DRAFT
Rutgers University Senate
Budget and Finance Committee (BFC)
Report and Recommendations on
University Information Technology
March 2012

1. The Charge

S-1103 - Information Technology and IT Services at Rutgers:

Evaluate aspects of information technology services at Rutgers including whether systems communicate effectively with each other, incorporate user experience levels and feedback, are user-friendly, improve data flow, and enhance coordination among information technology personnel. Explore ways that the Office of Information Technology can more efficiently provide services to users. Identify opportunities for Rutgers to centralize or take a more distributive approach to various information technology functions, and investigate the advantages and disadvantages of deploying more open software. If developments during the time of deliberations warrant it, consider the ramifications of a reunification of Robert Wood Johnson Medical with Rutgers New Brunswick on the above. Respond to Senate Executive Committee by March 2012.

2. Process

The Senate's Budget and Finance Committee (BFC) formed during the AY 2009-2010 a special subcommittee on information technology (IT) to carry out the charge detailed in 1 above.

The gathering of evidentiary matter derived primarily from interviews with University officials in the Office of Information Technology headed by V/P Dr. Donald Smith and directors of department or school information technology units. In addition the subcommittee considered the input of members of the BFC committee and the Senate's faculty cuscus. On a more informal basis the subcommittee also considered the opinions of many in the University community including faculty staff and students.

The information, help and support received from these colleagues is gratefully acknowledged. Unless explicitly quoted, we cannot separate the committee's opinions and suggestions from those brought to our attention by others, and we assume the responsibility as if they were originated by us.

3. Scope of the Charge

The scope of this charge is broad because information technology services directly affect virtually every member of the University community. Currently, the responsibility for providing information technology services is divided between the central Office of Information

Technology (OIT) and local providers centered primarily in academic units, schools, centers and departments. OIT is the main service provider to the University's central administration in New Brunswick, Camden and Newark. This includes the maintenance of a substantial investment in hardware and software for both administrative and instructional purposes. It also functions as the primary nexus between the University's systems and the external environment. Its influence is further exercised through its involvement in systems planning and evaluation and its involvement in the budgeting for maintaining computer capabilities.

The focus of the department and school IT units is much more constricted than that of OIT. These units usually provide generic email services. They often concentrate on acquiring and servicing unique information technology resources that are highly germane to the research and teaching needs of their customers.

 With automation individual efficiency has generally gone up while the cost of generating and sharing information has gone down. Paradoxically, however, the costs of providing an information infrastructure for Rutgers have risen sharply. Part of this is simply owed to the expansion of the size of the university in recent years. Part of this is because of the increasing cost of competent personnel to man systems. The scale of information technology as an adjunct to teaching, research and administration has grown with the rapid development of new and useful software applications. The burden has increased also because of the relatively fast pace of innovation that soon makes obsolete earlier information technology equipment and infrastructure.

While major challenges will continue to confront the University in defining its future information technology policies, the subcommittee believes that staff-faculty interaction related to these matters within the context of the Senate's general oversight role would be strengthened by increasing transparency by following our recommendations.

The following section details some of the more important findings that came out through the field interview process.

Field Interview Findings

1. **System Communication:** Linkages connecting many major communication systems at Rutgers are not highly developed. This lack of integration is largely a function of the fact that different systems were acquired from different vendors at different times. This seems to have been the case for large, administrative IT systems like RIAS of Human Resources, RIAS of Purchasing, RIAS of Budget and Finance and the Student Information System.

   The lack of system integration creates two problems that most notably affect the communication between peripheral and central administration systems. Such systems are not synchronized continuously in real time. Instead, systems are usually synchronized once every 24 hours. Because of this delay the information available to system users may

sometimes be insufficiently updated for the purpose of decision making. Second, because of these circumstances end users have often been compelled to bear the costs of developing shadow systems to compensate for the lack of direct connectivity. .

2. **Data Flow Access:** Data flows can be adversely affected because of either system connectivity limitations or of administrative strictures. Our interviews discovered that many data users generally wanted freer, more direct access to data streams and the minimization of both connectivity and administrative constraints.

3. **IT Personnel:** IT personnel can be hired either by OIT for the central data processing operations or by individual units that support the requirements or particular departments, programs or schools. With the on-going installation of Dell KACE software, OIT will be able to develop a complete roster of all IT employees throughout the entire University including those engaged by the semi-autonomous units. However, decisions about qualifications, salaries and other personnel standards remain unit responsibilities. Many of the IT directors mentioned the good and open and fruitful communication with the V/P Donald Smith, head of OIT.

4. **Centralize or Distribute IT functions.**

Because of the diversity of the academic and administrative informational needs vary greatly at Rutgers, the needs to be some degree of distribution of authority for acquiring IT resources that are specific to the teaching, research and administrative missions of specific units. Nevertheless, important advantages also accrue from the centralization of IT at giant institutions like Rutgers. Central coordination may strengthen operational efficiency in three ways.
I: Centralized purchasing of large lots of standard equipment or license contracting may benefit from the negotiation of larger discounts than achievable through the independent action of small units.
II: There may also be economies from the transfer of local learning about improved operating procedures to other IT units within the University through the meeting of centralized committees dedicated to identifying and promoting best management practices;.
III. The centralization of access to large, efficient data processing equipment may provide economies of scale to system users, reduce local unit support costs and assure stronger system security.

Because of cost considerations some services should remain centralized. This includes hardware part of university network and internet connection and Information Protection Services (IPS). However, although IPS security and safety policies and directives may be excellent, ultimately their effectiveness depends on the degree to which they are implemented by the various operating units within the University.

5. **Open source software.**
   The principal advantage of open source software is that consumers are not charged for its use, although some systems depend on the voluntary involvement of users in extending applications. Although developmental costs may be incurred in these arrangements, these expenditures are generally limited to applications that are vital to the participating institutions, . Users modify programs to satisfy specific operating needs. Today, one can find many open source programs that might serve as good substitutes for licensed (for pay) programs. The most discussed example at RU is commercial Blackboard software and the open source, Sakai software for course management. Blackboard is ordinarily used Newark while Sakai is supported by the OIT in New Brunswick. Technology users and consumers remain divided over the relative merits of commercial and open source software for University applications. The following is a short list of pro and cons of the two options:
   a. Open source codes are easily accessible and thus more susceptible to intrusion by unauthorized agents..
   b. Open access is improved "locally" to better satisfy the unique requirements of "local" users.
   c. The responsiveness of commercial software suppliers to provide system support has generally been highly.
   d. At the IT director level, no <u>formal</u> support system to open source programs is available. There is a greatly appreciated and free "community support" but no binding commitment for fast workable solutions.
   e. While the commercial provider is faster with integrating new capabilities into their product, such action may impose significant "retooling" costs on users.
   f. The cost factor: The cost of operating Blackboard is unambiguously stated in the contract with commercial technology providers. However, the "full" cost of the open source program Sakai, must also consider the expenditures incurred in customizing its capabilities to the special requirements of the Rutgers community. Although there is a sizeable time and cost uncertainty involved with the user modification of open source software, the cost of open source is generally estimated to be in the range of 66 to 75 percent of commercial alternatives.

6. **Ramifications of of Roberts Wood Johnson Medical School merger**

No specific information about the IT systems currently used by Roberts Woods Johnson Medical School has been made available to the subcommittee. Because of the size and complexity of the medical school and the uniqueness of its organization, the problems of systems integration and finance in merging with Rutgers University should be included on a future committee agenda. .

4. Recommendations

1. <u>The creation of focus of interaction between OIT and service consumer groups throughout the University.</u>

At this time the interaction between OIT and the directors of the various school or department IT departments seems to be functioning effectively. However, there is no mechanism in place for regular feedback from non-specialist consumers whose work is impacted in significant ways by IT. These challenges might be met through the formation of a permanent liaison between the Senate and OIT whose purposes would be to function as a forum enabling consumers to surface their concerns about IT.

2. <u>Utilization of new sources of information available through the installation of Dell Kace software.</u>

This makes possible a complete survey of all equipment and programs operating with the Rutgers University network including those maintained by the special department and school IT units. In addition it provides statistical data about system usage. This valuable resource could inform the creation of an annual almanac that provides a detailed profile of Rutgers IT activities. Its insights would, doubtless, facilitate systems planning by illuminating critical operational elements such as major usage patterns or the existence of significant network obsolescence and hardware and software redundancies. Such data could also be used to update the RU 2000 report which provided a comprehensive view of the evolution of IT development at Rutgers up until that time. It could also serve as a source for the definition of useful benchmarks for making comparisons against prior year performance as well as cross comparison against the state of practice at other universities.

3. <u>Formation of technical committees composed of technology providers and users to address the problem of how bottlenecks and rigidities associated with the use of generalized application software might be surmounted</u>.

Rutgers, like many other universities, depends on generalized software programs for many administrative applications which lack sufficient flexibility to accommodate unique, school-specific circumstances. The surmounting of such barriers requires both knowledge of technology

and management-planning, two types of expertise not always readily accessible within the Senate community. The Senate's role in this case would be primarily related to monitoring developments, perhaps, through the liaison arrangement outlined in recommendation 1.

4. <u>A need for a more explicit and transparent policy with respect to information sharing.</u>

The efficient utilization of IT resources within the University community would benefit from the fuller explication of rules concerning access to common software. This would involve the definition of better guidance with respect to who is privileged to gain access to what specific data and for what time period.

5. <u>The development of a master plan or strategy with a 5-year time horizon as a mechanism useful for financial planning and also for assuring highly level of effectiveness in system design.</u>

What is contemplated is an annual document which provides a succinct overview of the main programmatic directions of IT services for the short and medium term. It should primarily reflect the initiatives of OIT but should also provide insight as to the plans of the semi-autonomous computer service units. A good model for such a document would be the earlier report entitled

"RU 2000."

6. <u>With the instillation of the Dell KACE software OIT has the opportunity to increase the scope of its system advisory service to the semi-autonomous data processing units that permeate the University.</u>

The Dell KACE system monitoring software creates an opportunity for OIT to advise peripheral units on system design, security and safety, perhaps, through the agency of a periodic system audit. The focus of such studies could also encompass the assessment of operating costs and technology investment. It could also include the definition of personnel skills requirements to assure competent and efficient functioning.

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