists above should provide faculty in criminal justice programs a broad base of solutions from which to choose. If the issues outlined in this chapter are considered and balanced against cost, the result will be due diligence and a powerful data management tool to enhance the productivity of criminal justice programs.