The Year 3 (2009/2010) Addendum to the

"3 Year Information Technology Plan for BCIT"

(Original was published: November, 2007)

2009/2010 Addendum - Table of Contents

This addendum to the "3 Year Technology Plan for BCIT" which was originally published in 2007/2008, is an interim annual update to that document. A more comprehensive rewrite is expected every three years. For each of the 2 interim years, the document will be supplemented with an abbreviated addendum that will focus on specific sub-sections of the original plan.

For 2009/2010, the following sections will be reviewed and updated in this addendum:

1) **Project Organization:** This section outlines the overall project scope, rationale, and approach for this interim release. This is taken primarily from the IT Services Project Charter for this interim publication which was identified as a "Rally Point" project for 2008/2009.

2) **Revised "As Is" State:** This section will be updated to reflect changes to the current "As Is" environment over the 12 months since the original 3 Year Technology Plan for BCIT was published. These changes are both as a result of roadmap initiatives identified in the original 3 Year Plan, as well as changes that are the result of other strategic initiatives and operational activities to ensure the reliability, robustness, and currency of our services, infrastructure and application systems.

3) **Revised and Selected "Environmental Scans":** For the 2009/2010 addendum to the 3 Year Technology Plan, 5 specific areas have been identified for the focus of the Environmental Scan activities. These include:
   - Cloud Computing (SaaS)
   - Evolving End Devices (PDA's, Smart phones, Laptops/Desktops, Netbooks, electronic paper, pocket projectors, etc)
   - Virtual Communities
   - Technology Trends in Higher Education
   - Sustainable Technology

4) **Revised "Roadmap Initiatives" :** The Roadmap Initiatives that were identified in the original 3 Year Technology Plan were parsed out over a 3 year horizon. These initiative are meant to help close the gap between the "As Is" state and the desired "To Be" state. Progress against the year 1 & Year 2 initiatives will be reviewed, and the 3 year window will slide forward to include the 2011/2012 year.

The Year 3 Addendum to the

"3 Year Information Technology Plan for BCIT"

"Project Organization"

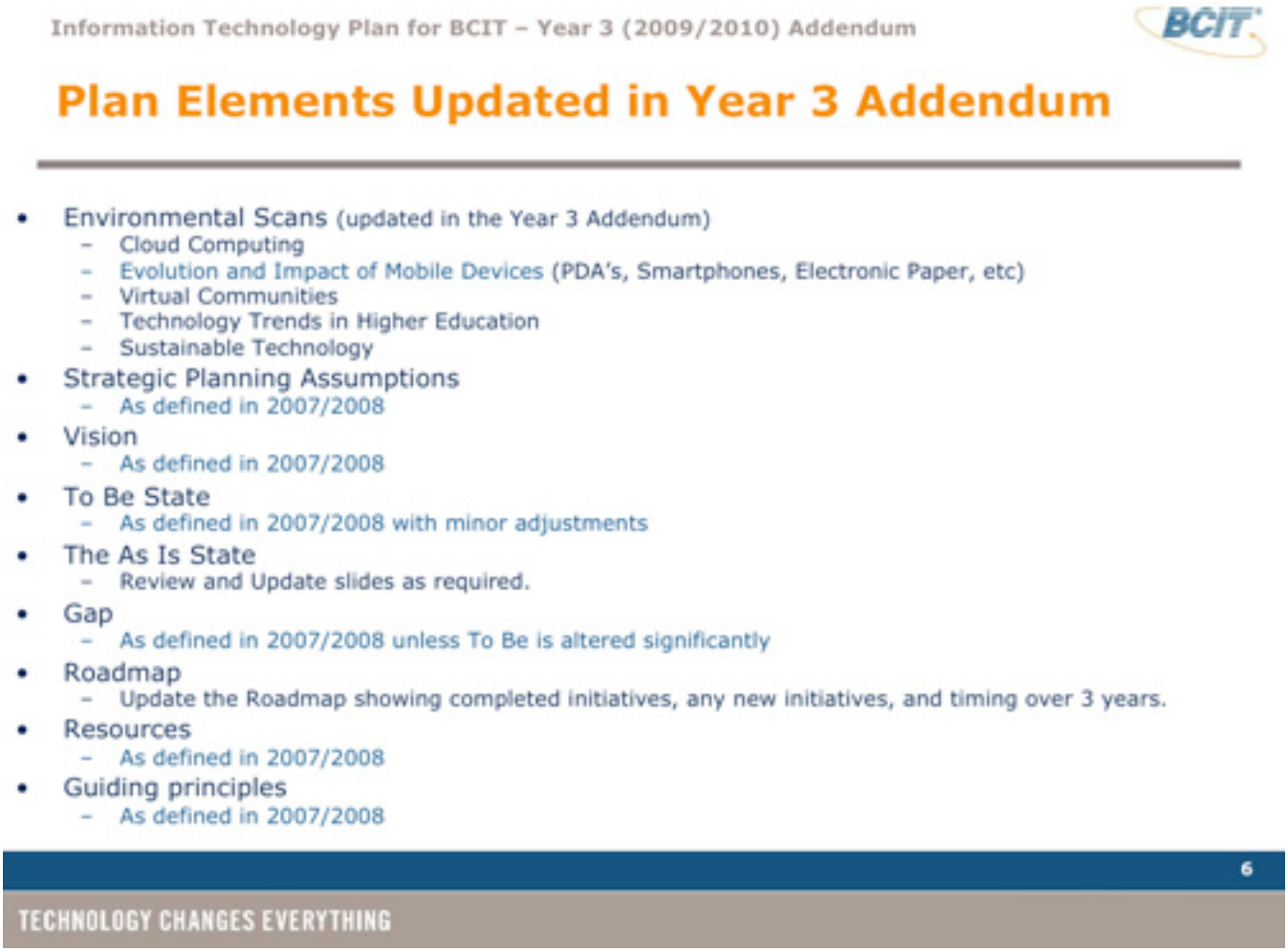
This section of the addendum will provide information on the processes, overall rationale, scope, and deliverables. This has note changed materially since the original Charter and project to create the 3 Year Information Technology Plan for BCIT in 2007.

Technology Plan Structure

Areas Updated for 2009/2010 Addendum

The graphic above describes both the components of the planning process, as well as the overall approach.

The areas circled with a 'buff' coloured fill are the areas that will be addressed and updated in this Year 3 Addendum to the 3 Year Information Technology Plan for BCIT.



The information above identifies the "vintage" of the information contained in each of the components of this document. In the case of the Environmental Scans, 4 of the 5 areas are new for this year's addendum document. The only Environmental Scan area that is not new for this year is the "Technology Trends in Higher Education". That is being repeated and updated from previous iterations. Other components have either been updated as indicated, or have retained their original information from the initial "3 Year Information Technology Plan for BCIT" published in November of 2007.

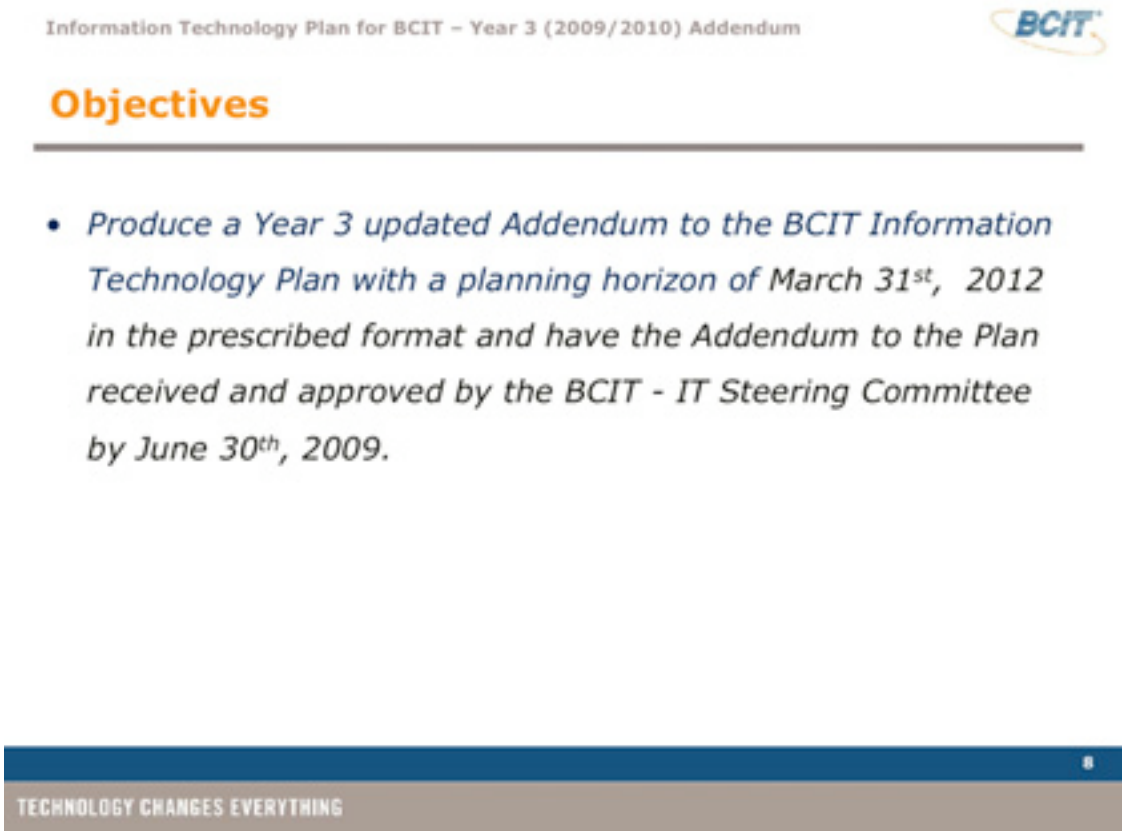
This Year 3 Addendum is required to:

a) ensure that IT Services continues to be aware of, and align with the business and academic needs of the Institute

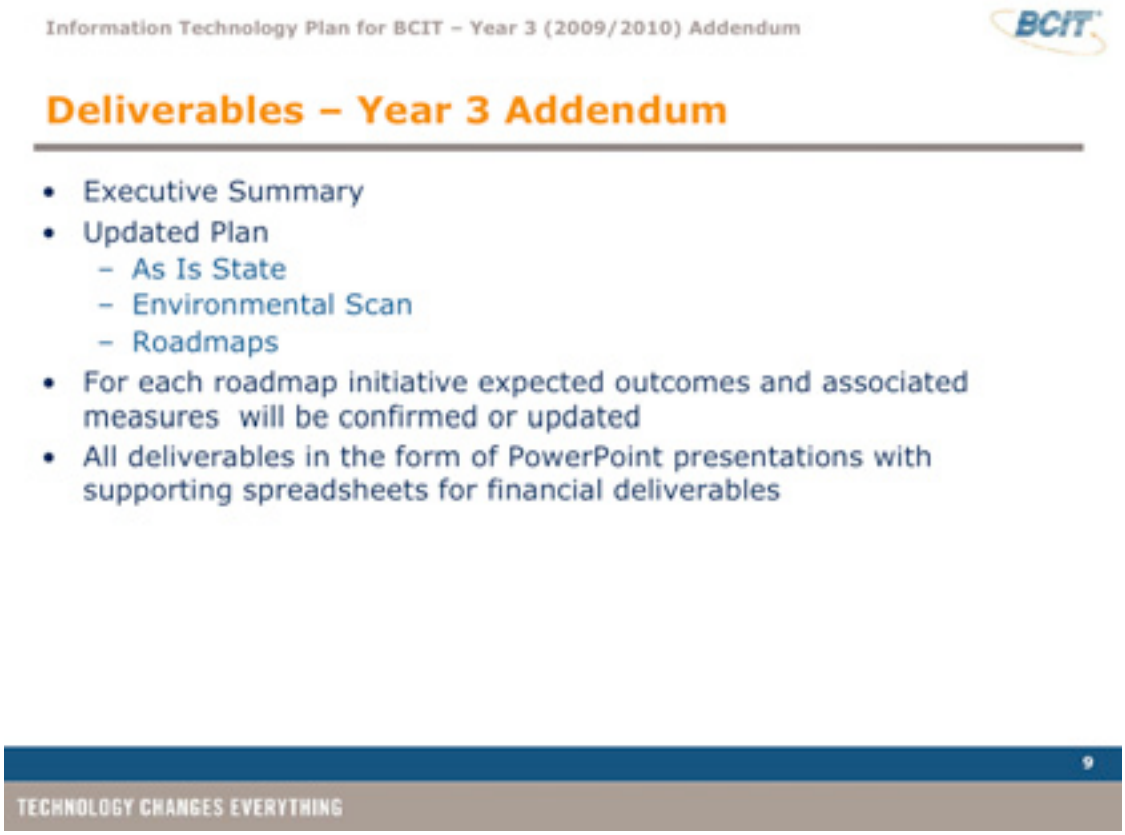
b) keep the 3 Year Technology Plan alive by continuously updating it annually, providing a constant 3 year horizon of planning

c) ensure that any new opportunities are integrated into the 3 Year Information Technology Plan

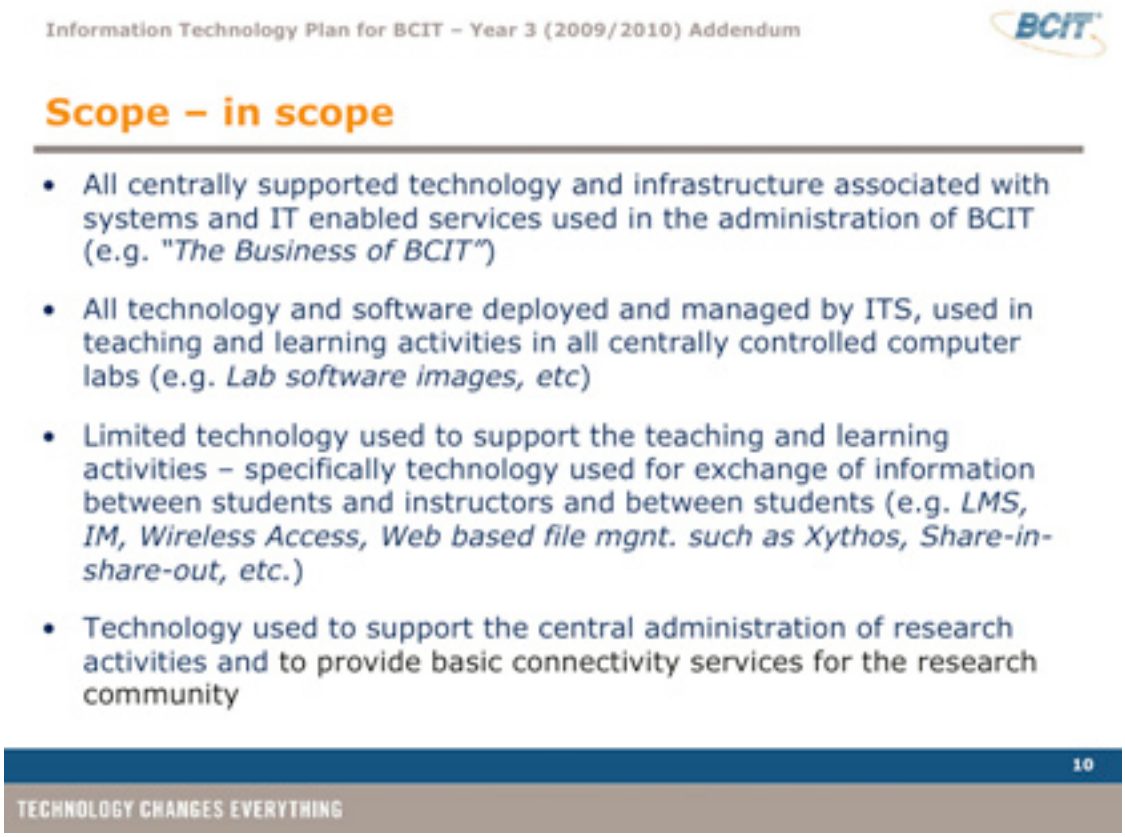
d) consciously remove any identified initiatives or strategies that no longer are relevant due to changes in Institutional priorities



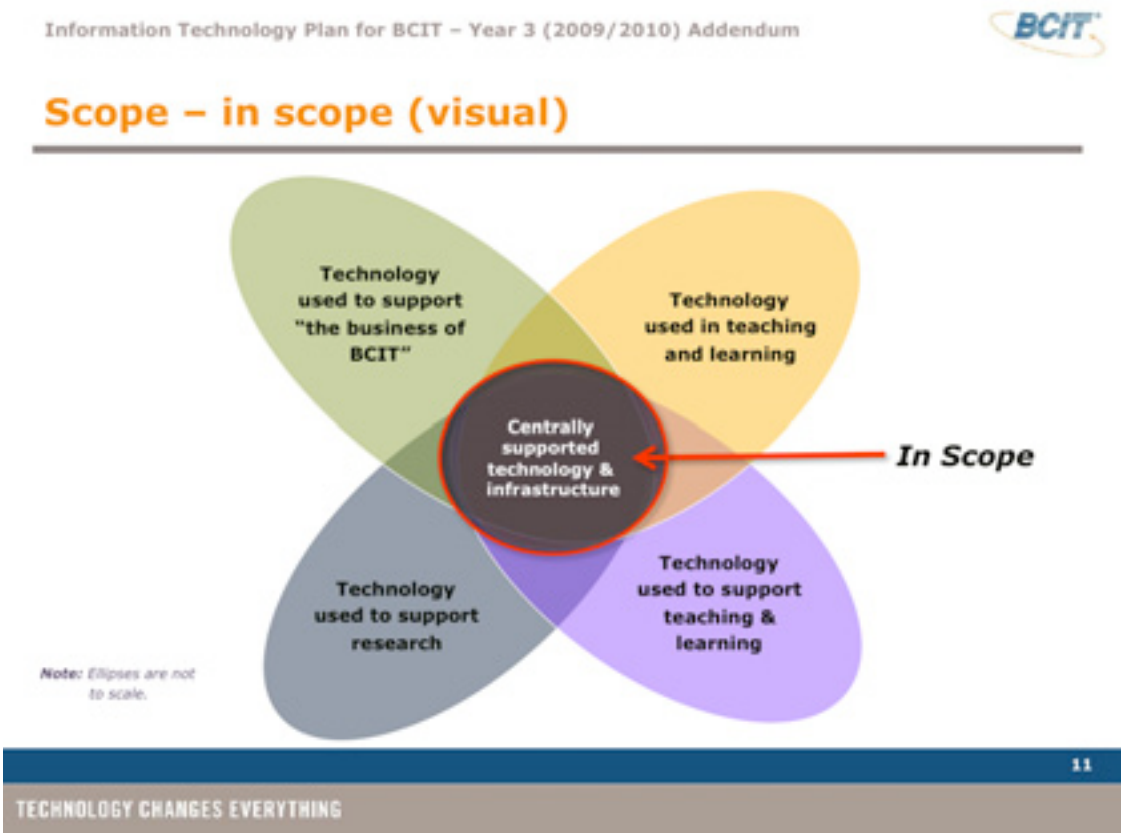
This objective represents the intent for the "interim" years of the Technology Plan. The original plan, produced in 2007 was a "3 Year Plan". The intent in the 'interim' years (year 2 and year 3) is to produce addendums to the original plan, keeping our "As Is" section up to date, review 5 new Environmental Scan areas each year, and update the Road Map activities. In year 4 (2010/2011), the whole plan will be reviewed and updated to create a new starting point for the next 3 years.



As described earlier, the deliverables of this Year3 Addendum are specific, and a subset of the full 3 Year Plan for Technology.

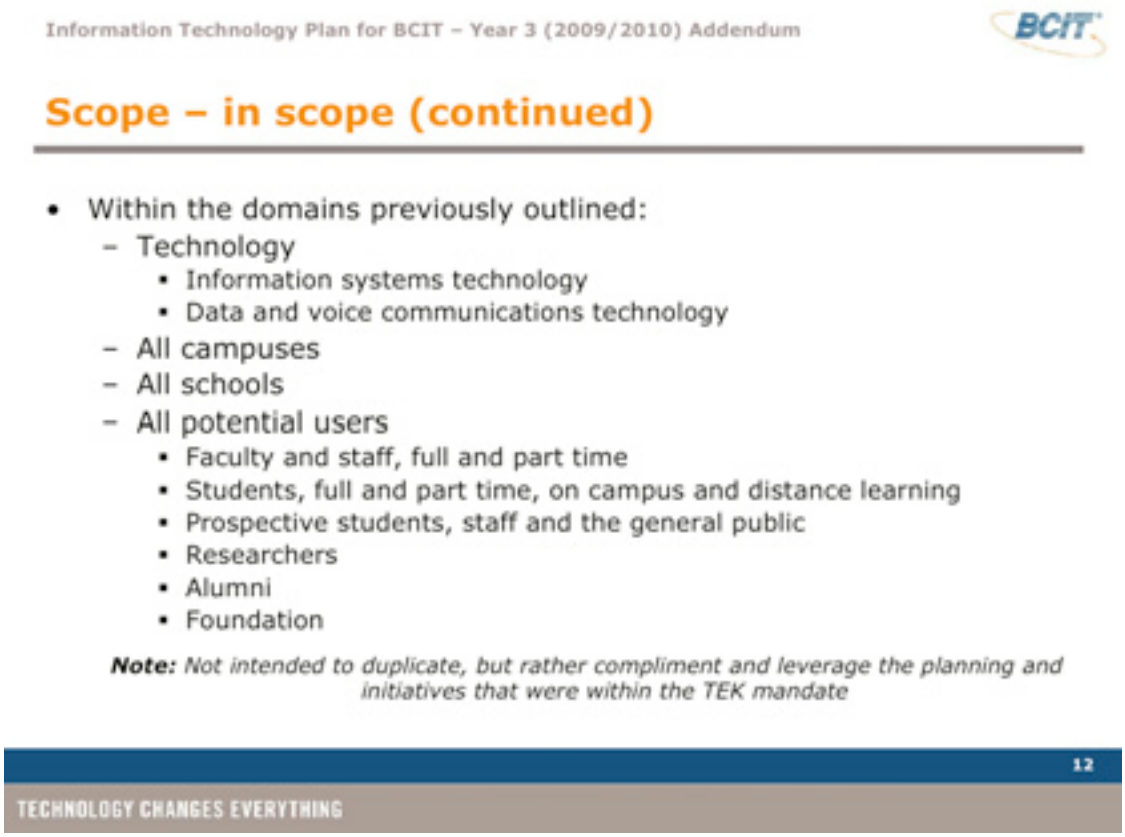


It is important to note that the scope of this plan is meant to be inclusive of all 'centrally supported' technology and infrastructure, whether used for teaching, learning, research, or the administration of the Institute. This would include all hardware, software, networks, and storage, at all campuses, and implemented for all stakeholders and clients, that has been deployed to the benefit of BCIT and that is supported by IT Services.

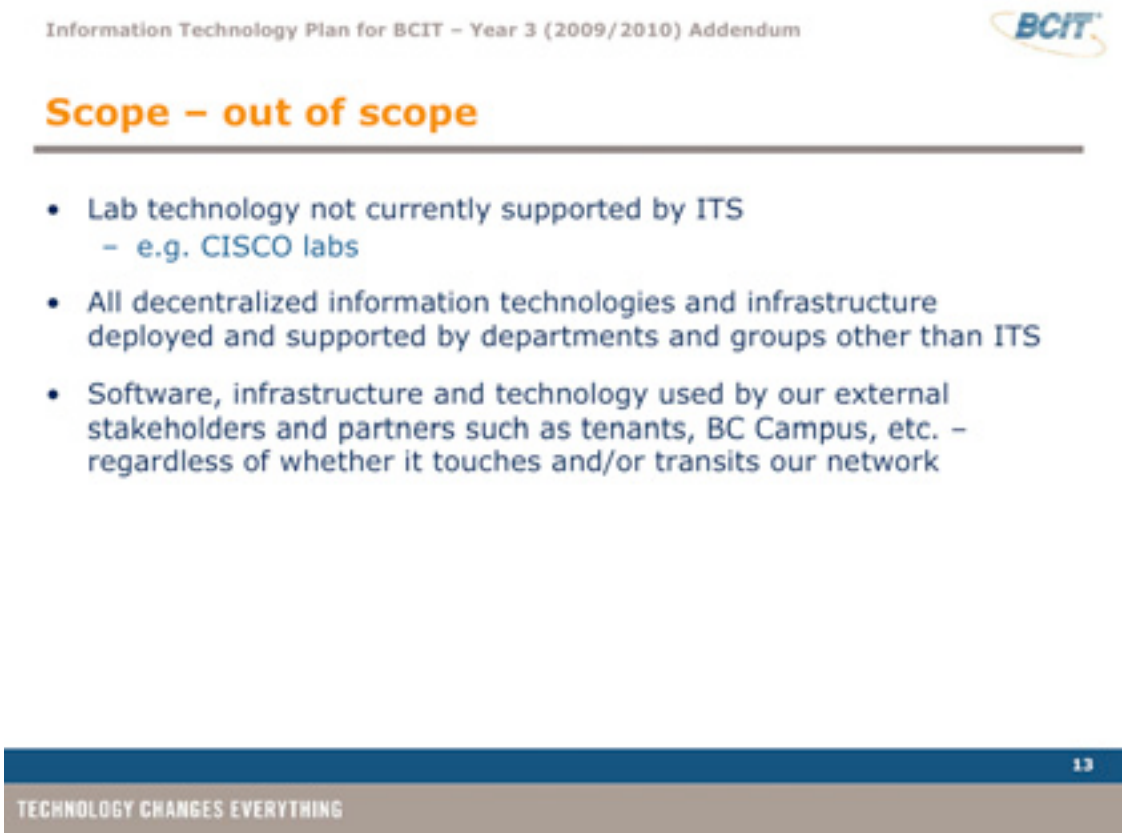


While the diagram above is not intended to be to scale – it does provide a visualization of the areas of technology and infrastructure that are included within thfacebook.com

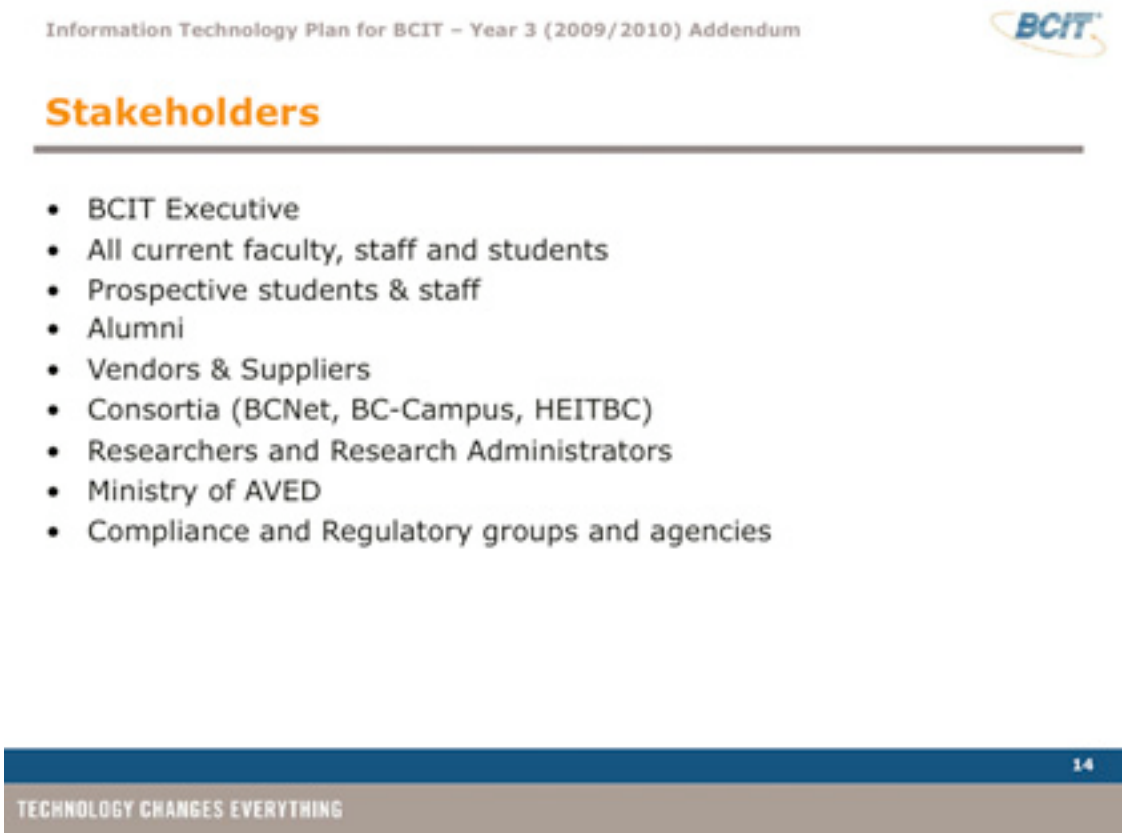
e mandate of this plan, while clearly identifying the core components of each area that are ‘centrally supported’ and therefore “in scope”.



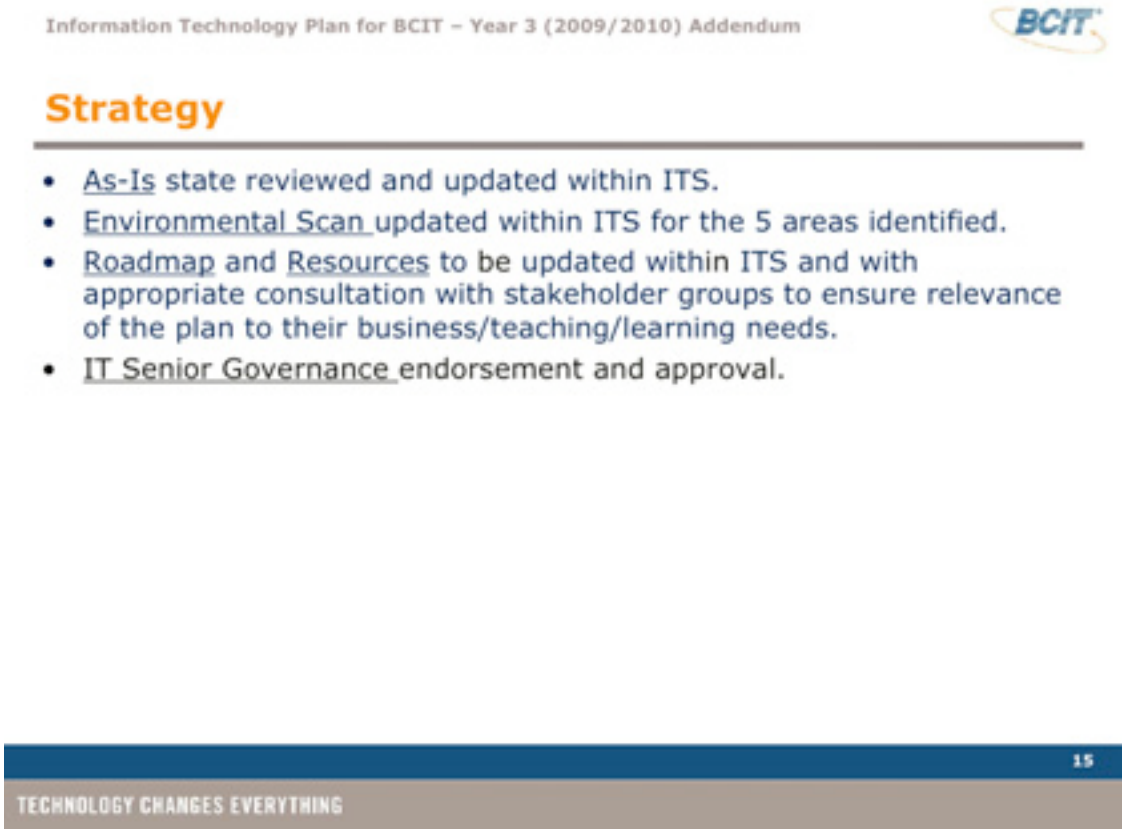
It is important to point out that the 3 Year Plan for Information Technology for BCIT, and theses subsequent addenda, are not meant to compete with other strategic plans and initiatives at the Institute, for example, the TEK initiative and plan. With the emerging Institutional Strategic Plan this year, it will be even more important to ensure that the 3 Year Plan for Information Technology aligns with and supports the overall strategies of the Institute.



There are a few specific areas of technology that are explicitly excluded from the scope of this document and plan. These include areas of information technology that are NOT supported by IT Services. These are typically unique and specific technologies used by teaching areas of the institute within their curriculum, and that do not depend on any support from IT Services. It also includes any information technology implemented on behalf of our tenants and partner organizations, such as BC Campus.



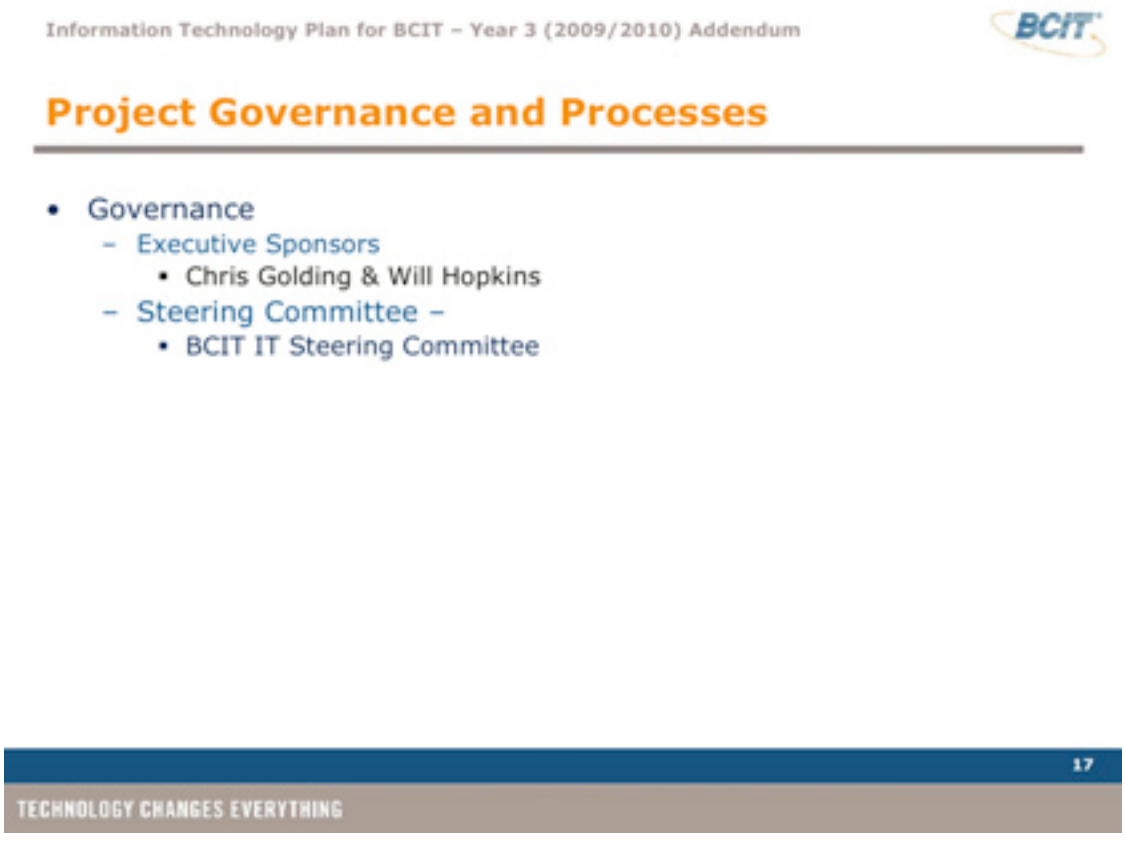
The Stakeholder community is broad, as expected given this document and plan reach into all areas of centrally supported Information Technology. This naturally results in a reach that touches all of the BCIT community members, including potential members (prospective students and staff), as well as past members (Alumni), and all of our trading partners and tenants that we do business with.



As this is an addendum to the original plan, much of the work to create this document is solely within the domain of IT Services.

For the “roadmaps”, IT Services needs to reconfirm with the original stakeholders where activities are still ongoing or planned to ensure that the client still feels these are appropriate to meet their identified needs.

The completion and vetting of the Year 3 Addendum will be dependent on the input of a number of IT Services staff and managers who all bring valuable Subject Matter Expertise to the exercise. As of this current addendum (June 2009), the new BCIT IT Steering Committee will act as the Steering Committee for this exercise, and will be responsible for accepting the deliverables of this initiative.



The original project was condoned and sponsored by the BCIT Sr. Executive Team. Over time, the need for a more focused IT Governance body and process has been articulated, and as of the Spring of 2009, there has been an endorsement of the new BCIT IT Steering Committee. This committee is made up of:

- Director ITS
- VP LTS
- VP Ed
- VP Finance and Admin
- VP Student Services
- VP Research
- VP HR

The following section is a representation of the current (as is) state of the Information Technology environment at BCIT that is centrally supported by IT Services. This section has been reviewed and updated for this Year 3 Addendum.

Table of Contents – Section 2 "Revised As-Is"

The Introduction positions the As Is State within the context of the overall IT Planning process and introduces concepts and terms that will be used later in the presentation.

The Executive Highlights section provides general background and draws attention to items in the As Is state from which conclusion may be drawn about future risks and opportunities.

The **Business Management of Information Technology** documents the maturity of current IT processes, the state of IT governance and key disciplines such as service management, project management, security, business continuity.

People and Financial Resources considers the staff and budget devoted to IT. For the first version of the plan almost exclusive attention is given to centralized IT resources as captured in the budget and staffing of the **Information Technology Services** Department.

The **Applications** section profiles the application portfolio and speaks to the currency of major applications and the redundancy in some application areas such as collaboration.

Middleware likewise profiles the currency of key web, application and database management software.

The **Infrastructure** section deals with end devices such as desktops, laptops and mobile devices together with networks, servers and storage.

The **Physical Facilities** section deals with Machine room space, wiring closets, and office space.

2.1) Introduction

- 2.1.1 - Plan Framework
- 2.1.2 - Rationale

Intentionally left blank.

2.1.1 - Plan Framework

Environmental Scan

Broad, higher educational and technology trends that can inform the development of our plans

Strategic Planning Assumptions

Statements of our future such as growth rates, locations, services that the plan must support

Vision

Timeless statements of our aspirations

To Be State

How the vision will manifest itself at the end of the planning horizon

The As Is State

A qualitative and quantitative description of the current environment

Gap

The difference between the As Is and To Be State

Roadmap

The series of initiatives with measurable outcomes that will bridge the gap

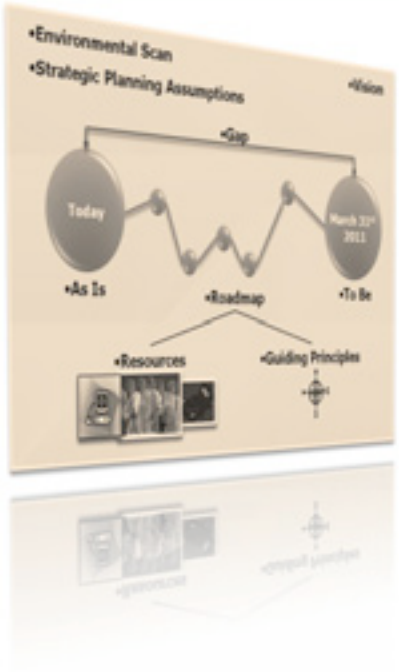
Resources

What is required in terms of funding, staffing and other resources required to carry out the roadmap

Guiding principles

The set of design principles used to build the roadmap and to be used when adjusting the roadmap to unplanned events

2.1.2 - Rationale



- Why document the As Is state?
  - Input to gap analysis
  - Common basis of information for the planning team
  - Establish baseline metrics
  - Useful for benchmarking
  - Foundation for future iterations of the Plan

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TECHNOLOGY CHANGES EVERYTHING

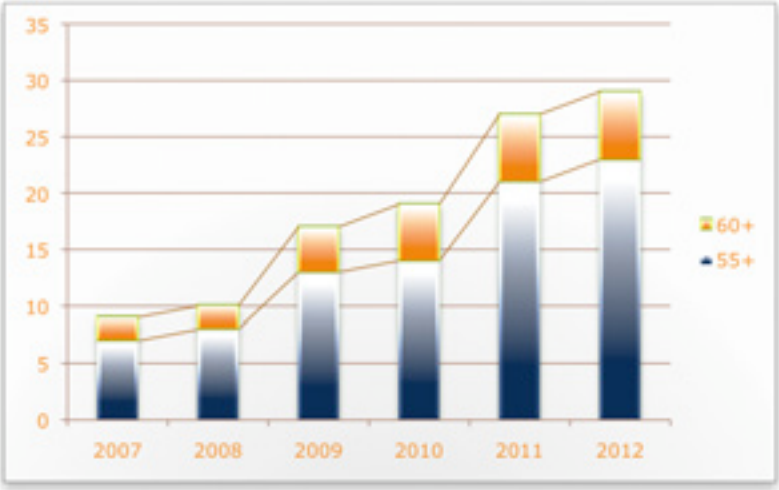
Preparing and reviewing and reconfirming the "As Is" State is also a good test of the availability of information about IT assets and configurable items. The work to date will result in improvements to asset and configuration management. It also provides a cross reference and a basis for the IT Enterprise Architecture artefacts.

2.2) Revised "As Is" Executive Highlights

- 2.2.1 - HR & Financial Resources
- 2.2.2 - Governance
- 2.2.3 - Maturity Models & Control Frameworks
- 2.2.4 - I.T. Security
- 2.2.5 - IT Continuity
- 2.2.6 - Organizational Change Management
- 2.2.7 - Software Applications
- 2.2.8 - Age & Profile of Infrastructure

The intent of the Executive Highlights section is to draw attention to those areas of the "As Is" state that likely represent significant opportunity or risk to be further considered in the plan. This section represents the basis of the core presentation to the Steering Committee upon completion of the Year 3 Addendum.

2.2.1) HR & Financial Resources – Retirement Eligibility

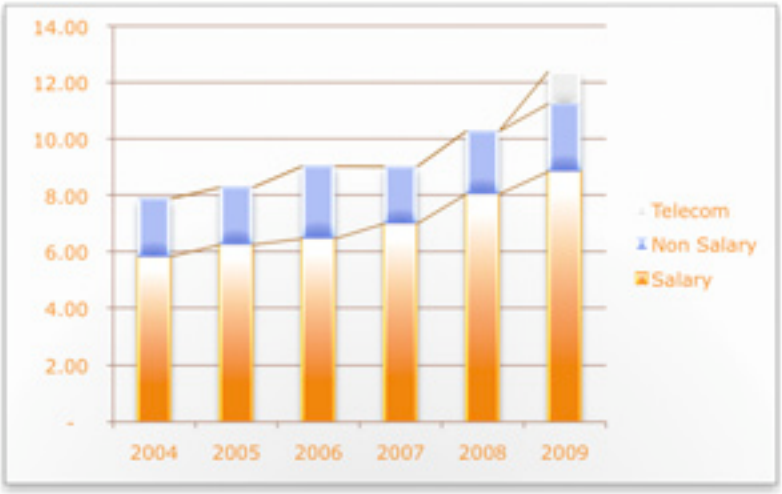


- Cumulative numbers of employees over 55 and 60
- Note these are calendar years
- 4 out of 7 managers will be 55 by 2010
- There are 16 staff members that will be 55 or older by 2012 that already have 15 or more years of service and experience at BCIT *(as of March 2009)*
- Current complement represents 1,061 years of service to BCIT *(as of March 2009)*.
- Staff that will be 55 or older by 2012 currently represent 395 years of experience and service to BCIT. *(as of March 2009)*.

The aging workforce is evident in the IT Services complement of staff. By 2012, there will be 23 individuals within IT Services that are age 55 or older. Of those in that category, 16 of them already have 15 years of service or more.

As these individuals decide to retire, there will be a significant loss of tacit knowledge and experience. Harvesting that knowledge and experience should be an activity of an Institute wide succession management campaign and program.

2.2.1) HR & Financial Resources – ITS Opex



- Operating Expenditures CAGR from 2004 to 2009 is 9.65% with Telecom added
- Telecom transferred to IT Services in 2009 – represents a non-salary increase of approximately $1.152M and a salary increase of approximately $105K.
- Labour costs per headcount have risen at a CAGR or 4.5% over the same period due to salary scale increases, increment progression, reclassifications, addition of 2 positions to support telecomm, and changes in workforce composition

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TECHNOLOGY CHANGES EVERYTHING

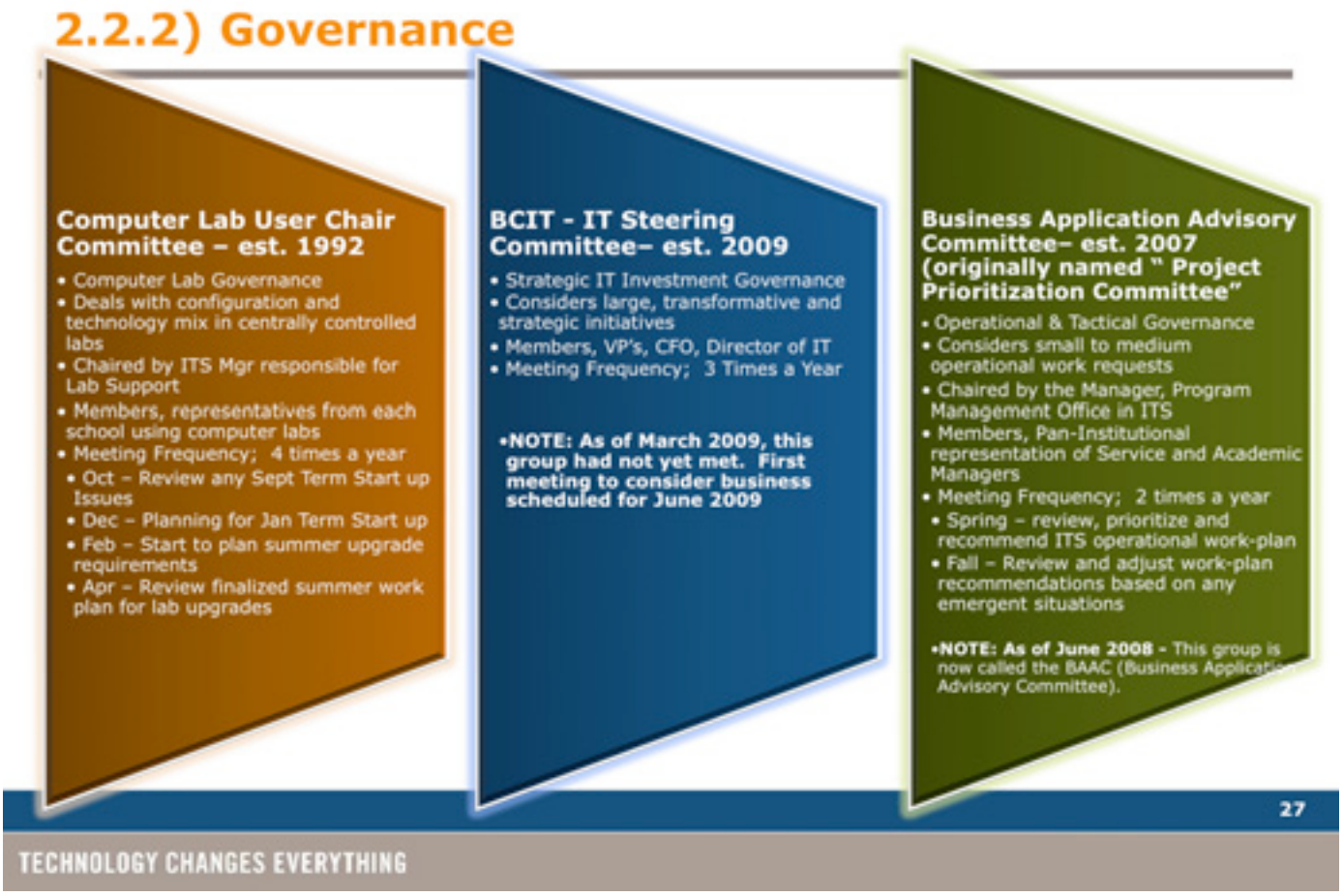
While the slope of the trend line on the bar graph above makes a significant vertical shift for the 2009 fiscal year, a significant portion of that can be attributed to the patriation of Telecomm to IT Services. The transfer of Telecom resulted in an increase to IT Services total budget of approximately $1.25Million .

The change in the “salary” component of the bar chart can be attributed to staged increases to headcount that were initially approved in 2007/2008. There were 5 positions approved that year, though IT Services was able to run without filling all of them immediately. They were filled and therefore expensed across the last 2 fiscal years.

2.2.1) Growth Comparisons – Resources vs. Outputs

GROWTH		
Area	From to 2008	CAGR
Headcount	2004	5%
Operating Expenditures	2004	7%
End Devices	2004	11%
Computer Labs (fully supported)	2004	7%
Network Devices	2004	42%
Operating Systems Instances (Servers)	2005	21%
Storage	2005	54%
Web Pages	2003	17%
Web Traffic	2002	93%
Web Publishing Activity	2004	545%

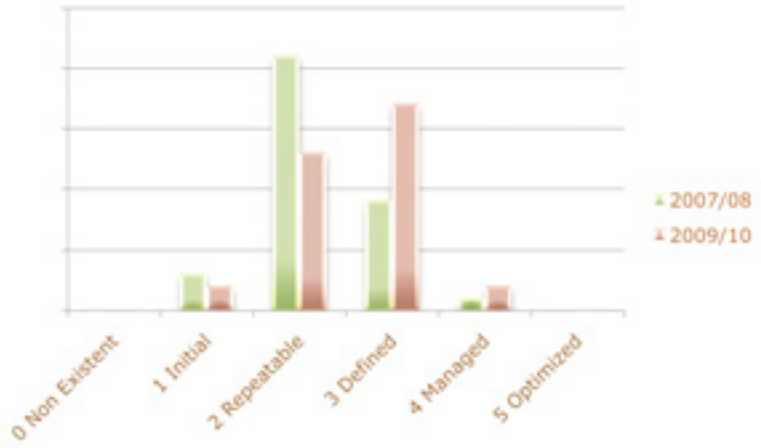
The relative growth of services and IT infrastructure supported by IT Services far outstrips the rate of growth of the headcount and operating budget/expenditures of IT Services over the same period of time.



There are three governance bodies at BCIT focused at different levels of IT investment and decision making:

1) **The Computer Lab User Chair Committee** is the most mature and well established, with well known objectives and process.
2) **The BCIT - IT Steering Committee** is a new construct raised by the Director of IT Services and discussed and approved by the President and VP LTS. Its first meeting is scheduled for June 2009, at which time they will consider this report – the Year 3 Addendum to the 3 Year Plan for Technology for BCIT.
3) **The Business Application Advisory Committee**, originally named the "Project Prioritization Committee" is in its second year of operation. This group is made up of individuals from across the various business areas of the Institute that have are stakeholders in setting the annual workplan of IT Services. This group meets 2 to 3 times a year where as a group, and based on established criteria, rank the various requests for IT Services application support. This is provided to IT Services as input to a complete planning process that establishes IT Services overall operational plan.

2.2.3) IT Process Maturity – 34 CobiT Processes



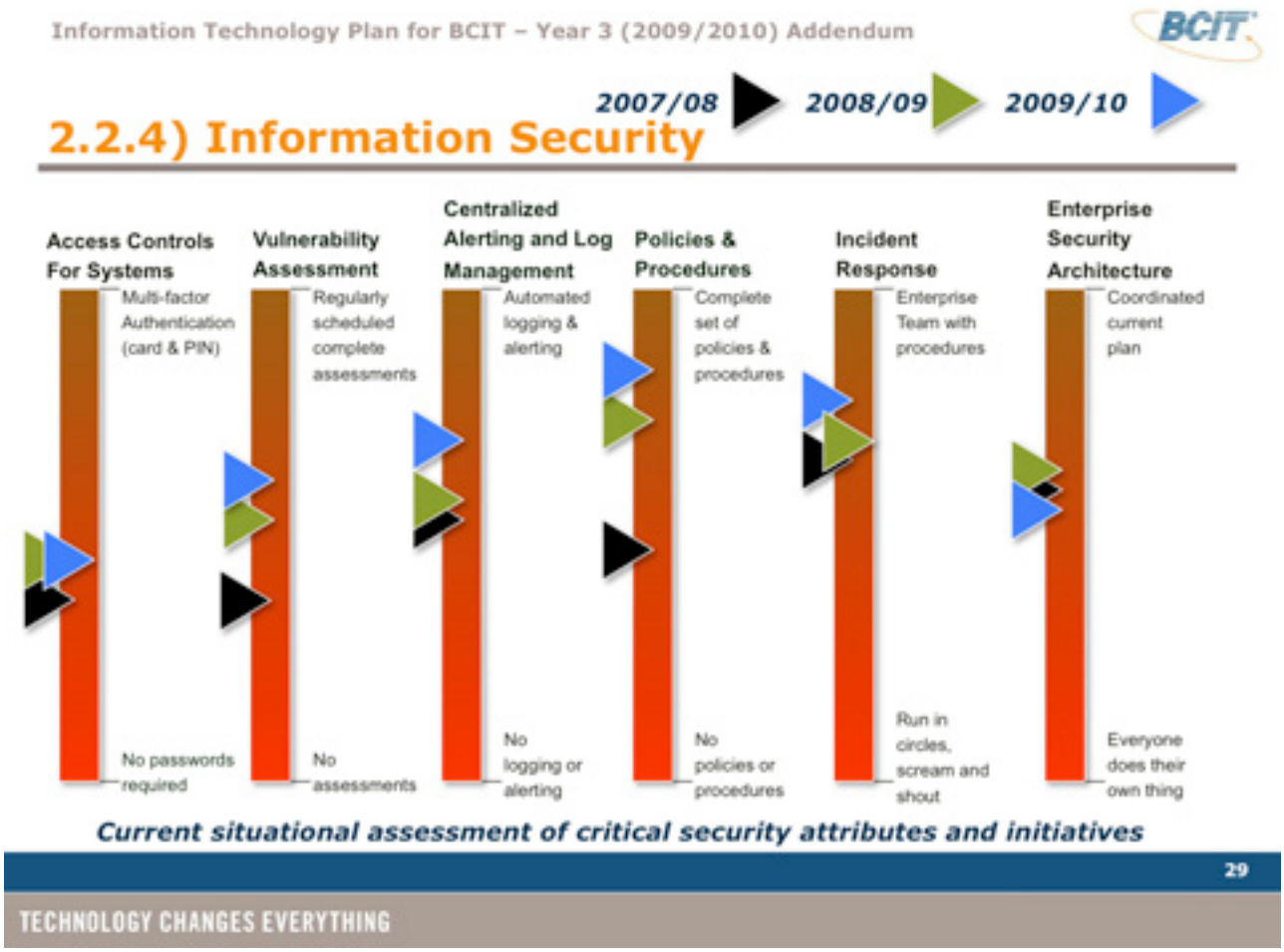
- Processes exist for two main purposes
  - Compliance
  - Results
- CobiT, ITIL and PMBOK were used as frameworks for assessing process maturity
- A Delphi process using the ITS leadership team rated the 34 specific CobiT processes in 07/08 and again in 09/10 as shown in the chart
- Significant progress has been perceived in moving processes up the maturity scale over those 2 years

Typically, Control Framework process improvements are usually implemented for two reasons. Compliance to legislation or regulation may require the implementation or improvement of processes and associated controls or the improvement may be designed to produce a specific result. Process programs that establish process for process sake without focusing on results are usually abandon with a high level of organizational frustration.

CobiT defines 34 higher level processes for the management of Information Technology and provides detailed criteria for the maturity of each process. Descriptions of these processes and associated maturity criteria were circulated to the ITS Leadership team in 2007 as part of the initial Technology Plan. Each member was asked to rate the maturity of each process. This was repeated in March of 2009. An average score was calculated and the largest integer value less than the average was taken as the maturity level. The above histogram displays the resulting scores, and indicates the progress up the maturity scale as perceived by the ITS Leadership team over the 2 years.

Initially (2007 data) the majority of processes where rated as repeatable. This means that the IT organization, if not the entire organization has at least recognized the management issues. Also at this level processes have developed to the stage where similar procedures are followed by different people undertaking the same task. There is no formal training or communication of standard procedures, and responsibility is left to the individual. There is a high degree of reliance on the knowledge of individuals and, therefore, errors are likely. By 2009, the balance had shifted to the majority of the processes being perceived as “defined”.

Many of the processes that received a rating of 3 or 4 result from the efforts to implement ITIL. Specific objectives were set for these process improvements such as increased customer satisfaction, fewer failed change requests, and improved availability.



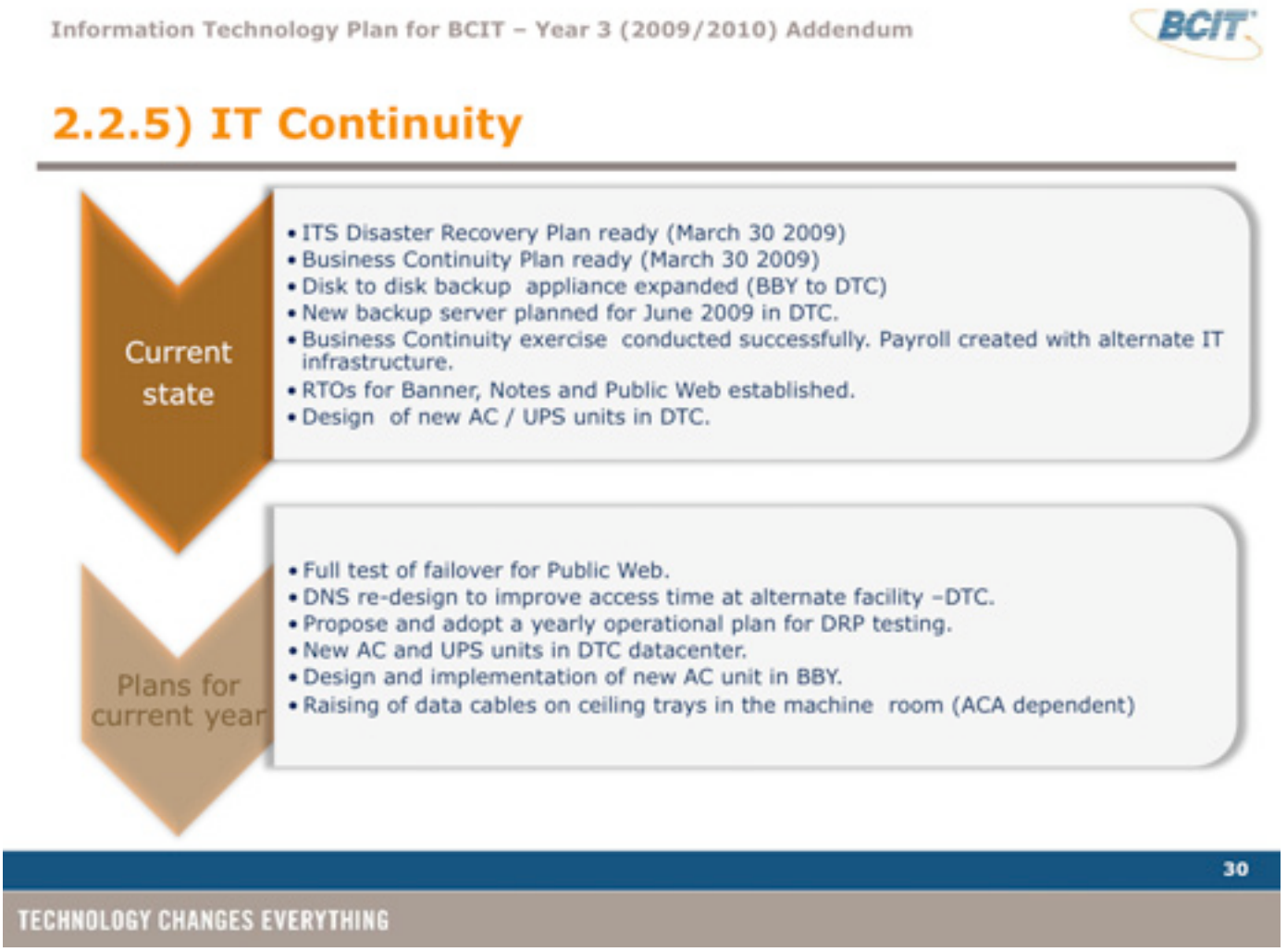
As with most organizations, whether public sector or private sector, ITS has a responsibility to ensure that the data and infrastructure used in the operation and management of BCIT is safeguarded against fraudulent use and malicious attacks. Failure to properly attend to IT Security can expose the Institute to the following risks:

- loss or corruption of data
- compromised or disabled infrastructure and equipment
- identity theft
- significant disruption of business and educational activities
- potential litigation
- loss of trust and credibility with our stakeholders

The information above attempts to position BCIT's current progress in 6 specific areas of IT Security activities and initiatives that are aimed at managing the associated risks to the Institute. These 6 activities and initiatives are representative of BCIT's due diligence to secure and safeguard its IT assets and data.

Over the 2008/2009 year, specific progress has been made in the revision and review of the BCIT "Acceptable Use of Information Technology" Policy (Policy 3501) and the development and introduction of a Data Security and Classification Policy (Policy 3502). The Data Security Policy (Policy 3502) has been approved by the Board and assigned to the Audit Committee to determine how best to implement a reporting mechanism to inform that Board of any issues or risks.

The measureable slippage in 2009/2010 in the "Enterprise Security Architecture" is a reflection of a couple of things. Firstly, there are many more changes than usual happening at the enterprise network level related to projects to migrate from Novell to Microsoft, extensions to networks to reach tenants and the CARI facility, and some renewal of edge switch devices. These changes and their related complexities introduce some new challenges that need some attention. Better integration of the IT Security Office in the design of these changes will mitigate these issues going forward. Secondly, a rather comprehensive penetration assessment was performed in the 2008/2009 year which exposed more vulnerabilities than were known prior to the assessment. These vulnerabilities have now been been enumerated and documented, and plans to address them are being developed.



Our backup data centre (DTC) has now entered the operational stream. A deficiency was identified in the lack of proper AC and power quality, and plans are underway to remedy this condition. A new UPS and a new, 3-ton AC unit is being procured and installed. Target date is May 2009.

Also, last year we conducted a successful 'Business Continuity' exercise with the Finance department. Their payroll was created using our backup infrastructure downtown, and processes were tested as well.

A rally point project 'Business Continuity - Year 2' has completed some of the intended deliverables, while others will be finished before the end of March 09 (DRP plan in particular), and a few have been postponed: the fail-over test, which will demonstrate a network failover (again), and seamless Web failover.

There are no plans to add more BC functionality at DTC, other than to enrich what's already there: more Web presence, and add capacity to their disk-to-disk complex (BBY to DTC).

The Business Continuity Plan is being intricately linked with ITS Disaster Recovery Plan.

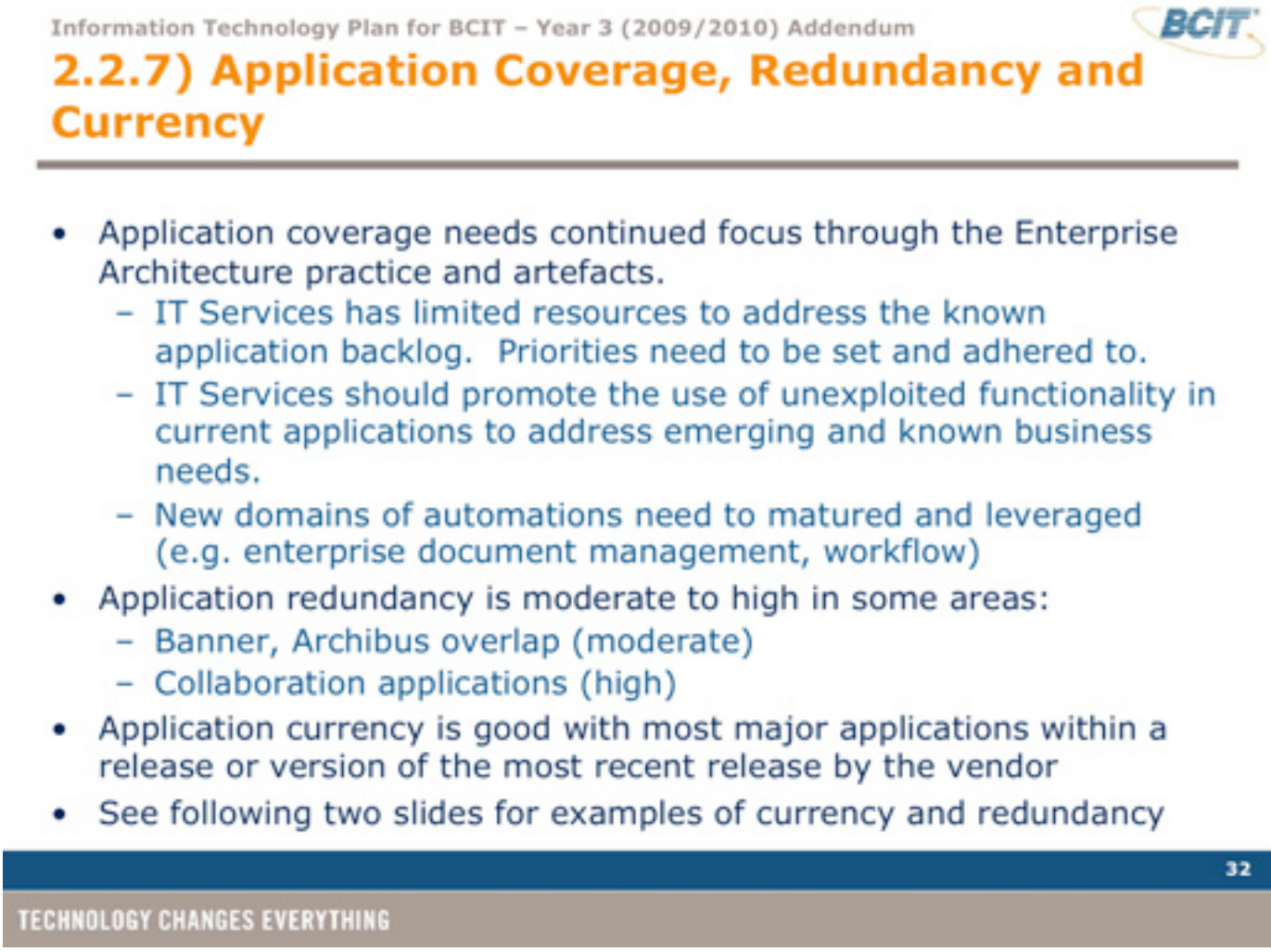
2.2.6) Organizational Change Management

- Organizational change management is the discipline of planning for and responding to changes that impact people, processes and the organization with the goal of minimizing the negative effects of the change and accentuating the positive
- While ITS has made significant progress on processes around technology change management, ITS has not established any formal organizational change management practices
- ITS has established an internal "Employee Survey Response Team" (ESRT). This group has been constituted to provide a venue for ITS Staff input and feedback to departmental processes and decisions.

Many IT initiatives and other projects fail because people and processes are not properly considered. Lack of a disciplined organizational change management approach is often sited as one of the top ten causes of project failure.

This is an area that is being considered for focused attention within the Strategic Practices group of IT Services. Following the same process as other disciplines and practices that have started in Strategic Practices, the discipline of Organizational Change Management will emerge as a separate practice accompanied by a Capability Maturity Model to lay out a roadmap for the fostering, development and maturation of these activities until they are fully assimilated into the culture and practice of IT Services.

2009/2010 will be the beginning of the formal activities to structure a discipline around Organizational Change Management. IT Services will look to leverage existing expertise and skills resident in areas of BCIT such as Organization and People Development.



The software "Application Portfolio" that IT Services has responsibility for has evolved over time. There have been identifiable 'phases' of different approaches to supplementing the portfolio to meet business needs. For example, with the adoption of an Enterprise Resource Planning (ERP) system for our core business activities (Student Records Management, Finance, Human Resources) there have been a number of extensions of business function capability that has been delivered by the software vendor (Sungard Higher Education – "Banner") that have been implemented with native integration to our core business applications. These include features such as the myBCIT Portal, Student and Faculty Web Self Service, and Document Management.

In other cases, adjunct applications have been added to the portfolio. With the tendency for software vendors to try to put as much potential functionality into their product offerings in order to differentiate themselves and create a better value-proposition perception, it has been inevitable that over time, duplicate functionality has arisen across implemented software. The challenge that IT Services faces is their ability to support more, and even divergent technologies with a limited technical manpower resource pool. Each new technology that is added to the supported environment requires the attention of skilled IT professionals, and to some extent, further dilutes ITS's support capabilities across heterogeneous tools and environments. A concerted effort needs continue to identify overlaps in functionality and find ways to exercise convergence without compromising the business and academic unit's needs.

2.2.7) Application Currency – Sungard HE Example

ERP Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Banner Finance	1996	Aug 2008	7.4	Aug 2010	8.3	8.1
Banner General	1992	Aug 2008	7.5.1	Aug 2010	8.3	8.1
Banner HR/Payroll	1999	Aug 2008	7.2.6	Aug 2010	8.3	8.1
Banner Position Ctl	1999	Aug 2008	7.3	Aug 2010	8.3	8.1
Banner Student	1992	Aug 2008	7.4	Aug 2010	8.3	8.1
Banner Student A/R	1992	Aug 2008	7.3	Aug 2010	8.3	8.1
Web for Employee	2006	Aug 2008	7.3.6	Aug 2010	8.3	8.1
Web for Faculty	2006	Aug 2008	7.4	Aug 2010	8.3	8.1
Web for Student	2006	Aug 2008	7.4	Aug 2010	8.3	8.1
Document Mgmt	2008	Sep 2008	7.4	Aug 2010	8.3	8.1

IT Services has a practice of ensuring that our primary and mission critical systems remain current in order to ensure that we are able to leverage all new features and functions, as well as to ensure that we remain in a 'support model' from the vendors of the systems. Many software vendors have moved to a practice of supporting their most current release and one release back. This is deemed necessary by the vendors to ensure that they are not diluting their skill, talent and productivity pools supporting back versions that are poorly subscribed. For BCIT, this means a significant amount of effort on the part of both the IT Services teams, as well as the functional/end-user departments is consumed installing, testing and implementing newer versions of our systems.

2.x.x) Application Currency

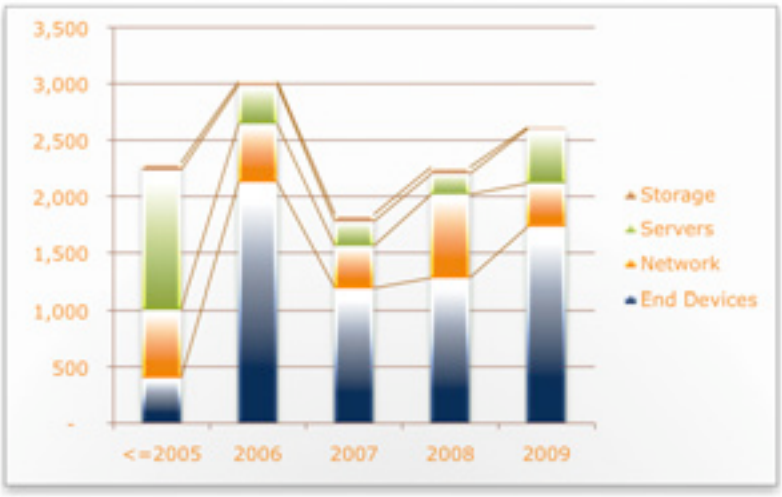
ERP Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Banner	1996	Aug 2008	7.4	Aug 2010	8.3	8.1
Lotus Notes	1996	Dec 2008	8.5	unknown	unknown	8.5
Oracle	2001	2007	10.1.2	2011	11	10.1.3
Cognos	2000	2008	7.3.14	July 2009	7.4.3	7.4.3
Desire 2 Learn	2008	2009	8.3	July 2009	8.4	8.4

IT Services has a practice of ensuring that our primary and mission critical systems remain current in order to ensure that we are able to leverage all new features and functions, as well as to ensure that we remain in a 'support model' from the vendors of the systems. Many software vendors have moved to a practice of supporting their most current release and one release back. This is deemed necessary by the vendors to ensure that they are not diluting their skill, talent and productivity pools supporting back versions that are poorly subscribed. For BCIT, this means a significant amount of effort on the part of both the IT Services teams, as well as the functional/end-user departments is consumed installing, testing and implementing newer versions of our systems.

2.2.7) Feature/Function Redundancy - Collaboration Tools Example

IT Services often supports a number of tools in each area of delivery of services. For example, with respect to Collaboration services, IT Services currently supports at least 10 different systems that deliver one or more collaboration features. This situation has evolved for a number of reasons. With the adoption of an Enterprise Architecture (EA) discipline, and the proclamation of an EA principle to 'reduce complexity of our IT environment' where ever possible, we have started to look at feature comparisons such as the one above, with a view to systematically, after careful analysis, reduce the number of supported environments in order to reduce redundancy and thereby simplify the environments that need to be supported by IT Services without negatively impacting our stakeholders.

2.2.8) Age and Profile of Infrastructure



- The chart shows the estimated replacement cost (in '000's') of equipment by year of installation
- The first bar represents equipment installed in 2005 or earlier
- A total of $9.5M of equipment is represented by the chart – note physical facilities such as machine room space, power supplies and cabling plant are not included
- Approximately $2M of network and server equipment was installed in 2005 or before
- Much of the increase in 2008 is due to ATC equipment installations
- Much of the increase in 2009 is due to NOS and Citrix projects

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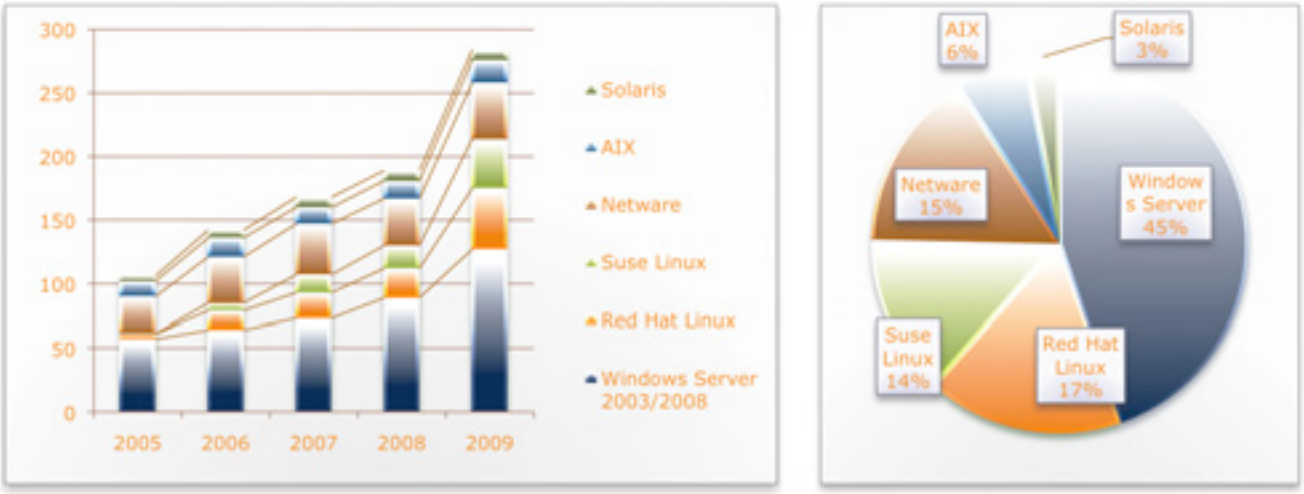
The estimated replacement cost for all of the active, centrally supported IT infrastructure is approximately $12Million. IT Services has been focused on identifying equipment and infrastructure that is reaching, or has surpassed its expected useful life, and requests Capital for replacement of this equipment annually. The useful life of different components of infrastructure varies from 3 to 4 years (computers, network switches, etc) to as much as 10 years (fibre optic and network cabling, etc). Failure to replace and renew IT infrastructure can put the Institute's IT assets at serious risk of failure and/or loss. Additionally, renewing on regular basis allows the Institute to take advantage of constantly improving price/performance curves.

As of 2009, the following Capital requests have been identified as required to adequately renew infrastructure over the coming 5 years:

- 2010 : $4,394,000
- 2011 : $4,574,000
- 2012 : $3,352,000
- 2013 : $2,642,000
- 2014 : $3,140,000

5 Year Total: $18,085,000

2.2.8) Operating System Instances



- The graph shows the number of instances of various operating systems (OS) by year
- Windows Server represents 45% of instances versus 15% for Netware
- While AIX instances represent a small proportion of instances, BCIT's most mission critical systems run on this OS
- The two variants of Linux have grown at a CAGR of 40% since 2006

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TECHNOLOGY CHANGES EVERYTHING

The graphic above describes an increasing trend line in the overall number of "operating system" instances over the past 5 years. These could 'roughly' be equated to the increase in the number of servers IT Services has implemented and supports. More recently (2008/2009), IT Services has started to deploy virtual servers in earnest. The result is that the number of physical server devices within IT Services is lower than the number of "operating system instances".

2.3) Details of the "As Is" State

2.3.1) The Business Management of IT

- 2.3.1.1 - Process Maturity
- 2.3.1.2 - Governance
- 2.3.1.3 - Service Management
- 2.3.1.4 - Information Security
- 2.3.1.5 - IT Continuity
- 2.3.1.6 - Business Analysis and Solutioning
- 2.3.1.7 - Project Management
- 2.3.1.8 - Org Change Management
- 2.3.1.9 - Partnerships and Collaboration
- 2.3.1.10 - Sourcing Strategies

The following section speaks to the overall management of IT from a 'business of IT' perspective.

2.3.1.1) Process Maturity – CobiT Framework -

Plan and Organize

Process	2007 Delphi	2009 Delphi
PO1 Define a Strategic IT Plan	1.25	3.60
PO2 Define the Information Architecture	1.38	2.20
PO3 Determine Technological Direction	2.25	3.00
PO4 Define the IT Processes, Organisation and Relationships	2.25	2.40
PO5 Manage the IT Investment	2.25	3.00
PO6 Communicate Management Aims and Direction	2.25	2.20
PO7 Manage IT Human Resources	2.00	2.40
PO8 Manage Quality	2.13	1.80
PO9 Assess and Manage IT Risks	1.50	2.80
PO10 Manage Projects	2.88	3.00

Acquire and Implement

Process	2007 Delphi	2009 Delphi
AI1 Identify Automated Solutions	2.25	3.00
AI2 Acquire and Maintain Application Software	2.75	3.40
AI3 Acquire and Maintain Technology Infrastructure	2.75	2.80
AI4 Enable Operation and Use	2.13	3.00
AI5 Procure IT Resources	2.50	3.40
AI6 Manage Changes	3.38	3.00
AI7 Install and Accredit Solutions and Changes	2.25	3.20

- The assessments of CobiT process maturity on this and the following slide represent the average ratings of the ITS Leadership Team

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TECHNOLOGY CHANGES EVERYTHING

In 2007/2008, IT Services did a self assessment of the department's maturity levels against the 34 standard CobiT Processes. While this assessment was performed by, and aggregated between the IT Services Leadership Team, it does reflect a fairly accurate assessment of our collective thinking at that time with respect to each process. The maturity rankings go from a measure of "0" with means there is no evidence of the process at all, to "5" which indicates that the process has been fully implemented and optimized. The detailed values are presented on this and the following page.

In March 2009, the assessment was repeated by the ITS Leadership Team. The new values are displayed above, along side the previous values. This too indicates a fairly accurate, albeit anecdotal assessment of our maturity level on each of the 34 processes. While individually, the changes range from increases in maturity of 2.35 points (process P01), to reduction in maturity of 0.70 points (process DS2), overall, the trend across all 34 processes shows a definite shift to a more mature, process driven organization. See page 28 for a comparison of the trends across the 5 levels of maturity.

2.3.1.1) Process Maturity – COBIT Framework

Monitor and Evaluate		
Process	2007 Delphi	2009 Delphi
ME1 Monitor and Evaluate IT Performance	1.75	1.20
ME2 Monitor and Evaluate Internal Control	1.50	1.40
ME3 Ensure Regulatory Compliance	2.25	2.80
ME4 Provide IT Governance	2.13	2.00

Deliver and Support		
Process	2007 Delphi	2009 Delphi
DS1 Define and Manage Service Levels	3.13	3.00
DS2 Manage Third-party Services	2.50	1.80
DS3 Manage Performance and Capacity	2.13	2.00
DS4 Ensure Continuous Service	2.50	3.40
DS5 Ensure Systems Security	2.63	2.60
DS6 Identify and allocate costs	1.63	2.20
DS7 Educate and Train Users	2.63	2.20
DS8 Manage Service Desk and Incidents	3.75	3.80
DS9 Manage the Configuration	2.13	1.80
DS10 Manage Problems	2.25	2.00
DS11 Manage Data	2.63	2.20
DS12 Manage the Physical Environment	3.00	3.20
DS13 Manage Operations	3.13	2.60

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TECHNOLOGY CHANGES EVERYTHING

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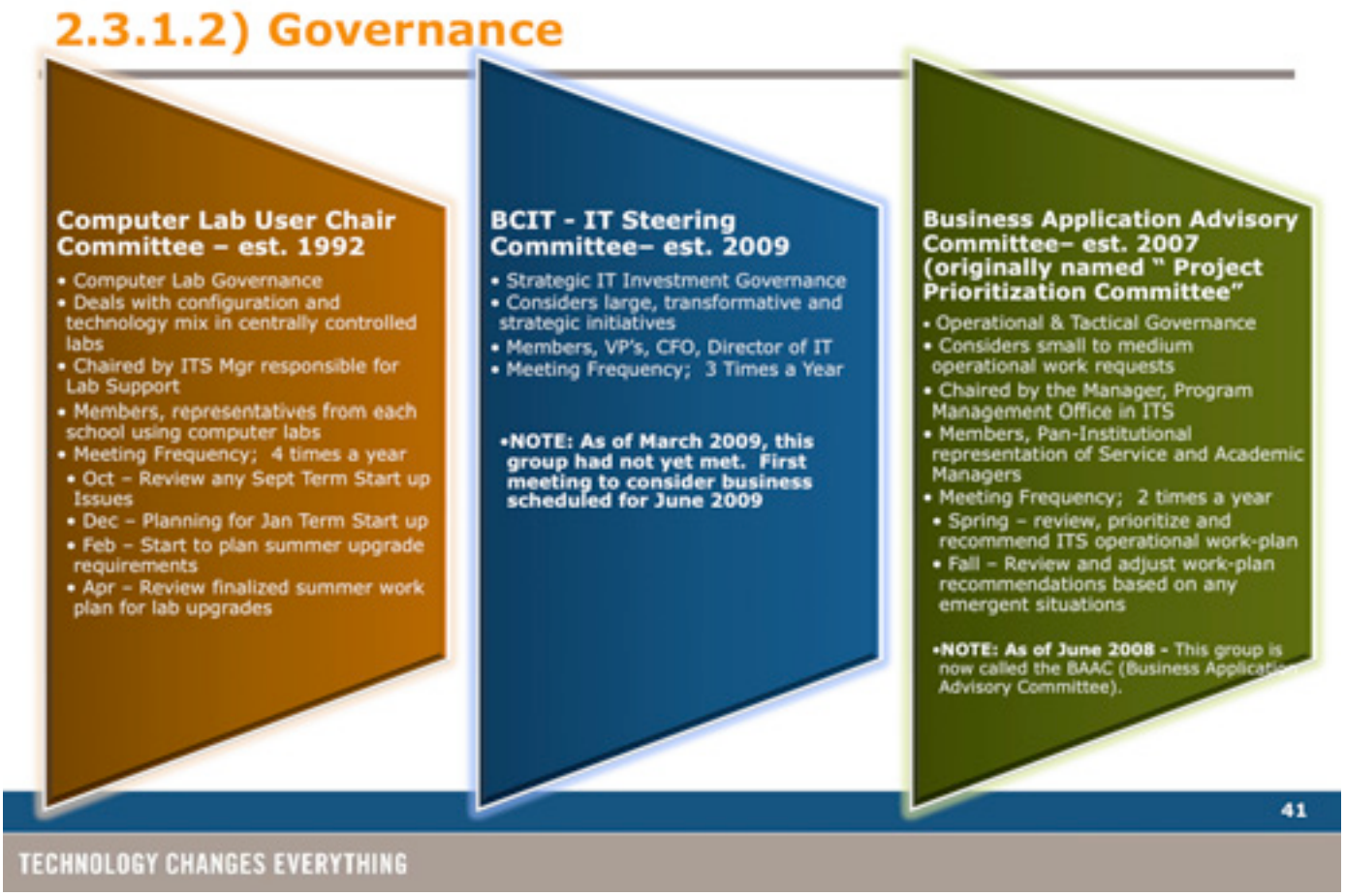
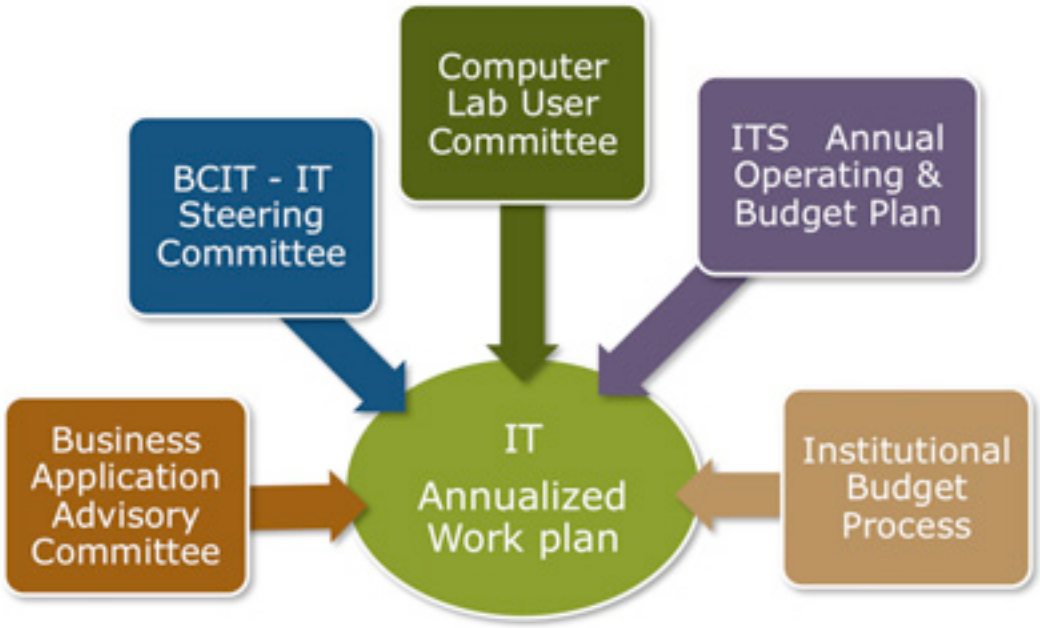


There are three governance bodies at BCIT focused at different levels of IT investment and decision making:

1) **The Computer Lab User Chair Committee** is the most mature and well established, with well known objectives and process.
2) **The BCIT - IT Steering Committee** is a new construct raised by the Director of IT Services and discussed and approved by the President and VP LTS. Its first meeting is scheduled for June 2009, at which time they will consider this report – the Year 3 Addendum to the 3 Year Plan for Technology for BCIT.
3) **The Business Application Advisory Committee**, originally named the "Project Prioritization Committee" is in its second year of operation. This group is made up of individuals from across the various business areas of the Institute that have are stakeholders in setting the annual workplan of IT Services. This group meets 2 to 3 times a year where as a group, and based on established criteria, rank the various requests for IT Services application support. This is provided to IT Services as input to a complete planning process that establishes IT Services overall operational plan.

2.3.1.2) Governance

How Governance Drives the ITS Workplans



There are many sources or 'channels' that influence the overall workplans and productivity of the IT Services department. These include:

- BAAC (Business Application Advisory Committee) – who review operational project requests and provide advice on priorities
- BCIT - IT Steering Committee – who review larger, more strategic IT Investment opportunities for approval.
- Computer Lab User Committee – directs priorities for academic lab projects and configurations
- IT Services Annual Operating Plan & Budget – approved to provide specific levels of support for existing operational activities and some project related activities
- Institutional Budget Process – budgets and plans are approved that have direct implications to IT Services for implementation and support of technology
- IT Services needs to be ready to adapt to any new processes that are forthcoming from the taskforce that is reviewing and making recommendations on new processes for budgeting and operations planning.

2.3.1.3) Service Management – ITIL Processes

SERVICE SUPPORT				
Process	Description	Status	Maturity	CobiT
Service Desk (Function)	Service Desk is not a process but a function. The Service Desk's objective is to provide a single point of contact between users and the IT service organization. The book provides guidance about creating and operating a Service Desk to provide an efficient channel of communication between the user community and the IT provider.	Implemented 2004	3	DS8
Incident Management	The Incident Management process aims to restore normal service operation as quickly as possible and minimize the adverse impact on business operations. This ensures that the best possible levels of service quality and availability are maintained.	Impl 2006	3	DS8
Problem Management	The process of Problem Management diagnoses the underlying cause of the incidents identified by the Service Desk. It arranges for correcting errors in the IT infrastructure and performs proactive problem prevention.	Planned 2008	2	DS10
Change Management	The Change Management process ensures that standardized methods and procedures are used for efficient and prompt handling of all changes to minimize the impact of change related incidents on service quality. Consequently, change management aims to improve the day-to-day operation of the organization.	Impl. 2006	3	A16
Release Management	Good resource planning and management are essential to package and distribute a release successfully to the customer. Release Management takes a holistic view of an IT service change to ensure that all aspects of a release, technical and non-technical are considered together		2	A17
Configuration Management	Configuration Management provides a logical model of the infrastructure or a service by identifying, controlling, maintaining and verifying the Configuration Items in existence.		2	DS9

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TECHNOLOGY CHANGES EVERYTHING

The ITIL Framework (Information Technology Infrastructure Library) has been guiding the development and maturation of our IT Client Service offerings for a number of years now. This represents the most mature adoption of a control framework within IT Services. This can be largely attributed to the leadership, vision, and consistency of the Manager of Client Services to introduce and adopt this control framework.

2.3.1.3) Service Management – ITIL Processes

SERVICE DELIVERY				
Process	Description	Status	Maturity	CobiT
Availability Management	Availability Management's goal is to optimize IT infrastructure capability, its services and the supporting organization. This results in a cost effective, sustained level of service availability that enables the business to meet its objectives.		2	DS4 DS11
Capacity Management	Capacity Management enables an organization to manage resources in times of crisis and predict the need for additional capacity in advance. It describes the procedures necessary for planning, implementing and running this process.		2	DS3
IT Service Continuity Management	IT Service Continuity Management describes managing an organization's ability to continue providing a pre-determined level of IT service following an interruption to the business. This may range from an application or system failure, to a complete loss of the business premises.		2	DS4
Service Level Management	Service Level Management's goal is to maintain and improve IT service quality through a constant cycle of agreeing, monitoring and reporting IT service achievements. Service Level Management instigates actions to eradicate poor service and allow a stronger relationship to develop between IT and its customers.		2	DS1
Financial Management for IT Services	Financial Management is the sound stewardship of the organization's monetary resources and supports the enterprise in planning and executing its business objectives. Within an IT organization this process is visible in three main areas: Budgeting, IT accounting and charging.		2	DS6

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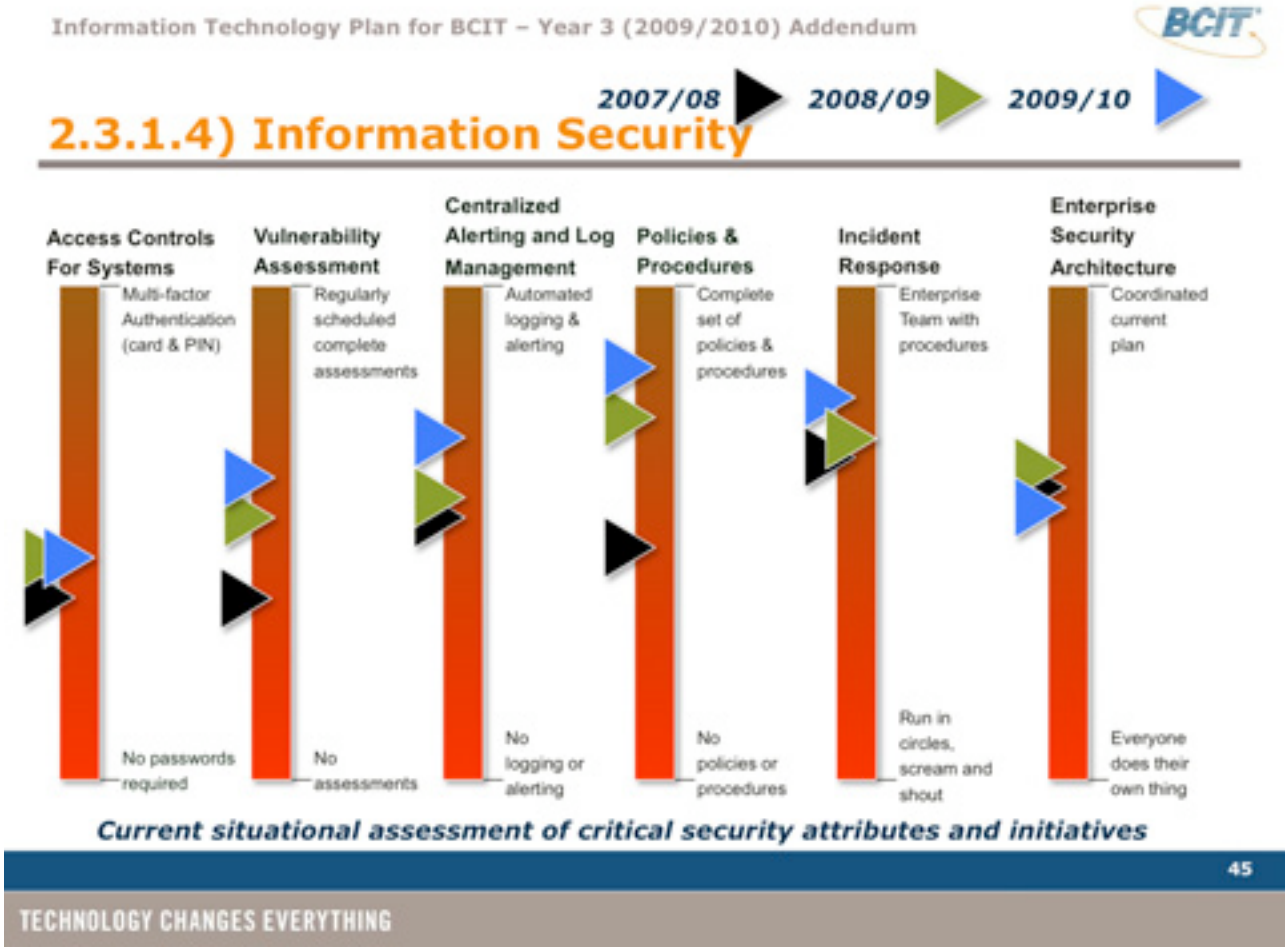


As with most organizations, whether public sector or private sector, ITS has a responsibility to ensure that the data and infrastructure used in the operation and management of BCIT is safeguarded against fraudulent use and malicious attacks. Failure to properly attend to IT Security can expose the Institute to the following risks:

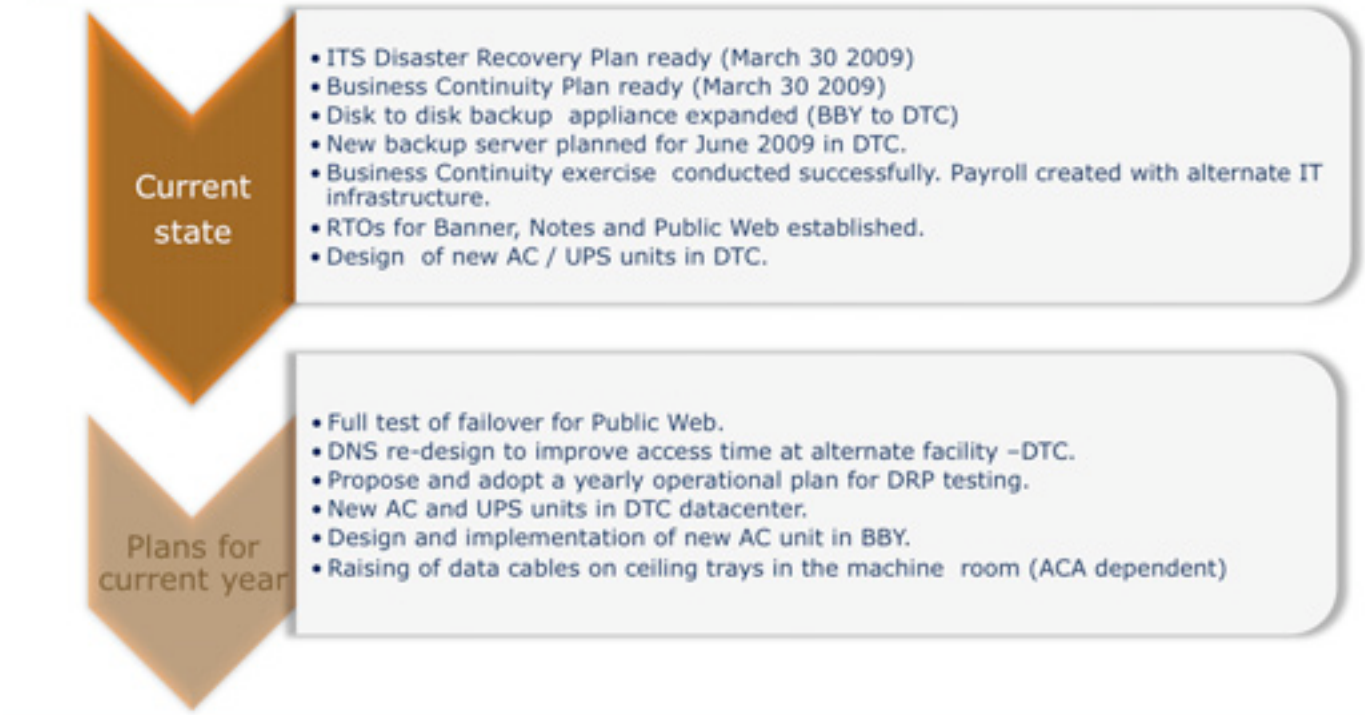
- loss or corruption of data
- compromised or disabled infrastructure and equipment
- identity theft
- significant disruption of business and educational activities
- potential litigation
- loss of trust and credibility with our stakeholders

The information above attempts to position BCIT's current progress in 6 specific areas of IT Security activities and initiatives that are aimed at managing the associated risks to the Institute. These 6 activities and initiatives are representative of BCIT's due diligence to secure and safeguard its IT assets and data.

Over the 2008/2009 year, specific progress has been made in the revision and review of the BCIT "Acceptable Use of Information Technology" Policy (Policy 3501) and the development and introduction of a Data Security and Classification Policy (Policy 3502). The Data Security Policy (Policy 3502) has been approved by the Board and assigned to the Audit Committee to determine how best to implement a reporting mechanism to inform that Board of any issues or risks.

The measureable slippage in 2009/2010 in the "Enterprise Security Architecture" is a reflection of a couple of things. Firstly, there are many more changes than usual happening at the enterprise network level related to projects to migrate from Novell to Microsoft, extensions to networks to reach tenants and the CARI facility, and some renewal of edge switch devices. These changes and their related complexities introduce some new challenges that need some attention. Better integration of the IT Security Office in the design of these changes will mitigate these issues going forward. Secondly, a rather comprehensive penetration assessment was performed in the 2008/2009 year which exposed more vulnerabilities than were known prior to the assessment. These vulnerabilities have now been enumerated and documented, and plans to address them are being developed.

2.3.1.5) IT Continuity



Our backup data centre (DTC) has now entered the operational stream. A deficiency was identified in the lack of proper AC and power quality, and plans are underway to remedy this condition. A new UPS and a new, 3-ton AC unit is being procured and installed. Target date is May 2009.

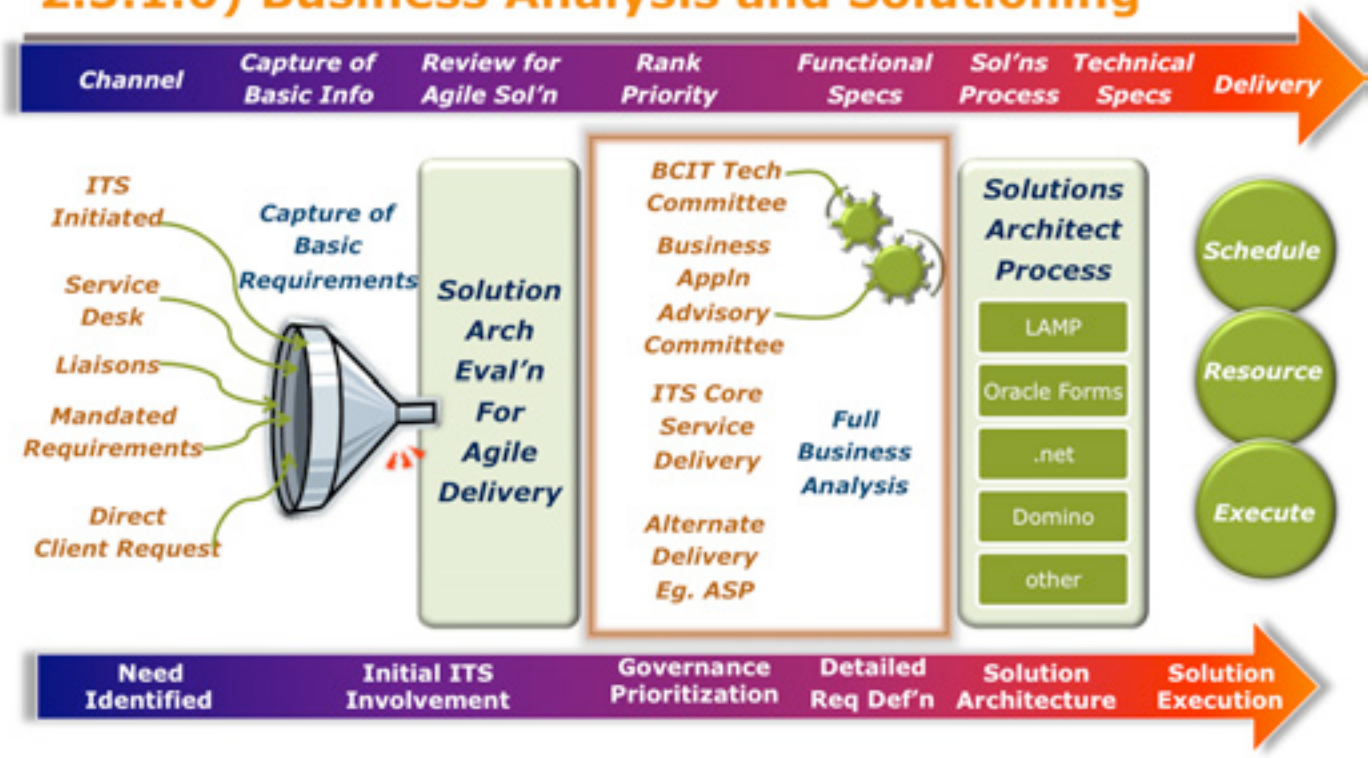
Also, last year we conducted a successful 'Business Continuity' exercise with the Finance department. Their payroll was created using our backup infrastructure downtown, and processes were tested as well.

A rally point project 'Business Continuity - Year 2' has completed some of the intended deliverables, while others will be finished before the end of March 09 (DRP plan in particular), and a few have been postponed: the fail-over test, which will demonstrate a network failover (again), and seamless Web failover.

There are no plans to add more BC functionality at DTC, other than to enrich what's already there: more Web presence, and add capacity to their disk-to-disk complex (BBY to DTC).

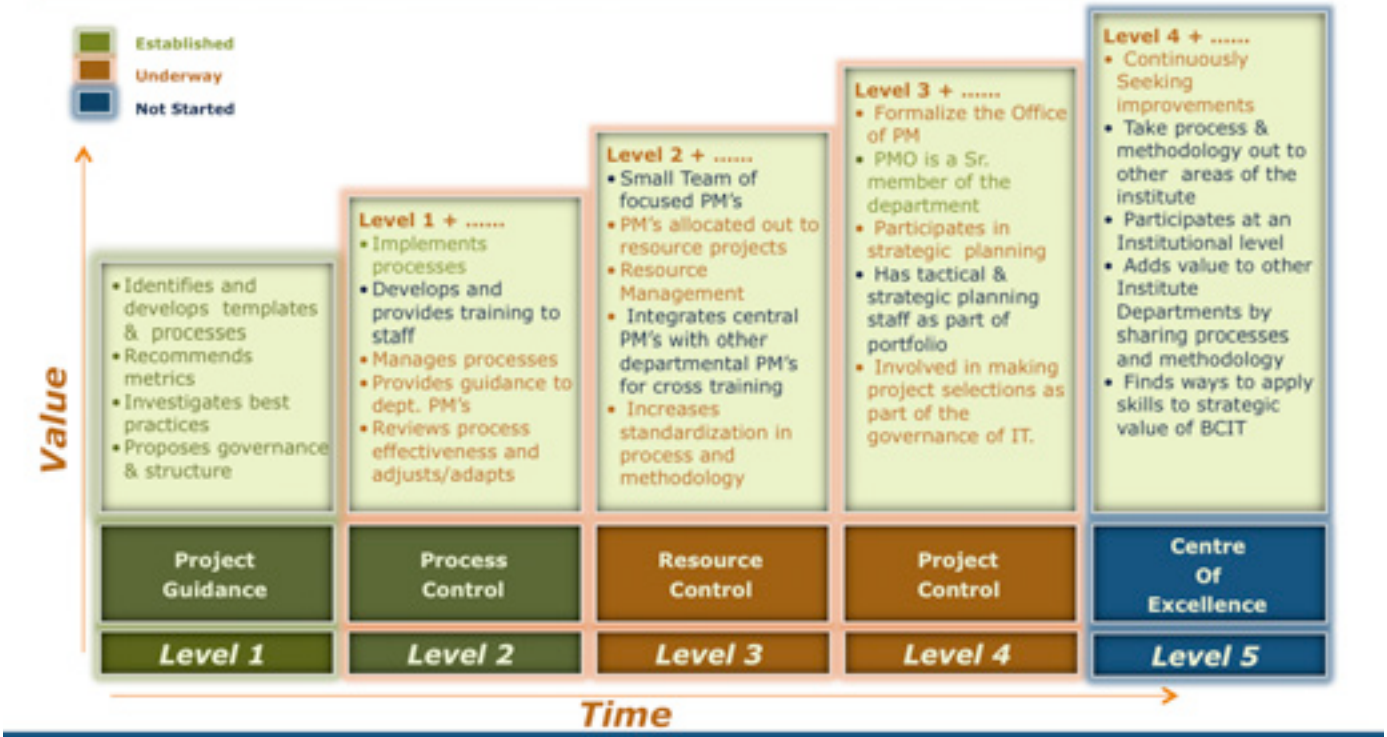
The Business Continuity Plan is being intricately linked with ITS Disaster Recovery Plan.

2.3.1.6) Business Analysis and Solutioning



With the recent addition of a "Solutions Architect" (SA) in 2008, IT Services will provide more consistent, higher quality, and more supportable solutions to clients academic and business needs. This will allow all requests to flow through a process where they can be assessed by a team of technical solution specialists to determine "best fit" for a particular set of technical requirements. This process has also been designed with the intent that if a particular solution is obvious, the SA Group can move it forward for execution rapidly, avoiding unnecessary delays in process.

2.3.1.7) Program and Project Management



Progress toward a fully implemented PMO has continued over the 2008/2009 academic year as reflected in the CMM (Capability Maturity Model) above. In this past 12 months, a department wide Resource Planning system has been implemented to better project resource allocations and requirements to projects and initiatives over the coming 6 to 12 months. The Manager of the PMO retired in December 2008. The role of the Manager PMO has been reviewed and expanded, and recruitment is expected during the second calendar quarter of 2009. This will be an opportunity to further bootstrap the practice and methodology to a higher level of maturity.

ITS is planning on harvesting 2 to 3 dedicated Project Managers (PM's) from its current complement of staff. This will allow those 2 or 3 individuals to focus solely on project management – allowing them to further develop and refine their skills, in turn improving the quality of project management and with it, the quality of the deliverables from ITS that are subject to project management. It will also change the current model whereby at any one time, there could be 8 to 12 individuals in the department who are all doing a small amount of project management work on specific projects along with their other operational and delivery requirements.

2.3.1.8) Organizational Change Management

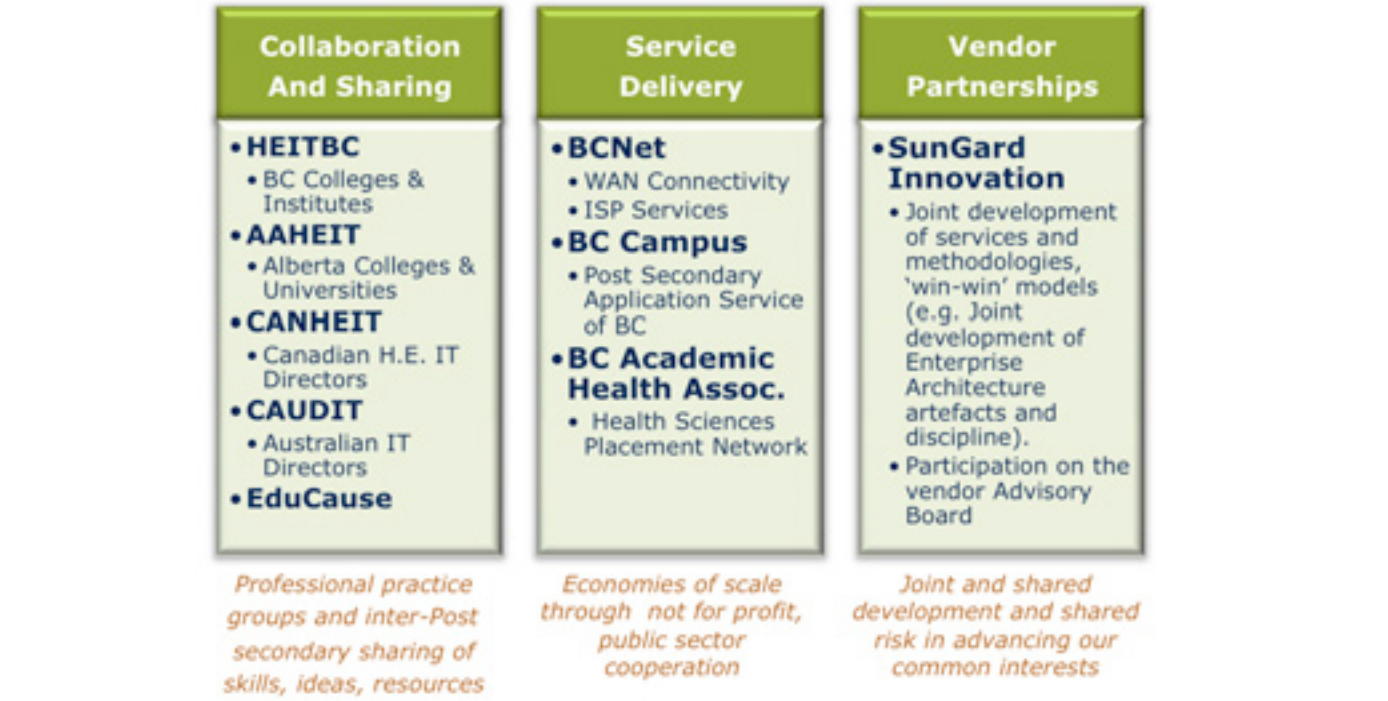
- Organizational change management is the discipline of planning for and responding to changes that impact people, processes and the organization with the goal of minimizing the negative effects of the change and accentuating the positive
- While ITS has made significant progress on processes around technology change management, ITS has not established any formal organizational change management practices
- ITS has established an internal "Employee Survey Response Team" (ESRT). This group has been constituted to provide a venue for ITS Staff input and feedback to departmental processes and decisions.

Many IT initiatives and other projects fail because people and processes are not properly considered. Lack of a disciplined organizational change management approach is often sited as one of the top ten causes of project failure.

This is an area that is being considered for focused attention within the Strategic Practices group of IT Services. Following the same process as other disciplines and practices that have started in Strategic Practices, the discipline of Organizational Change Management will emerge as a separate practice accompanied by a Capability Maturity Model to lay out a roadmap for the fostering, development and maturation of these activities until they are fully assimilated into the culture and practice of IT Services.

2009/2010 will be the beginning of the formal activities to structure a discipline around Organizational Change Management. IT Services will look to leverage existing expertise and skills resident in areas of BCIT such as Organization and People Development.

2.3.1.9) Partnerships and Collaboration



BCIT participates with a number of external groups and agencies in partnership to achieve common goals and benefits. The graphic above delineates these partnerships based on the core attribute of the relationship.

Collaboration & Sharing: This group of organizations are collections of other Higher Education Information Technology consortia and not-for-profit groups. These groups provide forums and professional development opportunities for sharing ideas, assets, processes, skill sets, and knowledge across a broad spectrum of discrete Higher Education Information Technology departments.

Service Delivery: BCIT participates with these organizations in the design and delivery of a number of shared services that directly benefit BCIT, as well as benefiting our Higher Education community in BC.

Vendor Partnerships: BCIT has been invited to participate in a number of strategic initiatives with our primary administrative systems vendor, Sungard Higher Education. IT Services at BCIT has developed a strong reputation for being leaders in many areas and disciplines. Our colleagues from other Post Secondary IT organizations often look to us to provide guidance, training and mentoring. This has been recognized by Sungard as well – and we hold a prestigious place at their table. We are members of an exclusive "Advisory Board". We have been invited to participate in joint development of new functionality. We have co-developed service offerings in the area of Enterprise Architecture.

2.3.1.10) Application Sourcing - Options

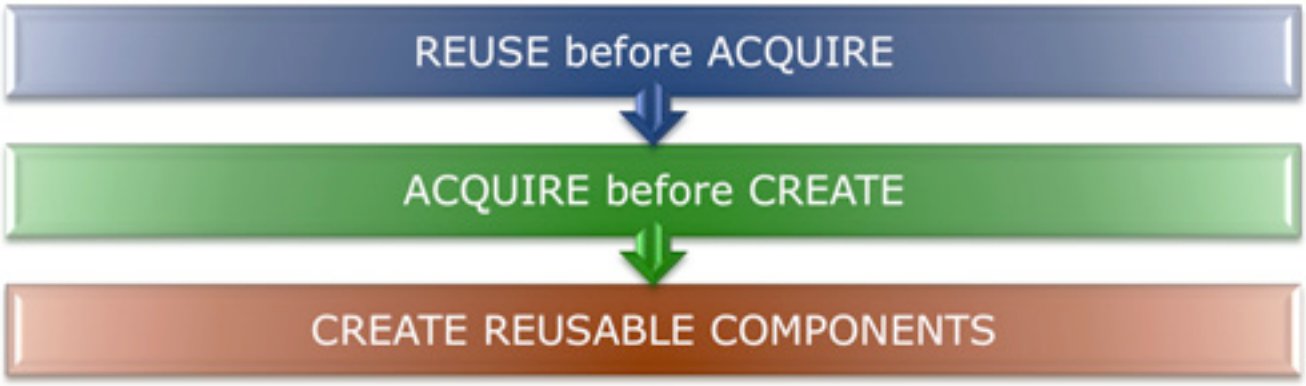
Application Source	Attributes
In-Sourced	Technology for delivering the application service resides at BCIT and is centrally controlled and supported by IT Services (eg. Banner, Lotus Domino, Public Web, etc)
Shared Sourced (Federated)	Technology for delivering the application service resides at BCIT and/or in multiple locations and uses a shared model for funding, control and support (eg. Archibus, Bookstore, Library, etc)
Out-Sourced	Technology for delivering the application service resides external to BCIT and is centrally and/or departmentally funded with a service provider managing control and support (eg. Marqui Web Publishing, Intelresponse Q&A, Omniture Web Analytics, etc)

The options for sourcing new and improved application systems and functions vary significantly. Traditionally, many organizations have made concerted efforts to host the applications required for the business within the internal (In-Sourced) I.T. department and infrastructure. However, the growth and maturation of the delivery of software applications, functions and features over the Internet has led to a significant rise in the number of critical business applications being offered in a "Software as a Service" model (SaaS) also known as "Cloud Computing".

Many IT shops are recognizing the advantages the Out-Sourced model plays in their ability to be agile and meet the fast changing needs of their clients. With a Cloud Computing or SaaS model, there is none, or no significant need for capital investment in infrastructure that would typically be required with an in-house developed solution. This also means that there is no need to schedule and budget for a technology refresh. The start-up time is often measured in days or weeks rather than in months as it is with in-house solutions. Cloud Computing and SaaS can relieve your already stretched IT Staff from having to learn additional technical skills, or from the organization having to increment its staffing to acquire specific technical skills. And because the start-up investment is so low, it is much easier and even appealing to "change horses" sometime in the future if a better solution presents itself in the marketplace. This means it is much easier and less costly for your organization to take advantage of new developments and features that would be difficult or impossible if you were tied to a single vendor in an in-house deployment.

The downside of this model is that as an organization; you don't accrue any specific 'asset' such as a software system. It is best likened to the difference between buying and owning a car (the in-house model) with leasing a car (the SaaS model).

2.3.1.10) Application Sourcing – Based on EA Principles



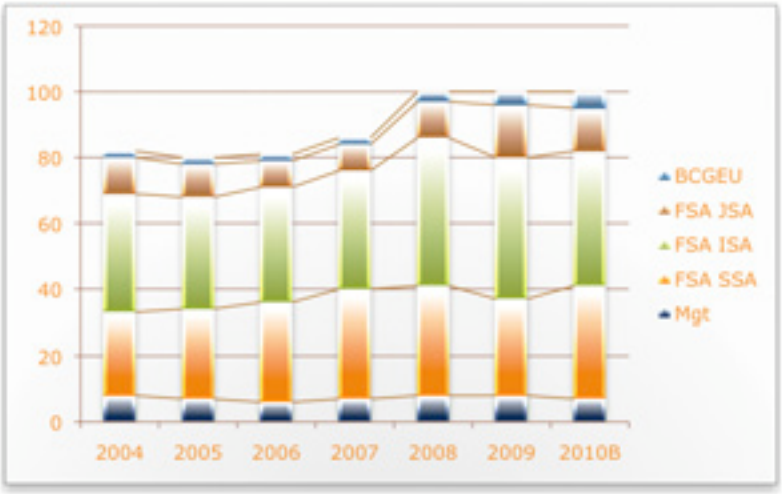
This represents the basic principles and philosophy that IT Services will apply through the EA (Enterprise Architecture) and SA (Solutions Architecture) practices when looking to provide a solution for clients academic or administrative needs. This is intended to leverage the value and functionality of our existing assets as well as existing skill sets, while keeping the environment from becoming more, and unnecessarily complex.

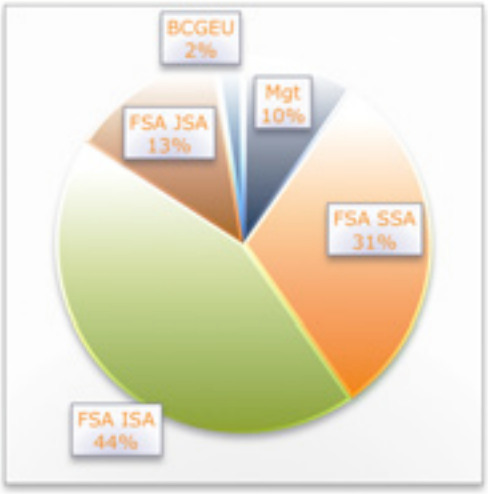
2.3.2) People and Financial Resources

- 2.3.2.1 - Staff Composition
- 2.3.2.2 - Retirement Eligibility
- 2.3.2.3 - Operating Expenses
- 2.3.2.4 - Capital Expenditures
- 2.3.2.5 - Growth Comparisons

The following section provides details on the human and financial assets and activities of IT Services.

2.3.2.1) ITS Staffing Mix





- Head count CAGR is 4% from 2004 to 2009

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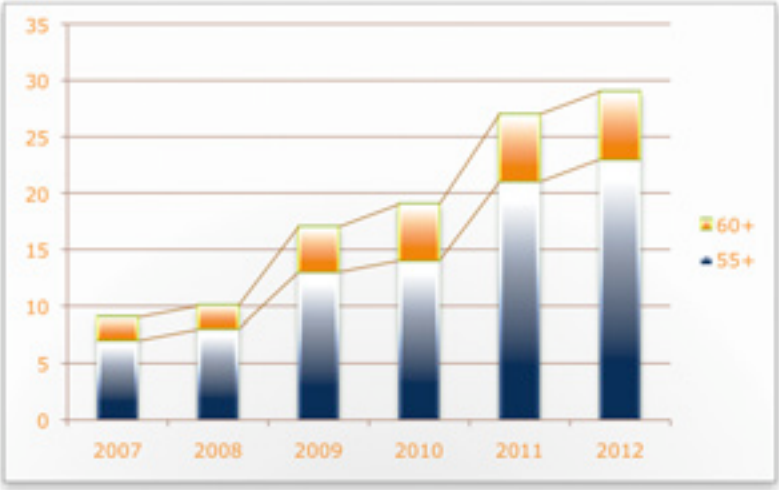
TECHNOLOGY CHANGES EVERYTHING

While the total funded headcount of the IT Services staff complement did not change from 2008 to 2009, nor is it projected to change into the current year (2010), the composition of the staff complement has changed slightly as a result of retirements, acquisition of Telecom staff as a result of the transfer of Telecom to IT Services, and a series of FSA staff reclassification outcomes.

2.3.2.2) Retirement Eligibility



- Cumulative numbers of employees over 55 and 60
- Note these are calendar years
- 4 out of 7 managers will be 55 by 2010
- There are 16 staff members that will be 55 or older by 2012 that already have 15 or more years of service and experience at BCIT *(as of March 2009)*
- Current complement represents 1,061 years of service to BCIT *(as of March 2009)*.
- Staff that will be 55 or older by 2012 currently represent 395 years of experience and service to BCIT. *(as of March 2009)*.

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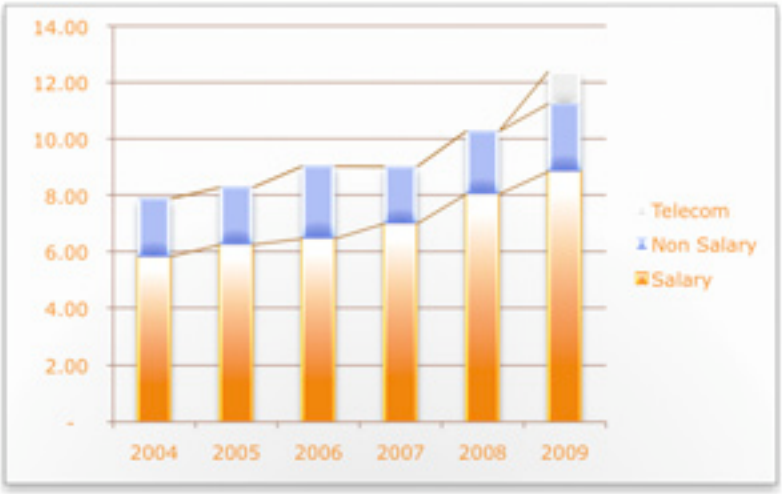
TECHNOLOGY CHANGES EVERYTHING

The aging workforce is evident in the IT Services complement of staff. By 2012, there will be 23 individuals within IT Services that are age 55 or older. Of those in that category, 16 of them already have 15 years of service or more.

As these individuals decide to retire, there will be a significant loss of tacit knowledge and experience. Harvesting that knowledge and experience should be an activity of an Institute wide succession management campaign and program.

2.3.2.3) Financial Resources – ITS Opex



- Operating Expenditures CAGR from 2004 to 2009 is 9.65% with Telecom added
- Telecom transferred to IT Services in 2009 – represents a non-salary increase of approximately $1.152M and a salary increase of approximately $105K.
- Labour costs per headcount have risen at a CAGR or 4.5% over the same period due to salary scale increases, increment progression, reclassifications, addition of 2 positions to support telecomm, and changes in workforce composition

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TECHNOLOGY CHANGES EVERYTHING

While the slope of the trend line on the bar graph above makes a significant vertical shift for the 2009 fiscal year, a significant portion of that can be attributed to the patriation of Telecomm to IT Services. The transfer of Telecom resulted in an increase to IT Services total budget of approximately $1.25Million .

The change in the “salary” component of the bar chart can be attributed to staged increases to headcount that were initially approved in 2007/2008. There were 5 positions approved that year, though IT Services was able to run without filling all of them immediately. They were filled and therefore expensed across the last 2 fiscal years.

2.3.2.4) Capital Replacement Cost Analysis

	Replacement Value	Annual Replacement
5 Year Cycle		
Network	3,300	660
4 Year Cycle		
Desktops Admin	1,534	384
Desktops Lab	3,059	765
Macs	637	159
Servers	1,686	422
SAN	670	168
3 Year Cycle		
Laptops Admin	1,405	468
Laptops Lab	179	60
Total	12,470	3,085
Weighted average cycle	4.04	

Dollar amounts represented in 'thousands'

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TECHNOLOGY CHANGES EVERYTHING

IT Infrastructure requiring Capital funding for replacement/renewal have varying EUL's (expected useful lives). The information above identifies each of the major components of infrastructure requiring regular replacement/renewal grouped by the EUL timeframe/cycle. It further annualizes the renewal amount that should be targeted and accrued into a Capital Renewal Fund for these items.

2.3.2.4) Detailed 5 Year Capital Funding Plan

	2010	2011	2012	2013	2014	Total
Renewal Desktops	3,129	2,656	1,876	1,488	1,964	11,114
Renewal Network	605	725	830	460	400	3,020
Renewal Servers	100	315	240	250	115	1,020
Renewal Storage	350	250	70	-	325	995
Total Renewal	4,184	3,946	3,016	2,198	2,804	16,149
Growth Network	115	125	55	65	55	415
Growth Servers	-	93	186	186	186	651
Growth Storage	95	410	95	175	95	870
Total Growth	210	628	336	426	336	1,936
Total Growth and Renewal	4,394	4,574	3,352	2,624	3,140	18,085

The details above lay out a 5 year Capital Plan to realize the renewal and replacement of centrally supported IT infrastructure. This assumes a continued growth (net 'add') of components over that time based on the following assumptions:

- All costs based on current (2009) replacement costs
- All values are in Canadian dollars
- All equipment is purchased not leased
- Discount rate of 8%
- Net sales tax rate of 8.55%
- Growth assumptions:
    - Existing business: existing services
    - Desktop growth accommodated through Citrix (use of student technology)
    - Storage 30-40% CAGR
    - Network – accommodated through new technology as part of renewal

2.3.2.5) Growth Comparisons – Resources vs. Outputs

GROWTH		
Area	From to 2008	CAGR
Headcount	2004	5%
Operating Expenditures	2004	7%
End Devices	2004	11%
Computer Labs (fully supported)	2004	7%
Network Devices	2004	42%
Operating Systems Instances (Servers)	2005	21%
Storage	2005	54%
Web Pages	2003	17%
Web Traffic	2002	93%
Web Publishing Activity	2004	545%

The relative growth of services and IT infrastructure supported by IT Services far outstrips the rate of growth of the headcount and operating budget/expenditures of IT Services over the same period of time.

2.3.3) Information Technology Services

- 2.3.3.1 - Catalogued Services
- 2.3.3.2 - Other Services

The following section details the services that are provided by IT Services to our clients and stakeholders.

Service Catalogue

SERVICE DESK	
Incident management, service request & dispatch	Single point of contact for all clients to access IT support
Administrative ID management	Management of ID requests for administrative users
Academic ID management	Management of automated IDs for academic users
IT INFRASTRUCTURE SERVICES	
Network and internet connectivity	Physical network infrastructure management
Server support	Novell, Windows, VMWARE and Unix server management
Central data storage, network file backups and restores	Network storage system management

With the adoption of the ITIL control framework within our Client Services area, a specific deliverable was the publication of the IT Services "Service Catalogue" that describes the default Service Level Agreement (SLA) between IT Services and our clients and stakeholders. This and the next 4 slides describe the current condition and status of the various services listed in the Service Catalogue as well as some non-catalogues services.

Service Catalogue

Printing Services	
Administrative printing	Staff and Faculty printing to networked laser printers and multi-function devices (photocopiers) in office environments
Student pay printing	Student printing – general access
Private lab printing	Student printing – specialty/ restricted access labs
Telecommunication Services	
General Telecom	Standard telecom services (digital and VoIP phones, voicemail and specialty services e.g. 1-800, conference calling, ACD queues, etc.)
Mobility Services	Management of BCIT owned cell phones and other mobility devices

Continued from previous page.

Service Catalogue

Desktop Services	
Administrative software images	Development of administrative (office) desktop and laptop images
Academic software images	Development of academic (lab) desktop images
Administrative computer provisioning and management	Office computer standards, net-new and replacement rollouts, and moves
Computer Lab provisioning and management	Lab set-ups, maintenance, replacement, physical security
Hardware warranty and repair	Coordination of hardware repair activities
IT asset inventory	Collection of all BCIT asset computer hardware inventory information
Messaging Services	
E-Mail and calendaring	Application management (installation, customization and sustainment) that support email and calendaring
Blackberry syncing	Lotus notes e-mail and calendar syncing for Blackberry devices
Instant Messaging	Application management (installation, customization and sustainment) that support instant messaging

Data Current as of: April , 2009

Continued from previous page.

Service Catalogue

Application and Database Services	
Business applications	Application management (installation, customization and sustainment) that support business services
Learning management systems	Application management (installation, customization and sustainment) that delivers technology based learning services
Web Services	
Web and portal	Development and management of BCIT web properties
Website development	Web application design, development and integration
Web marketing & analytics	Web marketing strategy and marketing production services
Web content publishing	Web content management and support of the BCIT web publishing community
Collaboration tools	Application management (installation, customization and sustainment) that support CoPs, instant messaging, Blogs, and shared file storage

Continued from previous page.

Service Catalogue

STRATEGIC PRACTICES	
Business architecture	Needs assessment, needs analysis, requirements definition, process mapping and process Improvement
Enterprise architecture	Guidance, consultation and approval of IT investments in people, process and technology
Enterprise IT security	Coordination of activities ensuring the general security and ongoing integrity of the IT infrastructure, systems and data
Program management office (PMO)	Project governance and IT Services project management
BUSINESS CONTINUITY	
Business continuity and disaster recovery planning	Development and execution of Business Continuity plans to ensure continued delivery of IT Services

Continued from previous page.

Non-catalogued Services

Additionally, IT Services provides systems development support and delivery, but not published through the Service Catalogue. These services as allocated and assigned based on priorities, requests, and advice coming through a variety of governance bodies (BAAC, IT Steering Committee, etc) and the ITS Operations Plan.

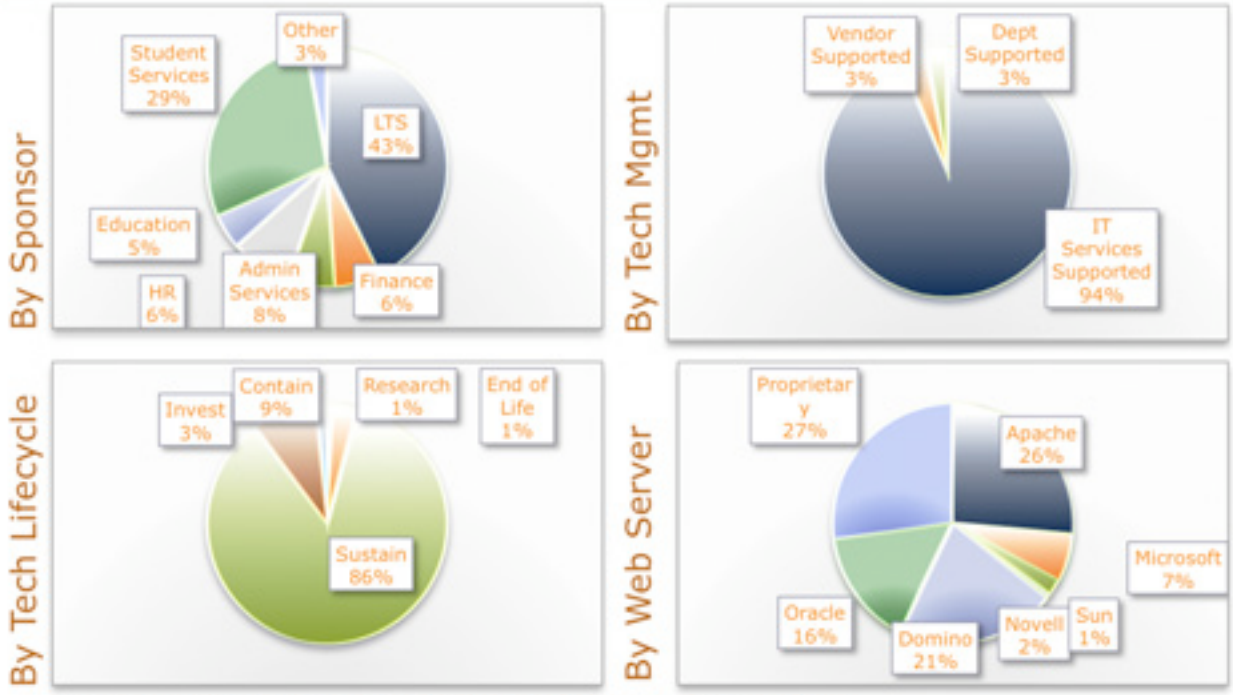
There are also some services that while centrally controlled and managed, are non-IT Services functions and are therefore supported and managed elsewhere in the Institute (i.e. LTC, Print Services, etc).

2.3.4) Software Applications

- 2.3.4.1 - Application Profile
- 2.3.4.2 - Banner - Enterprise Resource Planning
- 2.3.4.3 - Asset & Facilities Management Applications
- 2.3.4.4 - Library and Book Store Applications
- 2.3.4.5 - Email & Calendaring Applications
- 2.3.4.6 - Learning Management Applications
- 2.3.4.7 - Collaboration Tools
- 2.3.4.8 - Web Properties
- 2.3.4.9 - ITS Applications
- 2.3.4.10 - Application Development Environments – Banner, Notes/Domino, LAMP etc

The following section provides details on the application systems, their currency, relationship to each other, and underlying development environments that are centrally supported by IT Services.

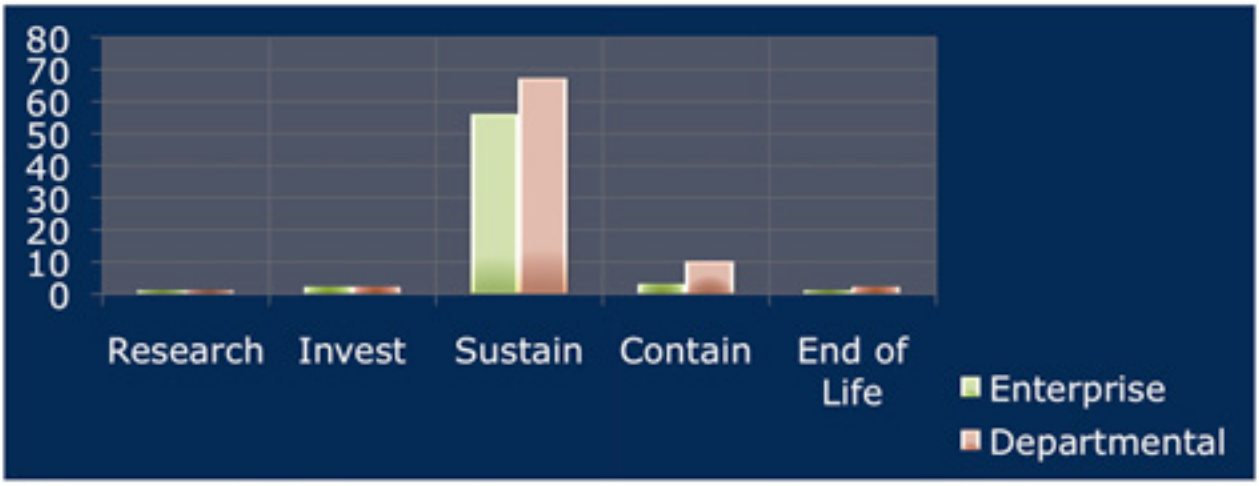
2.3.4.1) Application Profile



Based on known and current application portfolio matrix as of April 2009

BCIT has an extensive application portfolio. The charts above identify and delineates the attributes of that portfolio across four different views or dimensions.

2.3.4.1) Application Profile by Lifecycle Stage



Technology Mgmt	# Applications	Percentage
Enterprise	62	43%
Departmental	82	55%
Innovative	2	2%

This graphic distributes and represents the application portfolio horizontally (the 'x' axis) across a scale that describes the 'lifecycle' state that the various applications are currently in. Typically, the lifecycle flow sees applications moving from left to right, from "research" through to "end of life". Vertically (the 'y' axis) represents the 'count' of catalogued applications that fall into each stage of the lifecycle.

Within the body of the graph, there are 2 separate vertical bars in each lifecycle stages. One represents "Enterprise" applications meaning they are typically deployed broadly across the organization and are fully supported and funded centrally (i.e. Banner, Lotus Notes, etc). The other represents "Departmental" applications meaning they are typically meeting the business needs of one or just a few departmental business or academic units, and typically jointly supported and funded between IT Services and benefactor department(s) (i.e. Bookstore, Library, etc.).

There is another category of application system called "Innovative" – which is a place for experimentation and entrepreneurial exploration. These are typically not supported nor funded centrally at all. Since the number of "Innovative" applications is so small, it does not present itself on the graph above.

2.3.4.2) Application Currency – Banner ERP Example

ERP Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Banner Finance	1996	Aug 2008	7.4	Aug 2010	8.3	8.1
Banner General	1992	Aug 2008	7.5.1	Aug 2010	8.3	8.1
Banner HR/Payroll	1999	Aug 2008	7.2.6	Aug 2010	8.3	8.1
Banner Position Ctl	1999	Aug 2008	7.3	Aug 2010	8.3	8.1
Banner Student	1992	Aug 2008	7.4	Aug 2010	8.3	8.1
Banner Student A/R	1992	Aug 2008	7.3	Aug 2010	8.3	8.1
Web for Employee	2006	Aug 2008	7.3.6	Aug 2010	8.3	8.1
Web for Faculty	2006	Aug 2008	7.4	Aug 2010	8.3	8.1
Web for Student	2006	Aug 2008	7.4	Aug 2010	8.3	8.1
Document Mgmt	2008	Sep 2008	7.4	Aug 2010	8.3	8.1
Workflow	2008	Oct 2008	4.4.1	Aug 2010	8.3	8.1
Luminus (myBCIT)	2004	Dec 2008	4.1	Oct 2009	4.2	4.2

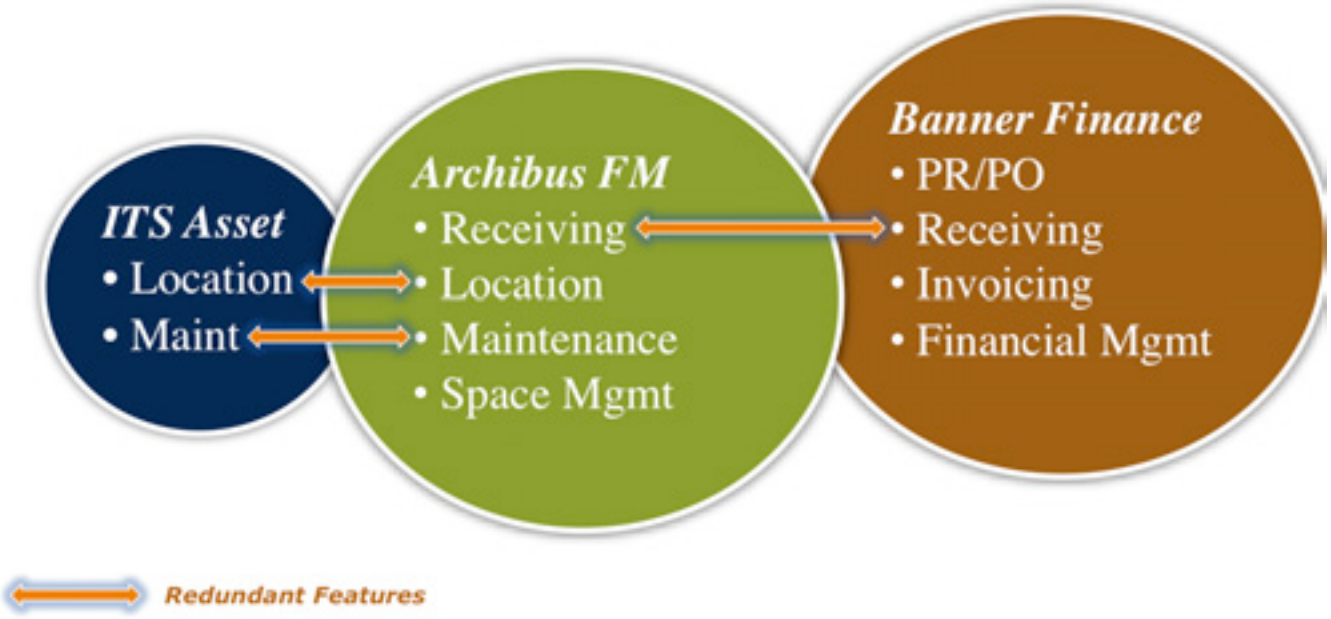
IT Services has a practice of ensuring that our primary and mission critical systems remain current in order to ensure that we are able to leverage all new features and functions, as well as to ensure that we remain in a 'support model' from the vendors of the systems. Many software vendors have moved to a practice of supporting their most current release and one release back. This is deemed necessary by the vendors to ensure that they are not diluting their skill, talent and productivity pools supporting back versions that are poorly subscribed. For BCIT, this means a significant amount of effort on the part of both the IT Services teams, as well as the functional/end-user departments is consumed installing, testing and implementing newer versions of our systems.

2.3.4.3) Asset and Facilities Management

Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Workplace Mgmt – Archibus FM	1998	2004	16.3.90	2009	17.1.193	17.1.193
Workplace Mgmt – FM Works	2005	2008	2.12.1.19	2009	2.12.1.20	2.12.1.20
Workplace MGMT – FM Web Central	2007	2007	16.3.90	Nov 2009	17.2.279	17.2.279

The system that is being used for Workplace Management and also used to track some Capital Assets is a product called "Archibus". This system has been stewarded by the Facilities department until late in 2008, at which time it was moved over, including budget and staffing, under the control and responsibility of Finance. Currently, analysis is underway to determine what would be required to repatriate this system to ITS Services for full enterprise level support.

2.3.4.3) Asset Management – Banner, Archibus, etc



The Archibus system has significant overlap in functionality and features to the Banner Finance applications. In some cases, there is application feature / function overlap between multiple applications. This is typically where two different commercial packages both span some common area of functionality, though they share little else in terms of their overall application features and design. Such is the case with Banner and Archibus when it comes to Asset Management. Archibus as a Workplace Management Tool has included in its feature set, the ability to record and track the condition of organizational assets. Banner's ERP functions in the Purchasing and Finance modules also provides very similar functionality. It is critical to ensure that the data being kept and managed by one of these applications is accurate in the other.

2.3.4.4) Application Currency - Library & Bookstore

Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Bookstore – WinPRISM	2004	2009	1.7.3.1	2009	1.8.0.0	1.7.3.1
Bookstore – WinPOS	2006	2009	1.7.3.1	2009	1.8.0.0	1.7.3.1
Bookstore - WebPRISM	2000	2009	3.0	2009	4.0	3.0
Library – Innopac	1998	2008	2007 Release 1.2	2009	-	2007 Release 1.2
Library – IRIS	2006	2007	2007 V2.17.0	-	-	2007 V2.17.0
Library – Archives DB	2005	None	2009 Version 11	-	-	2009 Version 11

The table above describes the state of two of the primary applications that fit into the “departmental” support model. These two systems have unique support arrangements and models between the departments that own them (the Bookstore and the Library) and the vendors that provide the applications. In these cases, the vendor schedules and performs the upgrades remotely and independent of any resources from BCIT other than the requirement for secured connectivity to the Internet.

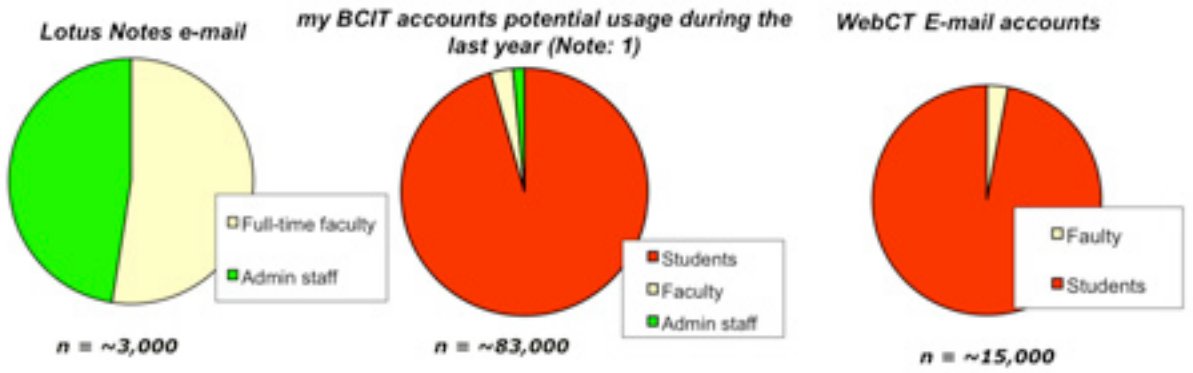
2.3.4.5) Application Currency – Email and Calendaring

Application Module	Implement Year	Last Upgrade Date	Current BCIT Release	Next Upgrade Date	Next Upgrade Release	Current Vendor Release
Lotus Notes Domino Server	1996	Dec 2008	8.5	unknown	unknown	8.5
myBCIT Mail (comexpress)	2004	Dec 2008	6.2	Q3 2009	6.3	6.3
WebCT Mail	2001	2006	CE 6.2.3	End of Life	End of Life	Vista

The table above describes the current stat of our various, centrally supported email and messaging systems. The WebCT Mail is end-of-life as the entire WebCT Learning Management Suite is being replaced with the new D2L (Desire to Learn) Learning Management Suite. While there is an email feature within the new D2L Learning Management system, it has not been enabled to work as a full email client. It is only available for students within a course to communicate with each other.

Additionally, email and messaging is due for a full review as part of the 3 Year Plan for Technology roadmap activities.

2.3.4.5) Email & Calendaring Capabilities



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Note 1: During the December 2008 myBCIT upgrade, only accounts with activity in the prior 2 years were imported. As a result, the number of accounts was reduced from 600,000 to 80,000.

The email & calendaring environments at BCIT are spread out over 3 different supported domains. The predominant domain is the Lotus Notes domain used by faculty and staff. The second most prominent is the myBCIT email domain. While there are more myBCIT email users than Lotus Notes users, the frequency of active use of myBCIT email is far lower than that of Lotus Notes. It is believed that is due to the fact that most students already have an existing email address (eg, Hotmail, Gmail, Excite, Yahoo, etc) and prefer those. A number of the myBCIT email users are merely auto-forwarding their mail to their other email addresses. The numbers reported for WebCT email will disappear when WebCT is fully decommissioned. By the fact that WebCT users also must have a myBCIT ID, all of the approximate 15K users are duplicated in the count of myBCIT email users.

Within the Lotus Notes email domain, the following information tries to provide some insight into the usage patterns of the faculty and staff.

Number of Lotus Notes email accounts: approx. 3,000 <April 09>

Number of email messages delivered from Lotus Notes Annually: approx. 40Million

Number of those email messages sent from Lotus to Lotus (internal) Annually: approx. 21.5Million (approx. 54% of all Lotus Notes email)

Number of those email messages sent from Lotus to an external domain (external) Annually: approx 18Million (approx. 46% of all Lotus Notes email)

Total volume by size of email handled by Lotus Notes Annually: approx. 1,809 Gigabytes

2.3.4.6) Learning Management – Application Features

In 2008/2009, the Institute implemented a locally hosted instance of Desire 2 Learn (D2L). This will see the WebCT environment retire over the next 1 to 2 years. The other Learning Management systems listed (TLM, Elluminate, Maplesoft) all perform specific vertical functions within the Learning Management domain.

2.3.4.7) Collaboration Tools

	Xythos Webfiles (Retiring 09/10)	Share-Point (Intro-ducing 08/09)	Novell WebShare (Retiring 09/10)	Novell Share-in/Out (Retiring 09/10	Lotus Quick-place	Lotus Same-time	myBCIT	Blogs/ Wikis	WebCT (Retiring 09/10)	Desire 2 Learn
Secured File Access And Sharing	☑	✓	☑	☑	✓			✓		✓
Shared Desktops	Retiring	✓	Retiring	Retiring	✓				Retiring	
Threaded Discussions (Asynchronous)		✓			✓		✓	✓	☑	✓
Instant Messaging (Synchronous)		✓				✓	✓			
Publish to the Web	☑	✓	☑		✓			✓		✓
Document Control e.g. Versioning	☑	✓	☑		✓			✓		
Multi-user publishing	☑	✓			✓			✓		✓

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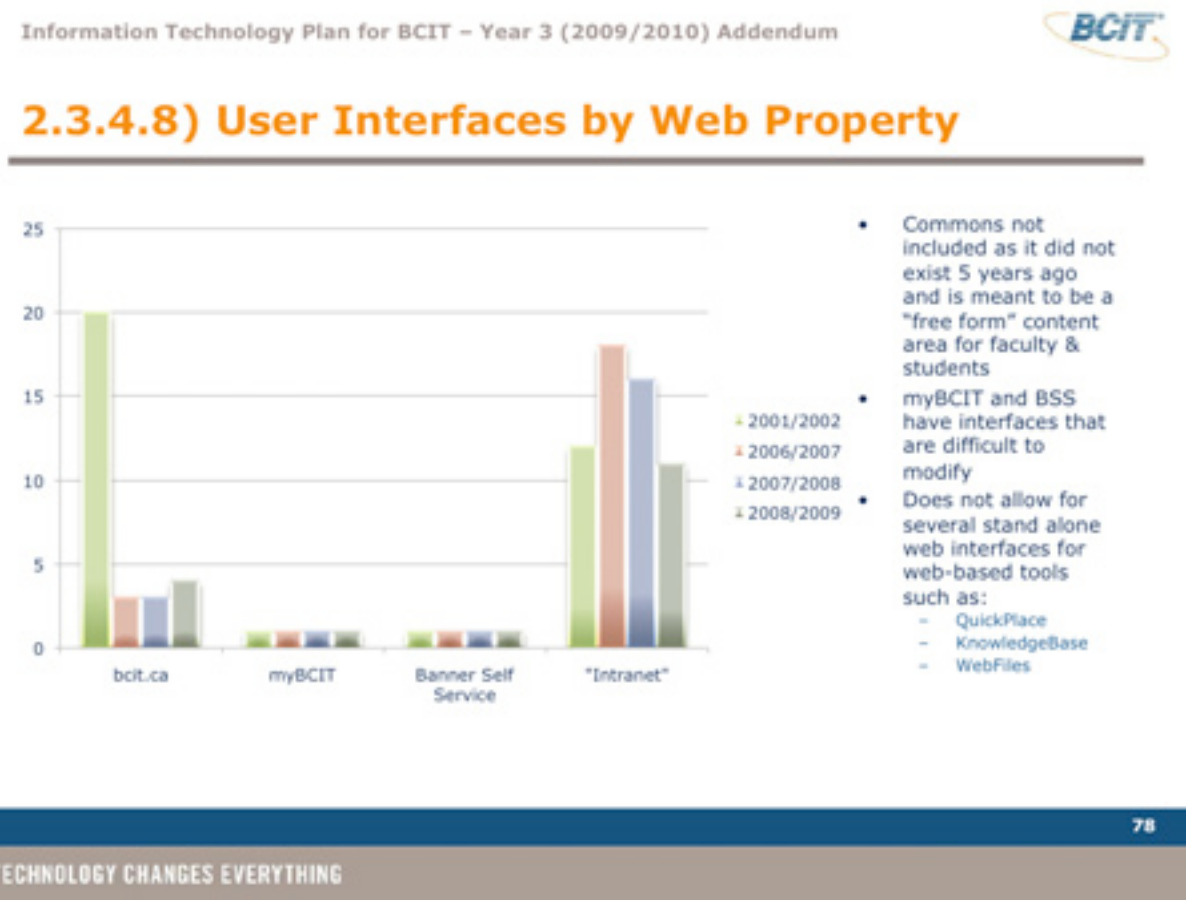
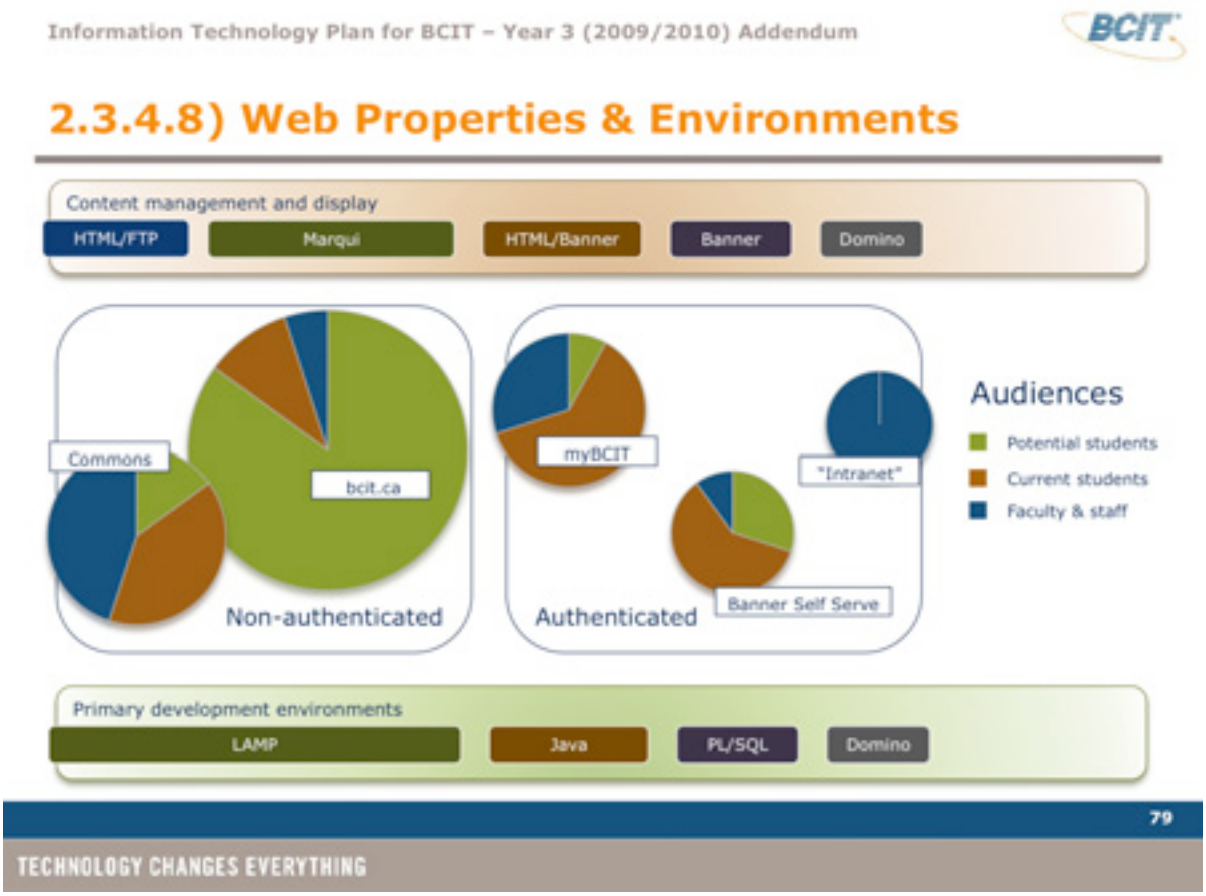
TECHNOLOGY CHANGES EVERYTHING

IT Services often supports a number of tools in each area of delivery of services. For example, with respect to Collaboration services, IT Services currently supports at least 10 different systems that deliver one or more collaboration features. This situation has evolved for a number of reasons. With the adoption of an Enterprise Architecture (EA) discipline, and the proclamation of an EA principle to 'reduce complexity of our IT environment' where ever possible, we have started to look at feature comparisons such as the one above, with a view to systematically, after careful analysis, reduce the number of supported environments in order to reduce redundancy and thereby simplify the environments that need to be supported by IT Services without negatively impacting our stakeholders. There are opportunities for even greater convergence going forward.



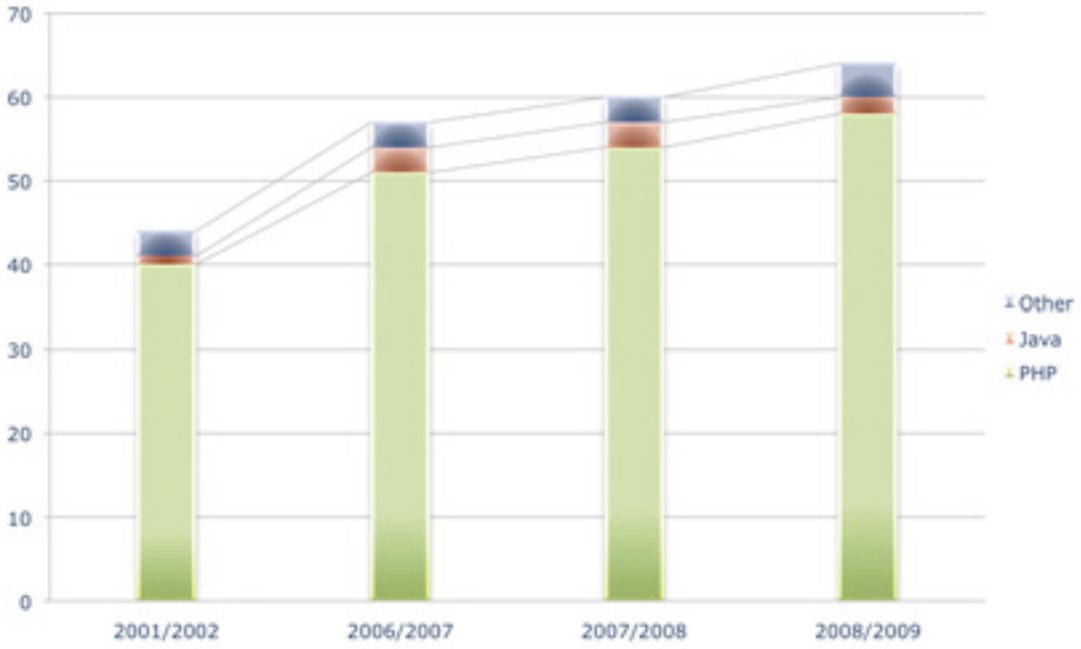
In 2007/2008, the Professional Development registration system (http://notesmail.bcit.ca/apps/prodevsys.nsf) was changed to match an existing interface, reducing the total number of Intranet interfaces by one.

New interfaces were introduced to BCIT for specialty blogs and whatwouldyouchange.ca promotional site. Counts on intranet have reduced as a couple more applications were switched to match current interface of public website.



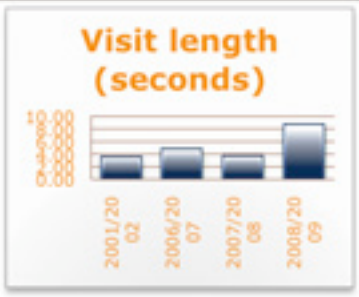
In 2008/2009, a conscious decision was made to implement Microsoft Sharepoint as a collaboration tool. This is expected to result in the emergence of a ".Net" environment over the coming years to supplement the existing environments listed above.

2.3.4.8) Public Web Applications by Dev Type



The growth of PHP applications continued to grow marginally over the past few years. This is the primary development skill set of the Web Services team. With the introduction of more Microsoft architecture (eg. NOS, Sharepoint, etc) there is an opportunity to see the emergence of other web development environment such as ".net". Additionally, BCIT's primary ERP Vendor (Sungard Higher Education) is beginning to roll out new RIA (Rich Internet Applications) functionality using the Adobe Flash/Flex environment. Sungard will also begin retrofitting their existing applications in this same RIA environment.

2.3.4.8) Web Traffic



Top Pages

Rank	2006/2007	2007/2008	2008/2009
1	http://www.bcit.ca/	http://www.bcit.ca/	http://www.bcit.ca/
2	http://www.bcit.ca/study/	http://www.bcit.ca/study/	http://www.bcit.ca/search/
3	http://www.bcit.ca/search/	http://www.bcit.ca/admission/	http://www.bcit.ca/study/
4	http://www.bcit.ca/admission/	http://www.bcit.ca/search/	http://www.bcit.ca/library/
5	http://www.bcit.ca/path/business/programs/	http://www.bcit.ca/path/business/programs/	http://www.bcit.ca/admission/
6	http://www.bcit.ca/path/trades/programs/	http://www.bcit.ca/path/trades/programs/	http://www.bcit.ca/path/health/programs/
7	http://www.bcit.ca/path/health/programs/	http://www.bcit.ca/path/health/programs/	http://www.bcit.ca/path/business/programs/
8	http://www.bcit.ca/path/engineering/programs/	http://www.bcit.ca/pts/	http://www.bcit.ca/pts/
9	http://www.bcit.ca/study/courses/	http://www.bcit.ca/path/engineering/programs/	http://www.bcit.ca/path/trades/programs/
10	http://www.bcit.ca/admission/fees/	http://www.bcit.ca/admission/fees/	http://www.bcit.ca/path/engineering/programs/

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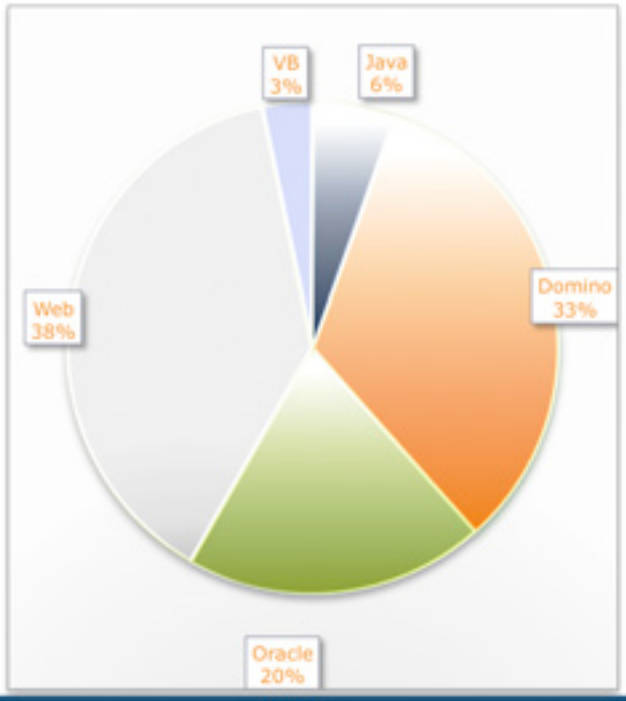
The data above shows that while the number of visits to the BCIT Web sites has remained fairly constant with just a slight softening in the most currently reported year, the number of Unique Visitors continues to increase marginally. One possible supposition that could be drawn from this data is that there are more individuals searching the Internet seeking information about post secondary opportunities. Additionally, while last year's relative drop from the previous year's average 'visit length' was reported as a likely outcome of a more efficient web site design, this year's average 'visit length' has increased significantly. This would require further analysis to determine of the visitors are having increased difficulty navigating the sites, or if there are more things to see and do and so individuals are more persistent in their visit.

2.3.4.9) IT Services Applications

Audience	Function	Application
IT Services	Application and Service Monitoring	Nagios
	DRP	Tivoli Storage Mgmt
	Imaging	Ghost
	Job Scheduling	Autosys
IT Services and Clients	Anti-spyware	MASE
	Anti-virus	Virus Scan Enterprise
	Application Updates	Novell Zenworks
	Desktop Protection	EPO
	Directory,File, Print	Novell eDirectory
	Secured Access	Nortel VPN
	Windows Update	WSUS
	Lab Security (software)	Deep Freeze
	License Provisioning	License Servers
	Application Provisioning	Citrix

The information above details the various application systems and utilities that are used by IT Services to manage and monitor its own environments and infrastructure. These tools and applications also require review and renewal as the underlying environments shift and change.

2.3.4.10) Application Development Environments



- Web = includes Linux, Apache, mySQL and PHP
- Oracle = includes Oracle Forms and PL/SQL
- Domino = Lotus Notes applications that are deployed as Windows and/or Web clients
- Java = combination of Oracle and Jboss Java applications
- VB = Visual Basic (primarily used for small, departmental applications)

The graphic above shows the proportionate share of the total application development environment for each of the primary technologies/applications in use at BCIT. Different application development environments provide various advantages and opportunities to deliver functions/features and meet client needs and expectations. With the implementation of the Solutions Council under the auspices of the Solutions Architect, application requests will be evaluated and matched against the optimal development environment going forward.

2.3.4.10) Application Development Environments – by Tech Mgmt

	Enterprise	Dept	Innovative	Total
Java	4	1		5
Domino	22	7	1	30
Oracle	15	3		18
Web	16	19	1	36
MS Access/VB	1	2		3
Total	58	32	2	92

NB: There are a number of "applications" or "utilities" which do not require development on our behalf and, therefore, are not included in this chart. For this reason, the total is 92 applications, instead of the full portfolio of 146.

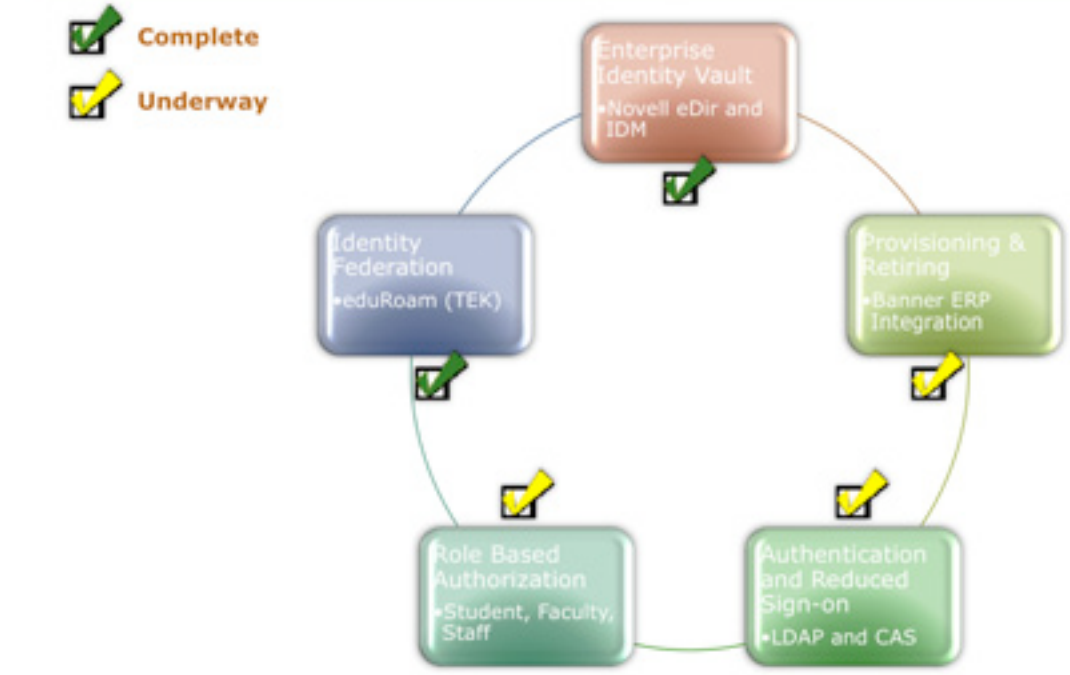
This breaks down the application portfolio by support category (Enterprise, Departmental, Innovative) and delineates the number of application in each of the development environments within that support model. With IT Services focus on centralized computing ("Enterprise"), it is clear that the majority of applications, and therefore the majority of support requirements are in the Oracle and then the LAMP development environments.

2.3.5) MIDDLEWARE

- 2.3.5.1 - Identity Management
- 2.3.5.2 - Portals
- 2.3.5.3 - Web
- 2.3.5.4 - App, DBMS Server
- 2.3.5.5 - Enterprise Application Integration (EAI)

The following section describes the attributes and current state of a number of 'middleware' components that enable and support our overall IT environment at BCIT.

2.3.5.1) Identity Management



Identity Management (IDM) as an initiative can be broken down into the 5 major areas represented on the slide above. Of the three boxes above that are still underway:

• Provisioning & Retiring: This is larger business process bound. The IDM team are working with the business areas, in particular the R/O for students and HR for faculty and staff to put the appropriate triggers in place that are based on business rules to trigger the creation, change, or retirement of ID's based on business activities (eg. Admitting a new student, hiring a new faculty member, departure of a staff member etc).

• Authentication and Reduced Sign on: The IDM team continue to look for improvements in single sign on opportunities that still meet the rigor of an appropriate set of security controls.

• Role based authorization: This will become much more feasible with the pending and future releases of Banner and Oracle.

Generally, the IDM team have made significant progress to date (see next slide), including the implementation of Identity Federation (EduRoam) that allows visiting staff, faculty and students from other EduRoam participating institutions to connect to our wireless network using their own home institution credentials. It also allows our faculty, staff and students to connect to the other participating EduRoam institutions using our BCIT credentials.

2.3.5.1) Identity Management

Technology	IDM	Status	Due Date	Complete
Wireless Network Authentication	AuthN	Done	Oct 2007	Oct 2007
iTunes University (TEK)	AuthN/AuthZ	Done	Oct 2007	Oct 2007
Student Residence ISP	AuthN	Done	May 2007	May 2007
Incident Monitor	AuthN	Done	Aug 2007	Aug 2007
CAS – SoB Web Download	AuthN	Done	Sep 2007	Sep 2007
CAS – SoB Timetabling Site	AuthN	Done	Sep 2008	Sep 2008
Eduroam – wireless roaming	AuthN	Done	Apr 2008	Apr 2008
NOS Identity Provisioning	AuthN/AuthZ	Underway	Oct 2008	Nov 2009
CAS – AuthN for web pages	AuthN	Ongoing	N/A	N/A

AuthN = Authentication: ID & Password required to access technology services
AuthZ = Authorization: Recognition of role based authority to specific technology functions

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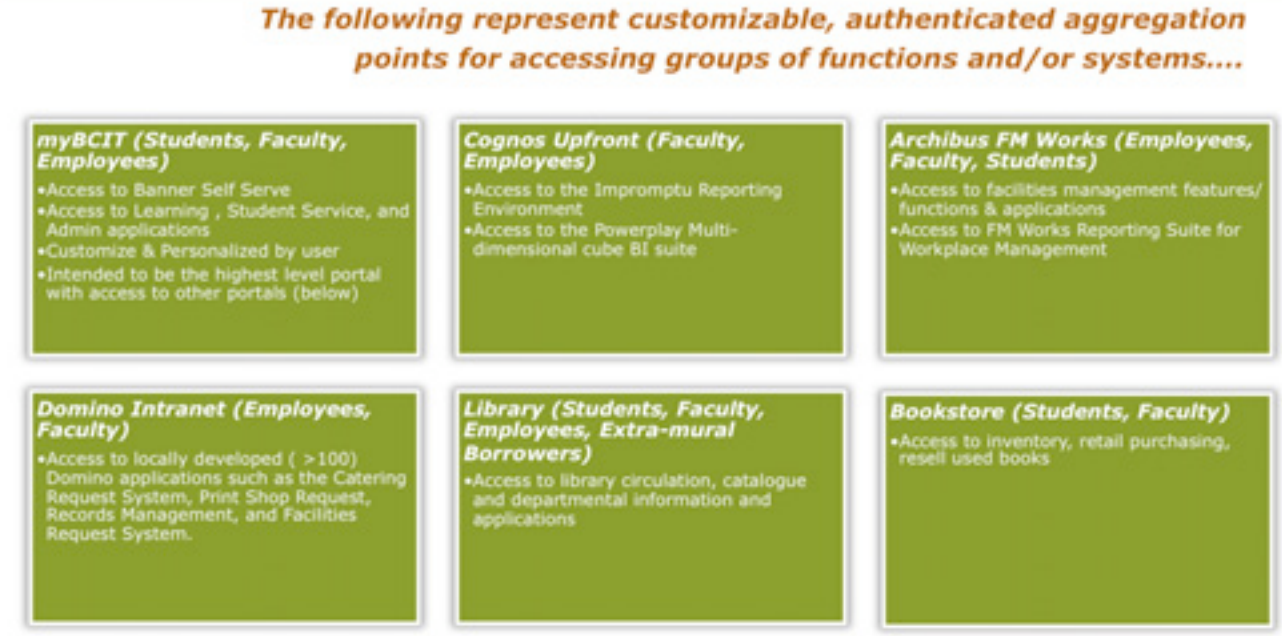
TECHNOLOGY CHANGES EVERYTHING

This shows the current state and progress for the specific initiatives that are underway in the Identity Management Portfolio of projects.



The slide above represents the 6 major user interfaces that are commonly thought of, or conform to the general description of a 'portal'. Within each of the 6 boxes, the name of the service is listed, with the constituents who would typically use these user interfaces listed in brackets immediately following the name. Another representation of this data would look like:

	Constituent	User Interface (Portal)
	~~	~~~~~~~~~~~~~~~~~~~~~~~~
1)	Students	- myBCIT
		- Archibus
		- Library
		- Bookstore
2)	Faculty	- myBCIT
		- Cognos
		- Archibus
		- Domino
		- Library
		- Bookstore
3)	Employees	- myBCIT
		- Cognos
		- Archibus
		- Domino
		- Library
4)	Extra-mural	- Library

2.3.5.3) Web Server

Distribution of Use of each Web Server Technology

Technology	Sandbox	Devel	Test	Prod	QA	DRP
Apache	2	4	5	12	1	1
IIS	1	1	0	1	0	0
Sun	2	1	0	1	0	0

Currency of each Web Server Technology

Technology	Year Installed	Year Last Upgraded	Current BCIT Release	Release in Marketplace	Releases behind Market
Apache	1994	2009	2.2.11	2.2.11	n/a
MS IIS	2005	2008	7.0	7.0	n/a
Sun	2004	2005	3	4	1 version

IT Services makes a concerted effort to keep the software that we deploy on behalf of our clients at a current and supported level. This is evidenced above by the fact that the systems listed are all within 1 release or less to the most current in the marketplace.

2.3.5.4) Application Server

	Sandbox	Devel	Test	Prod	QA	DRP
OAS	1	3	1	3	1	2
BEA	1	1	0	1	0	0
JBOSS	0	1	1	1	0	0
Domino	1	0	1	1	0	1

Technology	Year Installed	Year Last Upgraded	Current BCIT Release	Release in Marketplace	Releases behind Market
Oracle App Server	2001	2007	10.1.2	10.1.3	1 version
BEA	2006	2006			
JBOSS	2006	2006			
Domino	2001	2008	8.5	8.5	n/a

Similar to the previous page, this page provides the same information for Application Servers.

2.3.5.4) DBMS Server

	Sandbox	Devel	Test	Prod	QA	DRP
Oracle	1	3	1	3	1	0
SQLServer	1	1	0	1	0	0
Domino	0	1	1	1	0	1
Postgres	0	0	0	1	0	0
mySQL	1	0	0	1	0	0

Technology	Year Installed	Year Last Upgraded	Current BCIT Release	Release in Marketplace	Releases behind Market
Oracle DBMS	1992	2008	10.2.0.3	11g	1 version
SQLServer	2004	2008	2008	2008	n/a
mySQL	2004	2007	5.0.45	5.0.77	n/a *
Postgres	2006	2008	8.1.11	8.1.17	0.0.6 versions
Domino	2001	2008	7	8	1 versions

Similar to the previous two pages, this page provides the same information for Database Servers.

* While we are technically behind market release with mySQL, we must use 5.0.45 as long as it is platformed on Red Hat Enterprise 5 as it is a prerequisite for that Operating System.

2.3.5.5) Enterprise Application Integration

Source of Data	Destination of Data	Type of data flow	Frequency
Banner	Raisers Edge	One way Batch	Semi-Annual
Ministry	Financial Aid	One way Batch	Daily
Banner	Financial Aid	Two way Integration	Realtime
Banner	Mamook (Learner Services)	One way Batch	Weekly
Banner	Library	One way Batch	Weekly
Banner	ITA	One way Batch	Monthly
Banner	IDM	1 way Integration Software	Real Time
Ministry High School	Banner	One way Batch	Ad Hoc
Banner	Training Plan (Vocational Inventory)	One way Batch	Daily
Banner	Webfiles	One way Batch	Daily
Banner	MyBCIT	1 Way Integration software	Real Time
Banner	WebCT	1 Way Integration software	Real Time
Banner	AP cheque production	One way Batch	Weekly
Banner	One Card (Security)	One way Batch	Daily
Banner	Student Novell provisioning	One way Batch	Real Time
Banner	Bank Reconciliation	One way Batch	Monthly

This page and the following page represent the integration or 'flow' of data and applications across the application portfolio managed and maintained by IT Services. In most cases, these are considered "point-to-point" integrations where the sending program needs to know and fully comply with the receiving program's requirements for incoming data. This can lead to many combinations of unique interfaces between the participating applications. A more effective way to architect this is to use a piece of 'middleware" that acts as a traffic controller and translator. That is considered more of a "hub-and-spoke" architecture where the middleware acts as the hub, with a single spoke between it and each of the application systems. Application systems that need to share information with other applications 'publish' that data to the hub. The hub then listens for other applications that are 'subscribed' to receive data. The Hub (middleware) does all the translation and transformation before releasing the data to the subscribing application. This simplifies the integration environment so that each application only needs to know how to publish once (not once for each application program requiring data from it), and declares its subscription requirements (incoming data) once to the Hub. This continues to be a direction IT Services is evaluating and researching.

2.3.5.5) Enterprise Application Integration
(continued)

Source of Data	Destination of Data	Type of data flow	Frequency
Banner	Scotia Bank - Direct deposit	One way Batch	Weekly
Banner	Ministry Data Warehouse	One way Batch	Semi-Annual
Banner	Canada Revenue Agency	One way Batch	Annual
Banner	Archibus	One way Batch	Daily
Banner	Incident Monitor	One way Batch	Daily
Banner	Program & Course Finder	One way Batch	Daily
Banner	Parking	One way Batch	Daily
Banner	Safety and Security	One way Batch	Daily
Banner	Central Stores	One way Batch	Daily

Current integration architecture is primarily "point to point" application program interfaces (API's)

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2.3.6) INFRASTRUCTURE

- 2.3.6.1 - Aged Replacement Value
- 2.3.6.2 - Desktops / End Devices
- 2.3.6.3 - Network
- 2.3.6.4 - Servers
- 2.3.6.5 - Storage
- 2.3.6.6 - Physical Facilities

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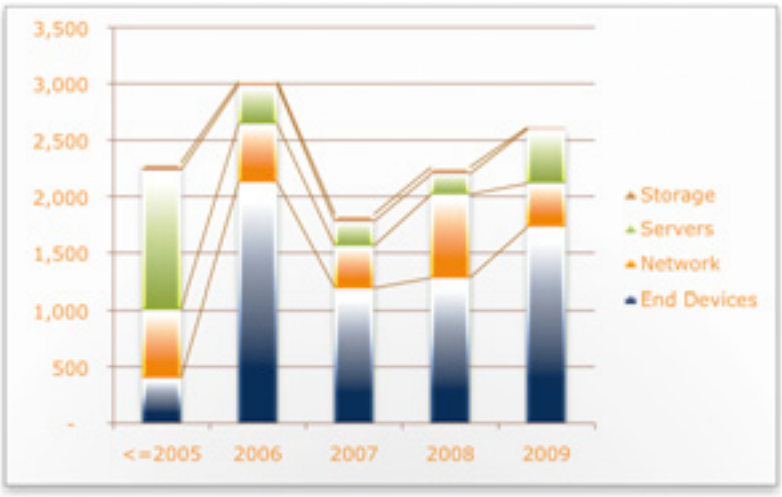
2.3.6.1) Age and Profile of Infrastructure



- The chart shows the estimated replacement cost (in '000's') of equipment by year of installation
- The first bar represents equipment installed in 2005 or earlier
- A total of $9.5M of equipment is represented by the chart – note physical facilities such as machine room space, power supplies and cabling plant are not included
- Approximately $2M of network and server equipment was installed in 2005 or before
- Much of the increase in 2008 is due to ATC equipment installations
- Much of the increase in 2009 is due to NOS and Citrix projects

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TECHNOLOGY CHANGES EVERYTHING

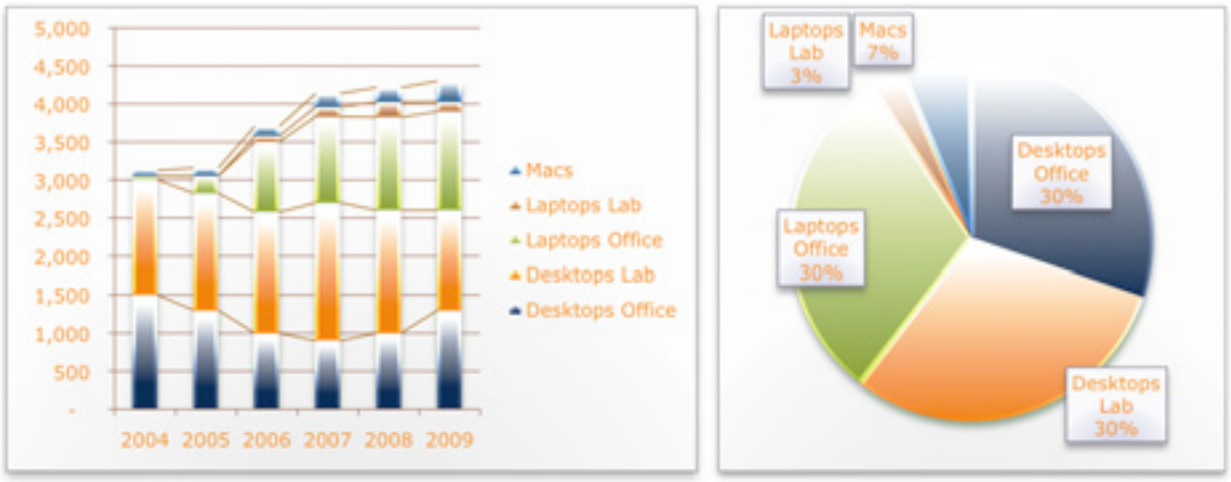
The estimated replacement cost for all of the active, centrally supported IT infrastructure is approximately $12Million. IT Services has been focused on identifying equipment and infrastructure that is reaching, or has surpassed its expected useful life, and requests Capital for replacement of this equipment annually. The useful life of different components of infrastructure varies from 3 to 4 years (computers, network switches, etc) to as much as 10 years (fibre optic and network cabling, etc). Failure to replace and renew IT infrastructure can put the Institute's IT assets at serious risk of failure and/or loss. Additionally, renewing on regular basis allows the Institute to take advantage of constantly improving price/performance curves.

As of 2009, the following Capital requests have been identified as required to adequately renew infrastructure over the coming 5 years:

- 2010 : $4,394,000
- 2011 : $4,574,000
- 2012 : $3,352,000
- 2013 : $2,642,000
- 2014 : $3,140,000

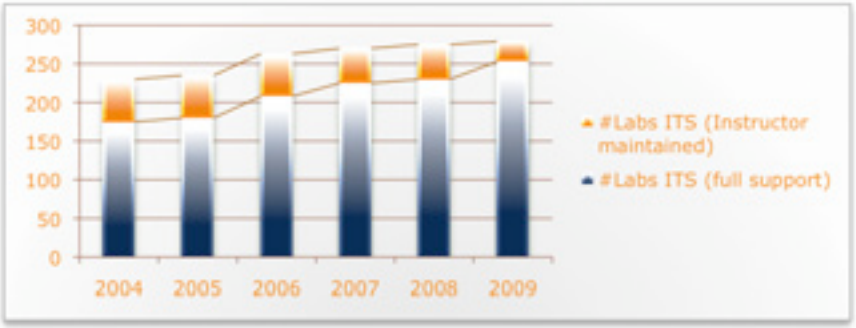
5 Year Total: $18,085,000

2.3.6.2) End User Devices – Desktops and Laptops

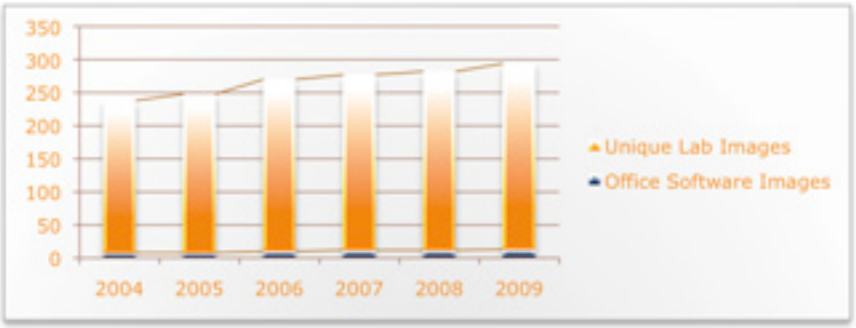


The charts above identify the estimated growth and distribution of computing end devices deployed across the organization. This is based on a variety of sources of information and still lacks some veracity. IT Services has started an initiative to centrally record and report this inventory information going forward. This will include defined snapshot dates to ensure consistency of data reporting. It will also include definitions of when end devices are officially recorded into our books, as well as a more robust and consistent process for removing assets from our books as they are taken out of service during their natural ever-greening replacement cycles.

2.3.6.2) End User Devices – Labs and Software Images



- Fully supported labs have grown at a CAGR of 8% while instructor supported labs have declined at 14%
- Chart does not include labs not involving ITS (e.g. Cisco labs)



- Labs images have grown at 10% primarily due to unique software combinations
- Office images have grown primarily due to laptop hardware configurations

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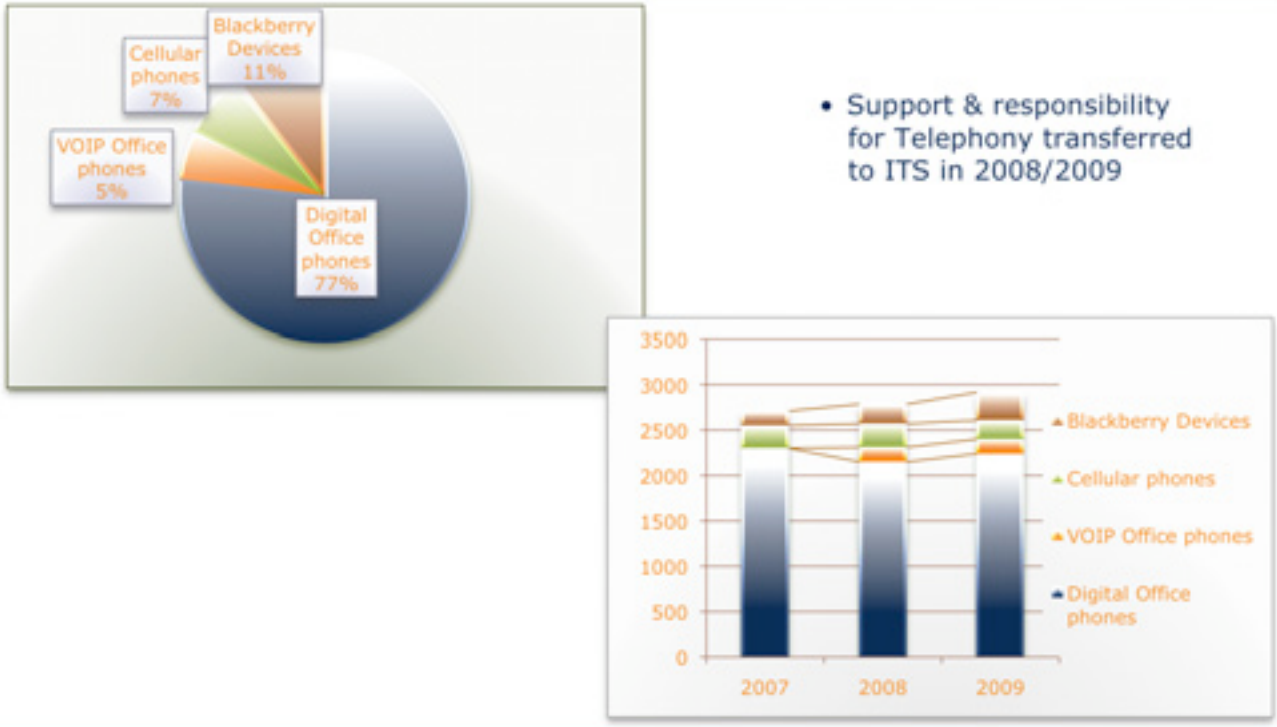
TECHNOLOGY CHANGES EVERYTHING

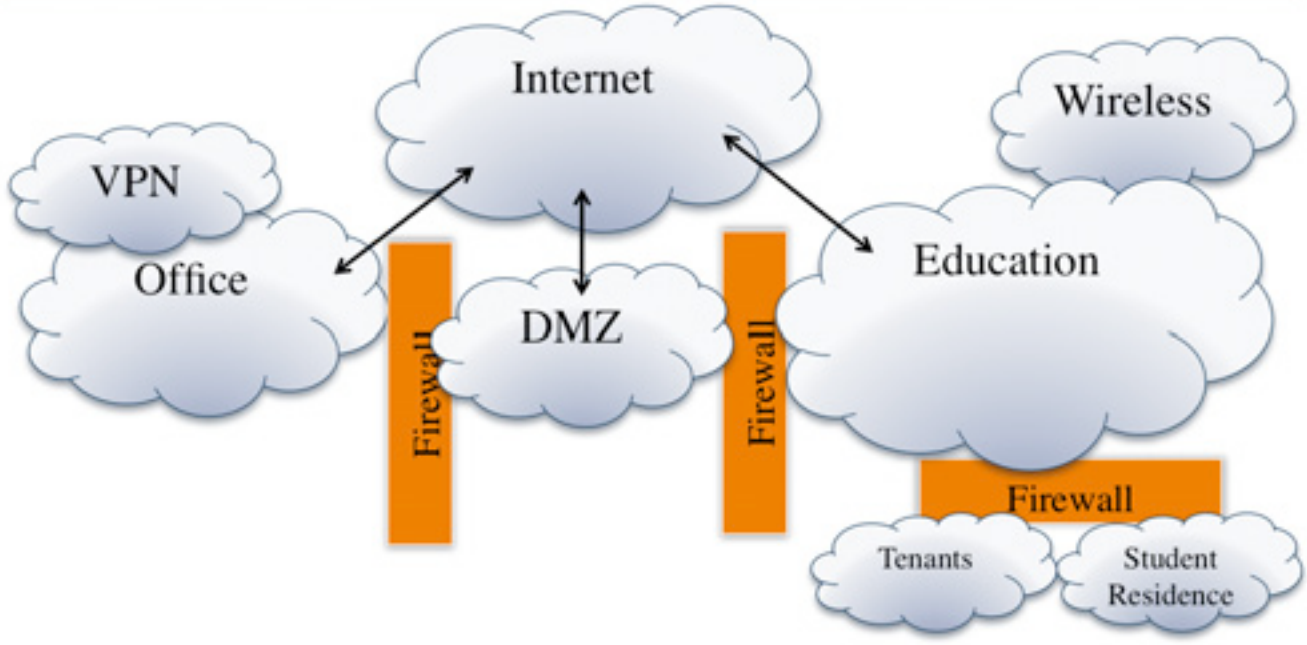
The decline in Instructor supported labs over the reporting period can largely be accounted for by a concerted 'repatriation' initiative undertaken by IT Services to offer to centrally support and provide standards based hardware and software to the teaching areas that had been responsible for their own lab equipment and software. There are still a number of independent labs across the Institute that have a unique requirement for a 'deviation from standard'. IT Services will continue to look for opportunities to repatriate additional independent labs provided the level of service expected by the faculty can be met or exceeded while conforming to standards supported by IT Services.

2.3.6.2) End User Devices – Telephony



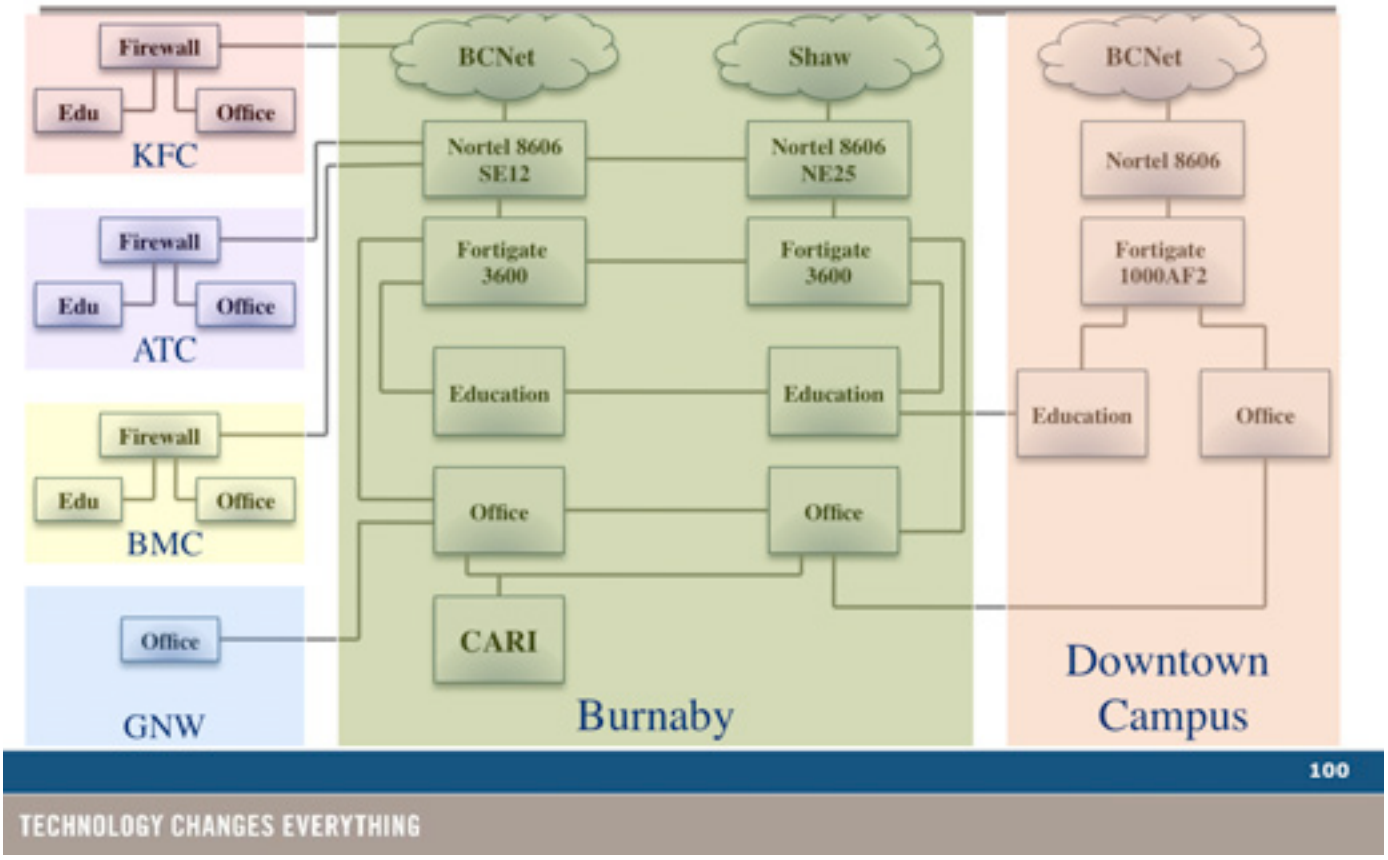
Telecommunications was transferred to IT Services in the 2008/2009 fiscal year. As a result, IT Services only has data beginning just prior to that time. The data above does not distinguish between standard desktop "office phones" and "VOIP" phones. In 2009, there were 2,230 non-VOIP phones, and only 160 VOIP phones. Over the coming years, it is expected that this distribution will start to shift to more VOIP phones and fewer non-VOIP phones. VOIP technology was first put in place at the new ATC Campus, and will soon be implemented in the CARI buildings.

2.3.6.3) Network – Logical Architecture



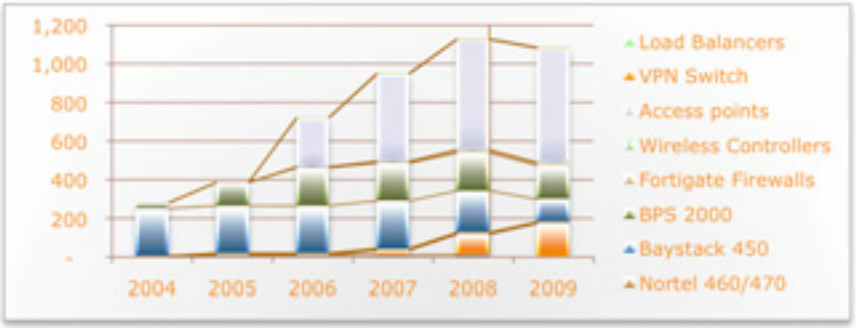
BCIT's network architecture divides our private network into 2 physically separate segments. One for Academic use, and one for Administrative use. Additionally, these segments have a variety of security 'zones' that function to protect and secure services and infrastructure as required.

2.3.6.3) Network – Conceptual Map - Physical Architecture

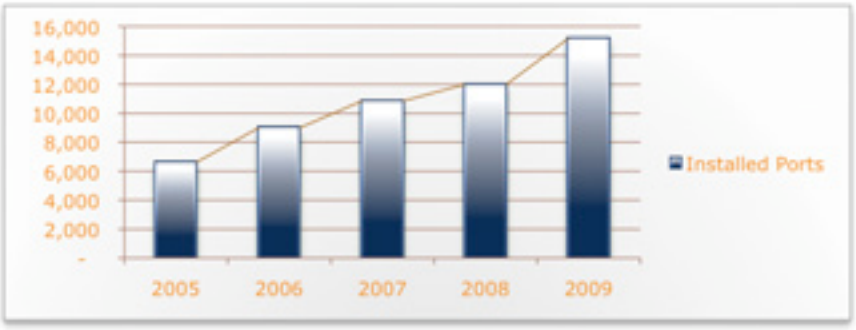


The connectivity within a geographic site, and between sites is represented above. It is designed to provide enough redundancy to allow for partial network failure without completely crippling the organization. An example of this can be seen in the architectural design of the Burnaby campus. There is redundancy and multi-pathing between the core Nortel 8606 switches, between the Academic and Administrative segments (over to the DTC campus), and there are redundant pathways to the Internet (BCNet and Shaw).

2.3.6.3) Network Equipment



- Graph shows a count of network devices
- Reduction in units in 2009 are due to replacement of 24-port switches with 48-port switches



- Graphs shows the number of ports on the wired network
- Network ports have grown at a CAGR of 15%
- Over the same period:
  - Wireless introduced
  - Firewalls and VPN devices introduced

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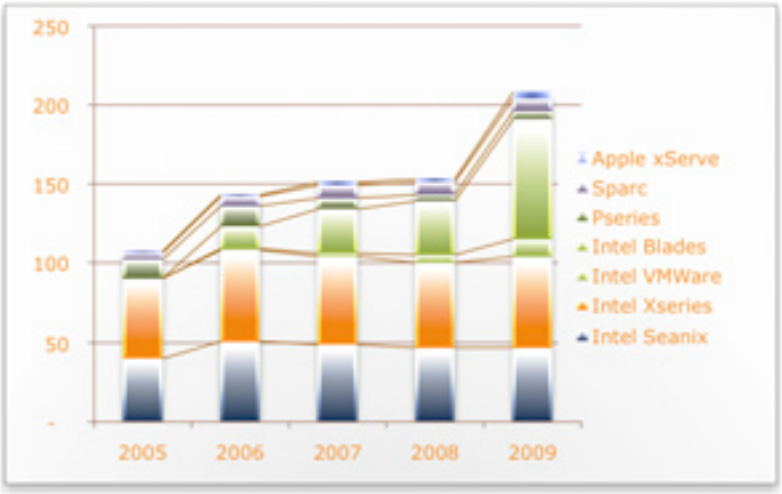
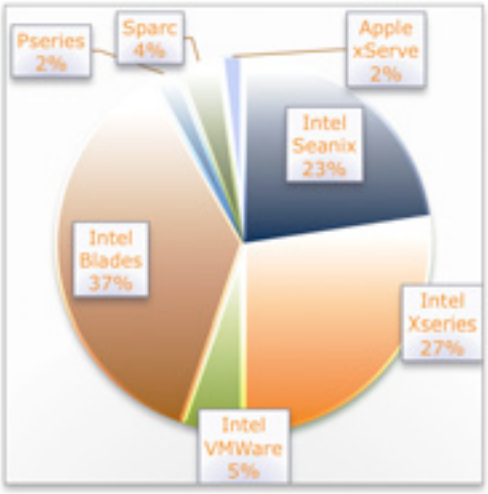
As with other areas of infrastructure managed by IT Services, opportunities for consolidation and economies of scale are always reviewed and evaluated. Replacing 24 port switches with more robust 48 port switches is one example of this.

2.3.6.4) Servers

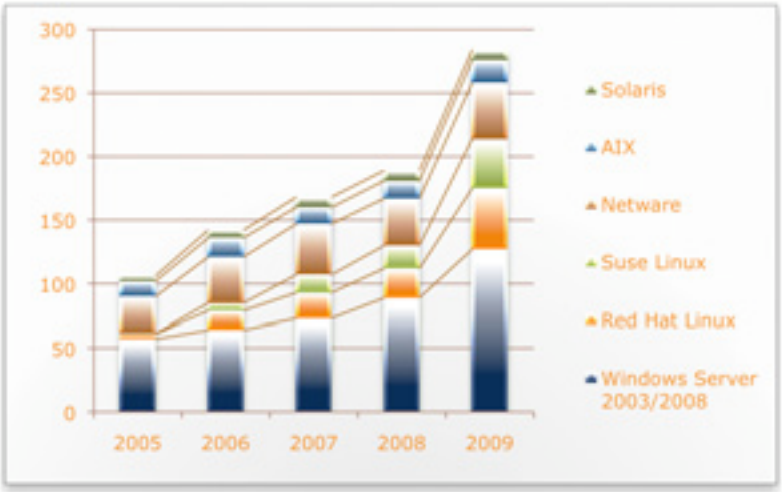


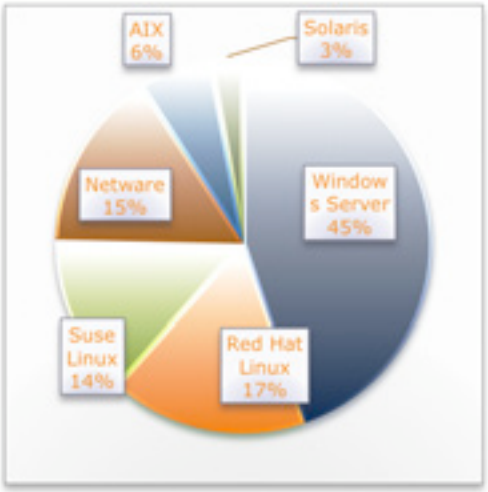


- Server growth in 2009 is in Blade & VMware servers, largely for NOS and Citrix projects
- Overall server growth is flat from 2007 to 2008 due to the impact of virtualization strategies
- Blade and VMware servers have grown at a CAGR of 80% since 2006

There has been a significant growth in the deployment of virtualized servers over the past year. This has helped IT Services meet its mandate for improved energy efficiency and contributions to the Institute's "Green Initiatives" as well as allows for a more agile deployment environment where new servers can be deployed sometimes in hours as opposed to weeks.

2.3.6.4) Operating System Instances





- The graph shows the number of instances of various operating systems (OS) by year
- Windows Server represents 45% of instances versus 15% for Netware
- While AIX instances represent a small proportion of instances, BCIT's most mission critical systems run on this OS
- The two variants of Linux have grown at a CAGR of 40% since 2006

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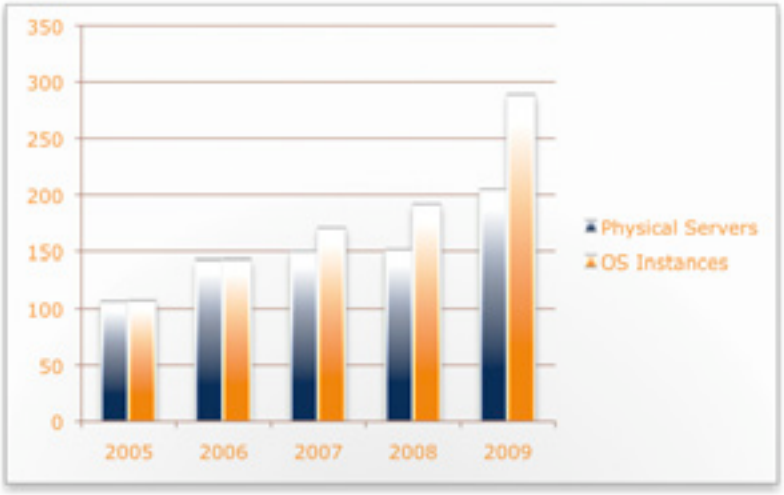
TECHNOLOGY CHANGES EVERYTHING

The graphic above describes an increasing trend line in the overall number of "operating system" instances over the past 5 years. These could 'roughly' be equated to the increase in the number of servers IT Services has implemented and supports. More recently (2008/2009), IT Services has started to deploy virtual servers in earnest. The result is that the number of physical server devices within IT Services is lower than the number of "operating system instances".

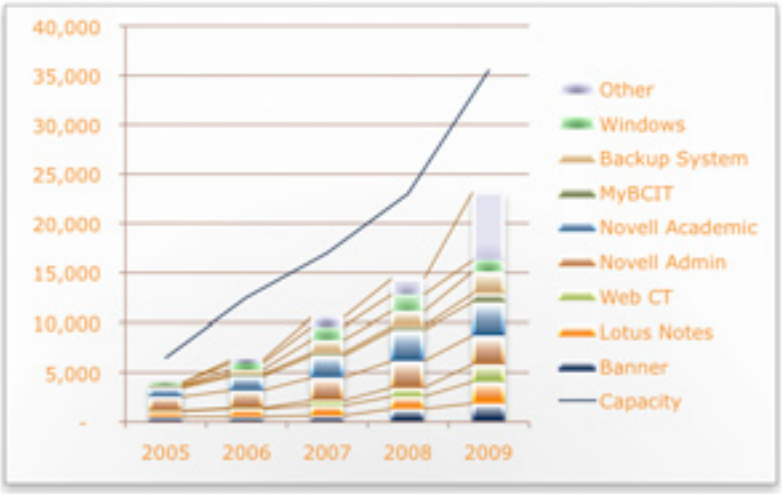
2.3.6.4) Operating System Instances relative to Servers



- Virtualization has had an impact
- The number of physical servers did not grown significantly from 2007 to 2008
- The growth in physical servers from 2008 to 2009 is dues to NOS and Citrix projects

The information above best illustrates the shifting relationship of Operating Instances to Physical Servers as the result of the availability and deployment of virtualized servers over the past 3 years.

2.3.6.5) Storage



- The graph shows gigabytes of data allocated on the ITS Storage Area Network in each year
- Data storage is growing at a compound annual rate of 56%
- "Other" has grown to consist of VMWare, misc AIX, non-VMWare Linux, Citrix and Web, and should likely be subdivided in future reports.

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Data storage is the single fastest growing IT commodity here at BCIT and generally in industry. The price performance curve for data storage is improving, though not quite as fast as the cumulative growth rate. The other consideration is that all storage that is deployed and consumed needs to be treated and considered just as any other IT Infrastructure with respect to defined useful life expectancy, and the related need to budge capital funds for annualized replacement and renewal.

2.3.7) Physical Facilities

- 2.3.7.1 - Machine Room
- 2.3.7.2 - Network Closets
- 2.3.7.3 - Cabling Plant
- 2.3.7.4 - Office Space

The following section briefly describes the physical facilities used and managed by IT Services.

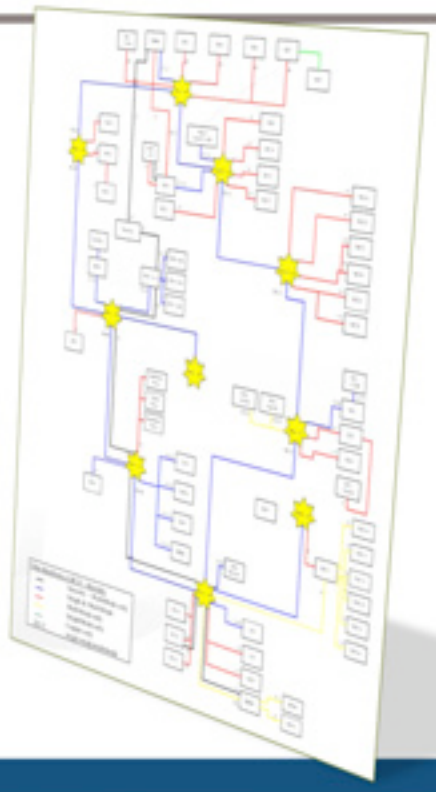
2.3.7.1) Machine Room Floor Space & Usage

Room	Purpose	Square footage	Air conditioners	Secure access	UPS	Fire - Smoke detection	Fire suppression
SE12	Main Data Center	1260	Yes (2)	Swipe card	Yes	Yes	Pre-action Water
NE25	BBY/DTC Network Hub	250	Yes	Keys	No	Yes	No (fire alarm)
DTC	Backup Data Center	280	Yes	Swipe card	In progress	Yes	Sprinkler
ATC	Network room	450	Yes	Keys	Yes	Yes	Sprinkler
CARI	2nd Backup Data Center (Nov 2008)	95	To be included in design	To be included in design	To be included in design	To be included in design	To be included in design

IT Services currently has dedicated facility space at 5 locations across the multiple campuses of BCIT. The spaces at the Burnaby SE12 facility and the NE25 facility are aging and will require attention in the near future to ensure they are still adequate from a power, connectivity, air conditioning, security access, and physical space perspective.

Network Closets

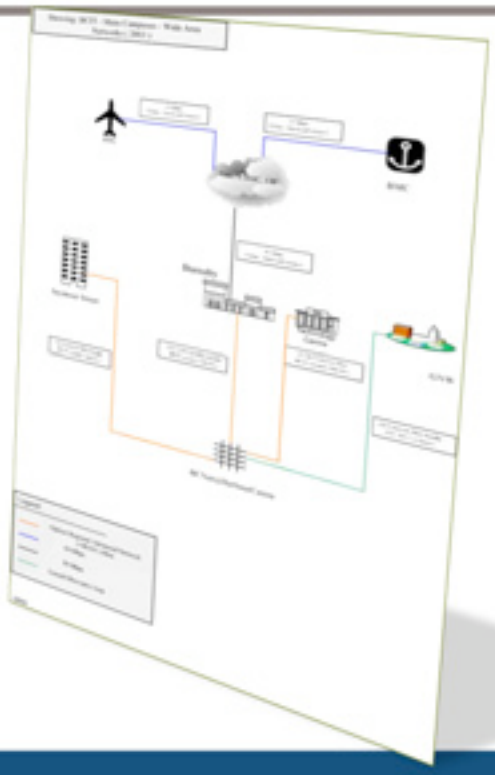
Campus	Closets
Burnaby	101
DTC	11
BMC	3
ATC	9
GNW	2
CARI	2 (9 max)



IT Services currently manages over 130 network closets across our campuses as distribution points to bring connectivity to offices, labs, and wireless access points.

Cabling Plant

- More than 400 kilometers of copper cable.
- More than 380 kilometers of fiber optic cable.



The physical Network cabling itself that carries the data and information across all of our campuses represents over 750km's of wire and optic fibre. This does not include cabling to standard (non-VOIP) telephony end devices.

IT Services Office Space

	Burnaby	DTC	New ATC	BMC	GNW	CARI
Office	16	1	1 with 2 cubicles	1	0	0
Work stations	83	7				
Meeting Rooms	2	1 (shared)				
Service Desks	1					
Service Counters	1	1	1			
Storage/staging facilities	3	1 bench room				

The natural growth of the department over the past decade, along with many new functional and technical core services ITS is now responsible for have led to a rather poor physical environment that is conducive to maximum collaboration and team work across multiple inter-related groups within IT Services. This needs to be a focus area for ITS and the Institute as new opportunities present themselves for space reconfiguration.

INFORMATION TECHNOLOGY SERVICES

Information Technology Plan for BCIT – Year 3 (2009/2010) Addendum

Section 3:
Year 3 (2009/2010) Environmental Scans

BCIT

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TECHNOLOGY CHANGES EVERYTHING

Table of Contents – Section 3 "Environmental Scans"

This section will deal with the 5 specific areas of Environmental Scan. It will present the Executive Highlights first. These summarize the details and findings that are included in the next section. The intent is to gather enough topical, relevant, and current information about each of these areas to be able to reflect to the reader the general state of each of these areas.

3.1) Introduction

- 3.1.1 - Plan Framework
- 3.2.1 - Rationale

Introduction:

Plan Framework: Where are we in the Strategic Planning process

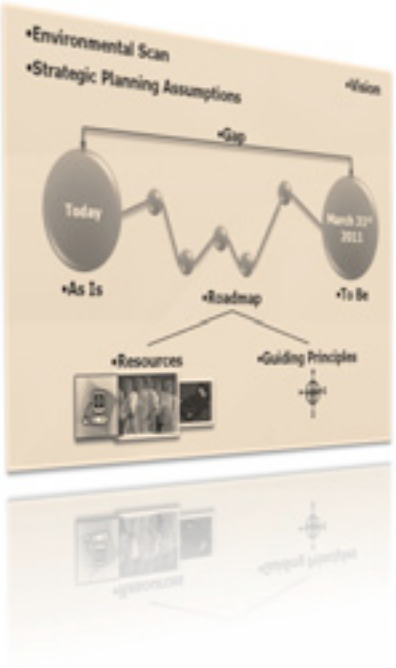
Rationale: What is the value of doing Environmental Scans

3.1.1) Plan Framework

Environmental Scan:

This is a look out into society, Higher Education as a vertical industry, and Information Technology to identify the major trends that are happening and influencing each of these areas. This also includes a high level assessment of what the impact of each identified trend will have on BCIT.

3.2.1) Rationale



- Why the Environmental Scan?
  - Provides context for the plan
  - Opportunity to compare and contrast ourselves with higher education and information technology trends
  - Broad perspective on factors that affect and influence IT Plans and IT's ability to add value to the organization

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TECHNOLOGY CHANGES EVERYTHING

By conducting environmental scans of selected areas of technology and other IT processes and functions, it give us the opportunity to assess BCIT's readiness and maturity in each of these areas so that we are as well prepared as possible to leverage these features, and as importantly, avoid missing an opportunity or facing unnecessary risks. This keeps the IT department current in terms of industry trends and thinking in these major areas of focus.

3.2) Executive Highlights Environmental Scans

- 3.2.1 – Cloud Computing
- 3.2.2 – Evolution and Impact of Mobile Devices
- 3.2.3 – Sustainable Technology
- 3.2.4 – Technology Trends in Higher Education
- 3.2.5 – Virtual Communities

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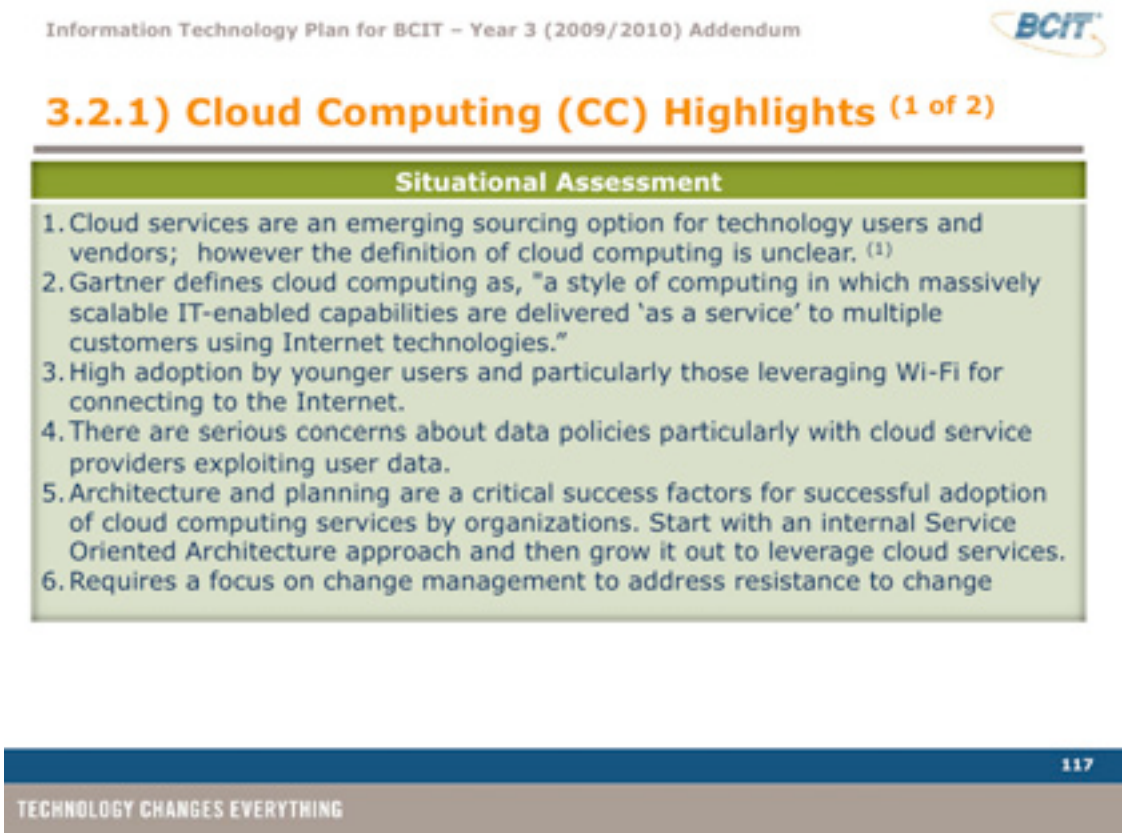
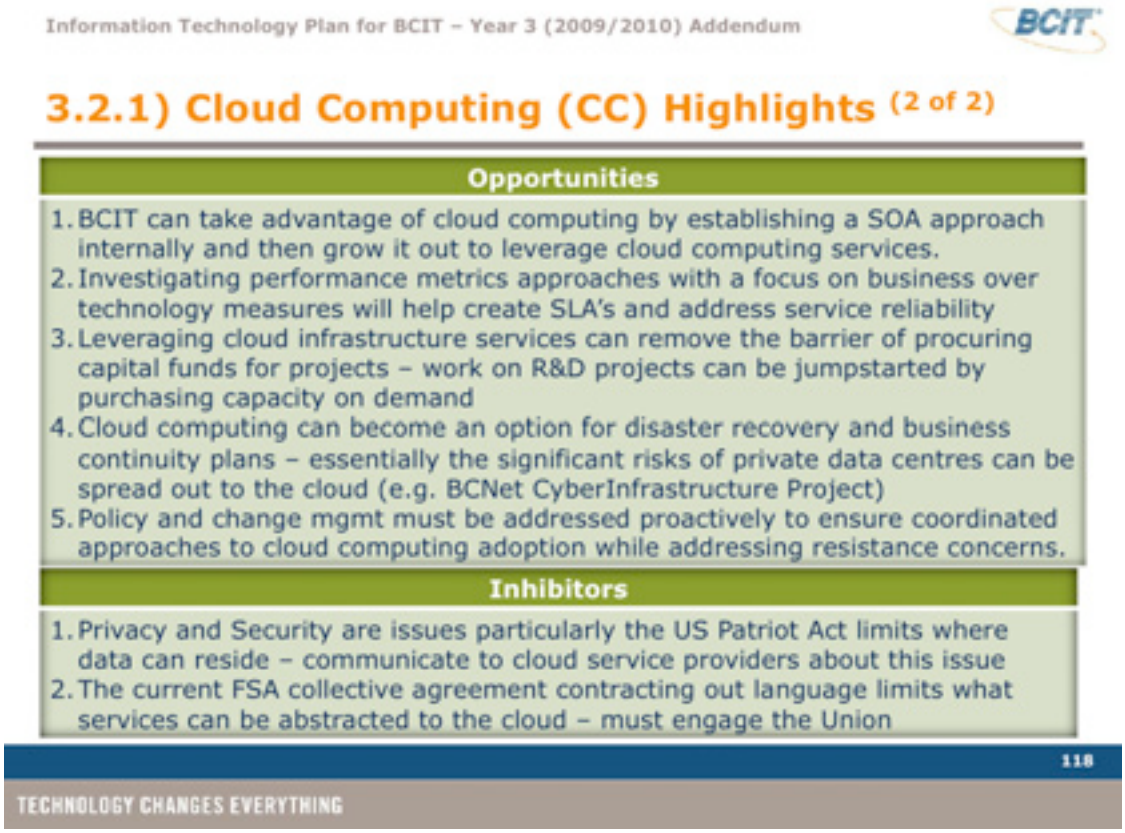


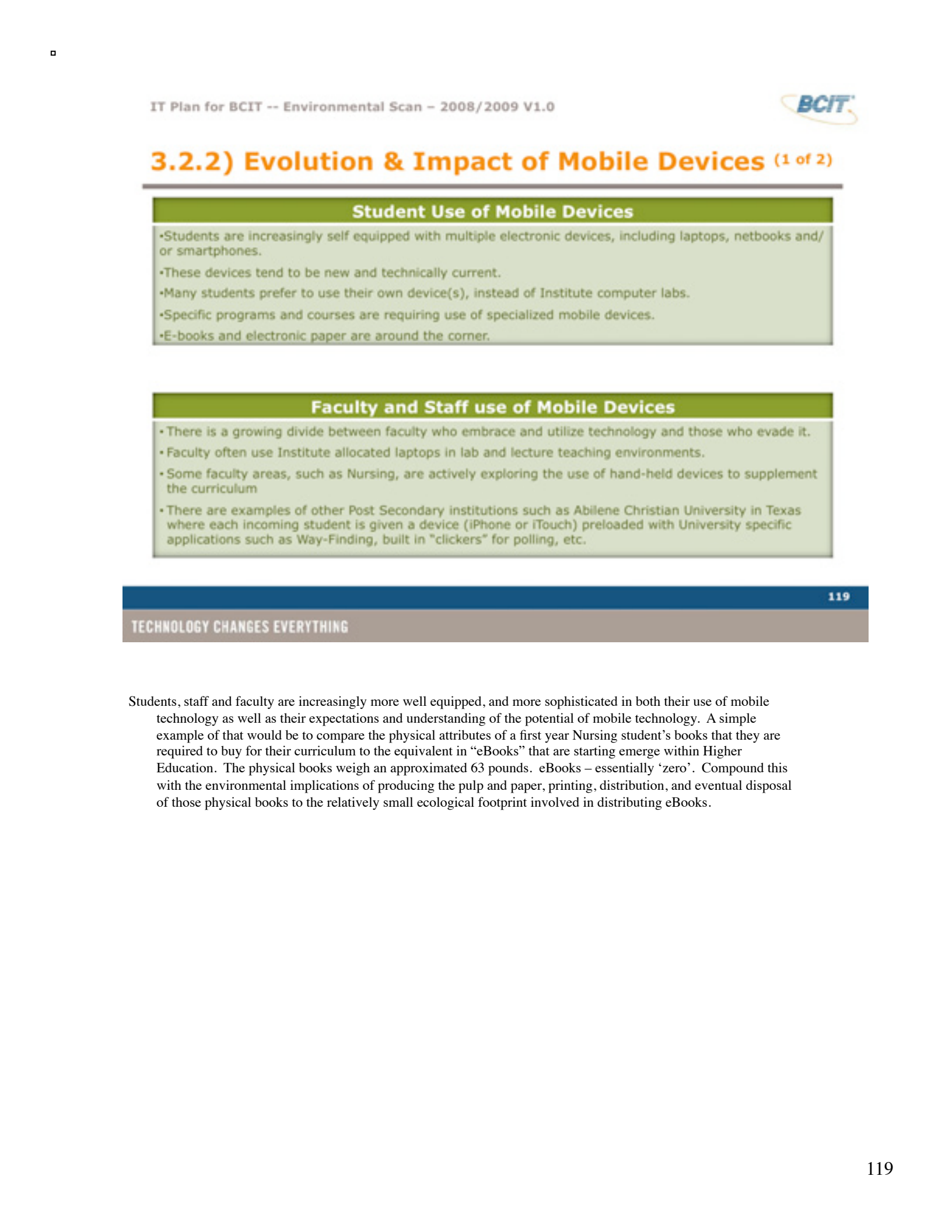
The term "Cloud Computing" was first introduced early in the 21st Century. The underlying concept dates back to 1960 when John McCarthy opined that "computation may someday be organized as a public utility"; indeed it shares characteristics with service bureaus which date back to the 1960s. The term *cloud* had already come into commercial use in the early 1990s to refer to large ATM networks. By the turn of the 21st century, the term "cloud computing" had started to appear, although most of the focus at this time was on Software as a Service (SaaS). [Wikipedia]

Situational Assessment
- The six factors on the slide describe the current situational analysis of Cloud Computing.

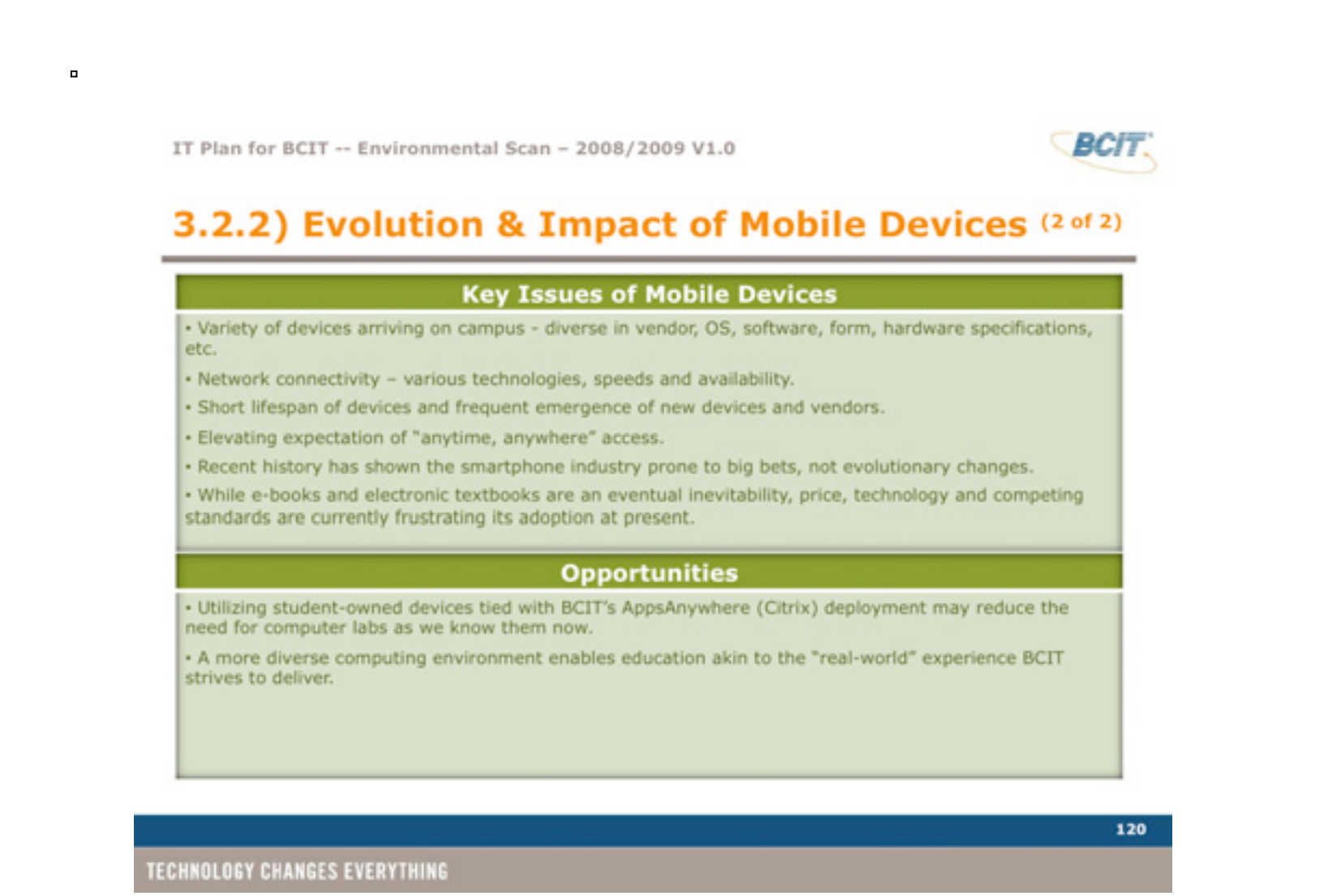


Opportunities
The 5 opportunities on the slide describe areas BCIT can leverage to begin investments in cloud computing architectures. The opportunities require investments in our staff to understand new architecture styles like Service Oriented Architecture and Service Performance Management. The opportunities have the potential to address cost efficiencies/savings as well as providing a disaster recovery and business continuity options. There is significant work on policy development and change management.

Inhibitors
Privacy and security continue to be significant inhibitors. The US Patriot Act severely limits where Canadian personal data can be stored. Until other options can be created by non-US companies, there may continue to be limits on how BCIT leverages cloud computing. The current FSA collective agreement's contracting out language will also be a limiting factor. BCIT leadership will need to work closely with our union partners to ensure that services can be delivered without risking job loss. Focusing on repurposing jobs to higher value services should be the goal.



Students, staff and faculty are increasingly more well equipped, and more sophisticated in both their use of mobile technology as well as their expectations and understanding of the potential of mobile technology. A simple example of that would be to compare the physical attributes of a first year Nursing student's books that they are required to buy for their curriculum to the equivalent in "eBooks" that are starting emerge within Higher Education. The physical books weigh an approximated 63 pounds. eBooks – essentially 'zero'. Compound this with the environmental implications of producing the pulp and paper, printing, distribution, and eventual disposal of those physical books to the relatively small ecological footprint involved in distributing eBooks.



The opportunity to leverage student, and eventually faculty and staff owned devices can realize a sizeable reduction in the need to provision and keep current end devices for teaching, learning, research, and even doing the business of BCIT.

3.2.3) Sustainable Technology - Highlights

Current Situation and Issues

- Information Technology is typically the 3rd largest consumer of energy in a commercial organization.
- Currently, there are in excess of 2Million Internet Searches per day. The energy that takes is equal to the energy consumed by Las Vegas Nevada, on a summer day.
- Unwanted electronics amount to approximately 2.2million tons of waster a year.
- Canada consumes on average 11.3kWatts per capita per year. The world average is 2.3kWatts.
- There are large social experiments initiated within Higher Ed (eg. "World Peace in 30 years") are attracting broad attention.
- Sustainability needs to be considered in broad IT terms to include things like HVAC needs, paper consumption (printing), embodied energy in IT component manufacturing, opportunities to use technology to avoid travel, packaging, etc etc.

Opportunities

- Include and enforce Environmental Stewardship standards (eg. ECP, EPEAT) in procurement activities to ensure BCIT is deploying energy efficient technology.
- Continuing to exploit the virtualization of servers as opposed to discrete physical servers.
- Look for opportunities to change behaviors, such as making duplex printing the default on all Multi Function and Printing Devices.
- Facilitate and grow enhanced video conferencing capabilities to avoid travel whenever possible.
- As local "subject matter experts" look to the School of Construction and the Environment for pragmatic programs for sustainability and environmental stewardship.
- Make Environmental Stewardship part of all Performance Goals and Objectives for excluded staff at BCIT.

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There are compelling and equally important social and political drivers for improving the environmental impacts of information technology at BCIT – as well as globally.

There has been a significantly increased social awareness of the carbon footprint that we as an organization leave on this planet. Additionally – BCIT has been challenged by the Provincial Government to become carbon neutral on a very short time horizon. Focusing on opportunities and essential cultural changes now is critical to achieving our goals as an institution, and as individuals.

3.2.5) Virtual Communities Highlights

Situational Assessment	

Virtual Communities range in complexity from a simple discussion forum to immersive 3D virtual worlds with their own economies. Online communities are increasingly centred around social networking sites, or social media, which are enabled by Web 2.0 technologies.
 	
Each online community develops its own demographic profile. Cultural communities of interest may wax and wane in their activity and can be volatile in their exchanges because those participating may have no common culture or background. They only know each other online.
 	
Organizational communities may be diverse in their personal backgrounds and interests, but their exchanges will be focused on organizational business, and (officially at least) conducted within the culture of the organization.
	• Traditional online communities can form along various lines:
	  • Geographical – e.g., Craigslist.org
	  • Cultural – e.g., politics, religion
	  • Organizational – e.g., company Intranet
	• Online communities have seen explosive growth since 2003 with proliferation of social networks such as Facebook, MySpace, hi5, Bebo, Orkut, etc.
	• Social networks and social media revolve around the users and their relationships
	• Other communities may be centered on a primary social object that may be user-generated or a shared passion
	• Online communities require a means for members to interact with each other
	• These same technologies are allowing organizations to engage their customers more meaningfully online, often in support of real-world interactions

Virtual communities are taking many shapes and forms and can serve various purposes from recruitment, customer research, customer support or teaching and learning. Virtual communities, or online communities, are being driven by the uptake in the use of social media and social networking sites. These technologies, also referred to as social computing, are, in turn, supported by so-called Web 2.0 technologies and represent a paradigm shift in the way people are communicating and collaborating.

The concept of social computing is emerging from the confluence of a desire to harness the interactions of groups of individuals along with the availability of technology platforms that support large-scale collaboration in virtual environments. Such environments can create a new social dimension or extend social interaction among loosely connected participants, provide the means for interaction and information sharing, and allow social patterns to emerge and evolve. They are enabling the growth of communities with unprecedented reach and influence.

Within the enterprise, social computing facilitates many interpersonal functions with business implications, such as internal teaming, problem solving, collaboration, and knowledge management and transfer. Externally, social computing supports deeper, more mutually supportive enterprise relationships by involving customers and suppliers in similar ways at every stage of a business life cycle. As businesses increasingly seek to strengthen their level of engagement with prospects and customers, understanding the power of communities, the multiple personas of their members, their expectations, their aspirations and how to interact with them will become essential skills for business in the 21st century. Stronger customer relationships increase loyalty and brand recognition, and ultimately drive enhanced revenue.

The following are sources of information and research for the 2009/2010 Environmental Scan for Virtual Communities:

1) Gartner.com Research: The Business Impact of Social Computing, 2008 (ID Number: G00161342)
2) Gartner.com Research: Hype Cycle for Social Software, 2008 (# ID Number: G00158239)
3) Gartner.com Research: Key issues for Web 2.0 and Beyond, 2009 (ID Number: G00165114)
4) Gartner.com Research: Virtual Worlds: What to Expect in 2009, 2009 (ID Number: G00162013)
5) Owyang, Jeremiah, "The Future Of The Social Web," Forrester Research, 2009.
6) Li, Charlene & Bernoff, Josh. Groundswell: Winning in a world transformed by social technologies. Boston: Harvard Business Press, 2008.
7) Educause Review – September/October2008 : Higher Education as Virtual Conversation
8) Educause Review: January/February 2009: Open Source: arrowing the Divides Between Education, Business, and Community
9) Rapleaf Study of Social Network Users vs. Age, June 2008, http://www.rapleaf.com/company_press_2008_06_18.html
10) Mainstream Gen Y isn't Buying Into Web 2.0, Ryan Healy, April 29, 2009, http://socialcomputingjournal.com/viewcolumn.cfm?colid=824
11) Nick Bouton, Designing For The Community Experience [VanUE, May 26/09] http://www.slideshare.net/nickbouton/designing-for-the-community-experience-vanue-may-2609-1497974

3.2.5) Virtual Communities Highlights cont.

Opportunities	
Our target audiences will increasingly expect social media to be a part of their BCIT experience. Social media provides significant opportunities when applied to communication and collaboration within the organization, ultimately enhancing real-world community interactions.	• Technologies like OpenID and Facebook Connect will let individuals traverse the Internet with their social connections along for the ride. • The boundaries of social networks and traditional sites will blur, making every Web site into a social experience.

Inhibitors	
The hype around social media has vendors hastily adding social networking features to their products. This is sometimes inappropriate for a given application, and creates multiple places for students, faculty and staff to interact (portals, LMS, websites, intranet). Tools don't work the same in all places and, ultimately, the overall user experience is harmed.	• A tendency to focus on the technologies themselves rather than the business need that might be addressed by engaging in community relationship • Skill sets within IT Services and BCIT are not geared towards building, maintaining or integrating social media and dealing with online community management

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Social media provide several opportunities for interacting with potential students both in the communities in which they're already member, as well as on BCIT properties. Last year, BCIT employed a small social media site (whatwouldyouchange.ca) aimed at engaging potential students on the basis of their interests as opposed to a preconceived notion of BCIT's offering (trades school, etc.). Several of the tools in use in social media can be applied to general customer relationship principles.

Technologies like OpenID and Facebook Connect could also provide an opportunity to remove the barrier to interaction that some potential members might experience if faced with the prospect of having to sign up for yet another site or network. Using these technologies, prospects could sign into our value-added networks using existing credentials, bringing their information and networks with them.

Virtual communities open the door for many students to participate in learning environments at a higher level than they normally might. They can enhance real-world learning (blended approach) and are, obviously, central to pure online learning. Long-term (3-4 yrs) we should attempt ton leverage students' existing social identities, rather than force them to create new, temporary ones within our technological framework (portals, LMS, etc.). There also needs to be support models for faculty and staff to integrate social networking tools and techniques into their business and teaching activities.

3.3) Environmental Scans Supporting Information

- 3.3.1 – Cloud Computing
- 3.3.2 – Evolution and Impact of Mobile Devices
- 3.3.3 – Sustainable Technology
- 3.3.4 – Technology Trends in Higher Education
- 3.3.5 – Virtual Communities

Each year 5 areas area chosen for Environmental Scans. The purpose is to research each of these areas with enough depth to be able to provide a general summary of that area's development and maturity, as well as to be able to provide a summary of those impacts and developments in some context as it may relate to BCIT and/or Higher Education in general. Of the 5 areas being considered in this 3rd Year Addendum, 4 are new and 1 is being repeated from last year. The 4 new ones are:

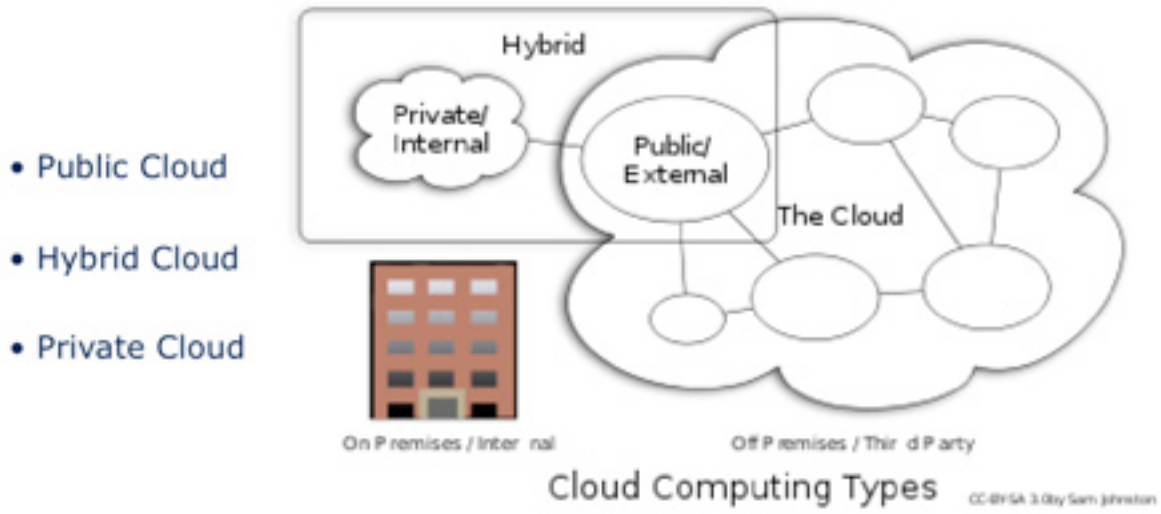
- Cloud Computing
- Evolution & Impact of Mobile Devices
- Sustainable Technology
- Virtual Communities

The one area that is being repeated is:

- Technology Trends in Higher Education

The decision to repeat this area of Environmental Scan is due to the breadth of content that it covers directly related to Higher Education. And given that breadth, there is value in tracking this longitudinally from year to year.

3.3.1) Cloud Computing Types (4)



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This diagram describes at a high level the possible cloud computing types:

• Public Cloud – all infrastructure and services are hosted and delivered off premises by third party resources
• Private Cloud – all infrastructure and services are hosted on premises by internal resources
• Hybrid Cloud – infrastructure and services are hosted in a blended model of public and private clouds

3.3.1) Cloud Computing – Key Characteristics (4)

Architecture	Consists of reliable services delivered through internet based data centres. Commercial offerings meet quality of service (QoS) requirements and offer service level agreements (SLA)
Device/Location Independence	Customers access services from anywhere over the internet via web browsers
Cost and Risk	Customers engaging in cloud computing avoid capital expenditures for hardware and software by using a utility computing or subscription models to access resources as services. This results in a low barrier to entry and avoiding return on investment risk. Essentially CapEx is converted to OpEx
Reliability	Improves for business continuity and disaster recovery as cloud providers have multiple, redundant hosting sites. Challenge with QoS with the public Internet – lack of governance
Scalability	"on demand" provisioning of resources allow customers to grow and scale their services based on performance monitoring – "you only pay for what you use"
Sustainability	Reduces the resource utilization as the infrastructure is hosted offsite

This slide contains the key characteristics of Cloud Computing

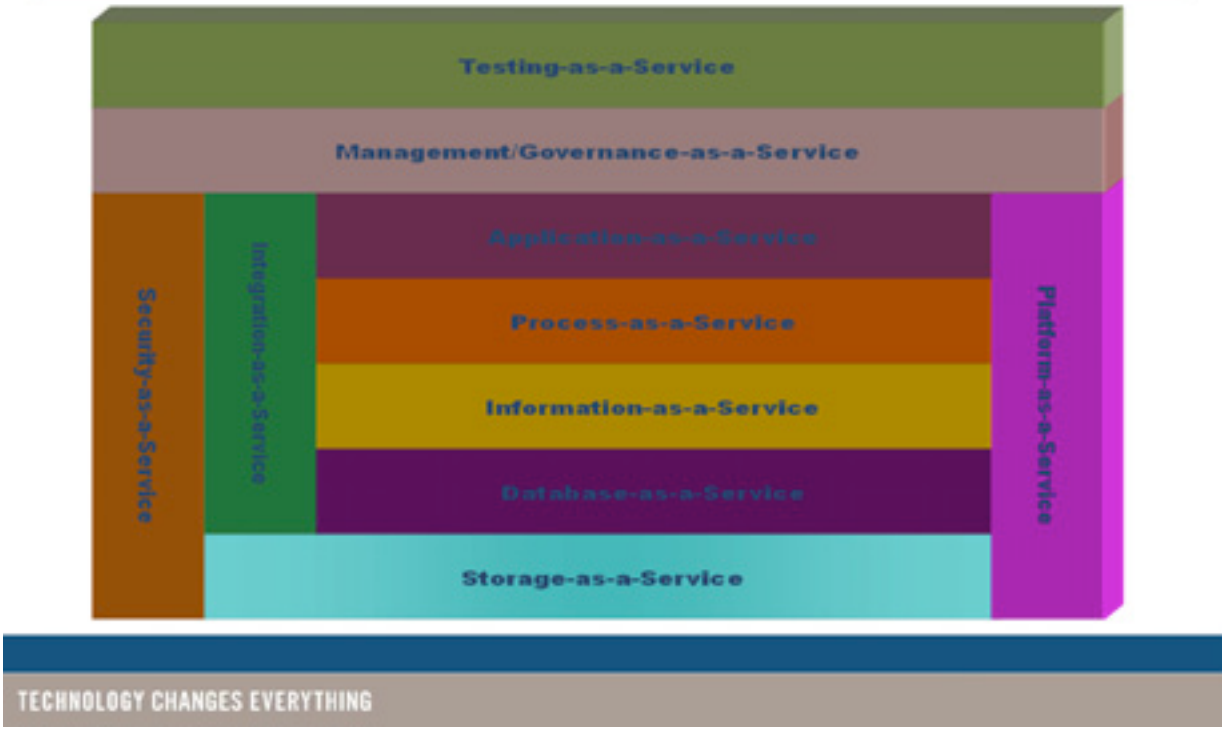
3.3.1) Cloud vs. Not Cloud Computing (1)

Cloud Service	Why it is a Cloud Service	Not Cloud Service	Why it is not a Cloud Service
Video on demand to your home	Delivered Service (1 to many service)	Point-to-point video over the Internet	Feature of the network and devices (1 to 1 service)
FTP as a guaranteed service	Brokered Service through the Internet	FTP as an Internet function	Using a feature of the Internet
Storage as a service (e.g. Amazon, Google Docs)	Service through the Internet	Storing files on remote servers	Infrastructure function
The Web as a service delivery platform	Service through the Internet	The Web and Web pages	An interface layer
Subscription-based Web Based Email Services (e.g. Hotmail, Gmail)	Service is delivered through as standard web browser independent of location	Company hosted Email Services	Private messaging service

Cloud exists when someone takes responsibility for the delivery of a service or resource over the Internet or Web, rather than just uses the Internet or the Web.

The table on this slide compares what is and what is not Cloud Computing.

3.3.1) Defining the Cloud Computing Framework (3)



This diagram shows a framework for understanding a Cloud Computing Framework and showing where all the ?-as-a-Service components are aligned.

3.3.1) Organizing the Clouds "?-as-a-Service" (3)

Service	Description
Governance	the ability to enforce defined policies on data and services
Management	any on-demand service that provides the ability to manage one or more cloud services
Testing	the ability to test local or cloud-delivered systems using testing software and services that are remotely hosted
Security	the ability to deliver core security services remotely over the Internet
Integration	the ability to deliver a complete integration stack from the cloud
Application (aka Software as a Service – SaaS)	any application delivered over the platform of the Web to an end user, typically leveraging the application through a browser
Platform	a complete platform, delivered through a remotely hosted platform to subscribers
Process	a remote resource that's able to bind many resources together to create business processes
Information	the ability to consume any type of information, remotely hosted, through a well-defined interface
Database	the ability to leverage the services of a remotely hosted database, sharing it with other users, and having it logically function as if the database were local
Storage	the ability to leverage storage that physically exists remotely, but is logically a local storage resource to any application that requires storage

These are the definitions of all the "?-as-a-Service"

3.3.1) Cloud Computing Adoption Trends (5)

Pew Research – Cloud Computing Gains in Currency Report, September 2008

- 69% of Internet users make use of cloud computing
- Younger users are avid adopters
- Wi-Fi users are avid adopters
- Ease of use and flexibility draws users
- Data policy is a major concern

* Source: Burton Group 130

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This slide describes the Cloud Computing adoption trends

3.3.1) Cloud Computing Adoption Trends - Overall (5)

Cloud Computing Activities *Internet users who do the following online activities (%)*	
Use webmail services such as Hotmail, Gmail, or Yahoo! mail	56%
Store personal photos online	34
Use online applications such as Google Documents or Adobe Photoshop Express	29
Store personal videos online	7
Pay to store computer files online	5
Back up hard drive to an online site	5
Source: Pew Internet & American Life Project April-May 2008 Survey. N=1,553 Internet users. Margin of error is ±3%.	

The table shows the breakdown of overall Cloud Computing adoption

3.3.1) Cloud Computing Adoption Trends - WiFi (5)

Cloud Computing Activities (% in each group who do the following activities)	All internet users	Those using a laptop to connect with WiFi away from home or work
Use webmail services such as Hotmail, Gmail, or Yahoo! mail	56%	64%
Store personal photos online	34	44
Use online applications such as Google Documents or Adobe Photoshop Express	29	38
Store personal videos online	7	13
Pay to store computer files online	5	10
Back up hard drive to an online site	5	9
Source: Pew Internet & American Life Project April-May 2008 Survey. N=1,553 Internet users. Margin of error is ±3%.		

The table shows the breakdown of overall Cloud Computing adoption using WiFi to access the internet

3.3.1) Cloud Computing Adoption Trends - Age (5)

Cloud Computing Activities by Age Cohorts *Internet users in each age group who do the following online activities (%)*	*18-29*	*30-49*	*50-64*	*65+*
Use webmail services such as Hotmail, Gmail, or Yahoo! mail	77%	58%	44%	27%
Store personal photos	50	34	26	19
Use online applications such as Google Documents or Adobe Photoshop Express	39	28	25	19
Store personal videos	14	6	5	2
Pay to store computer files online	9	4	5	3
Back up hard drive to an online site	7	5	5	4
Have done at least one activity	87%	71%	59%	46%
Have done at least two activities	59	39	31	21
Source: Pew Internet & American Life Project April-May 2008 Survey. N=1,553 Internet users. Margin of error is ±3%.				

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The table shows the breakdown of overall Cloud Computing adoption by age category

3.3.1) Cloud Computing Adoption Trends – Ease (5)

Why people use "cloud" applications

% of those who use online applications and services to store data

	Major reason	Minor reason	Not a reason at all	Don't know / refused
It is just easy and convenient.	51%	23%	23%	3%
I can access this information from whatever computer I am using.	41	25	32	2
I can easily share information with others.	39	28	29	2
I won't lose this information if my computer fails.	34	23	23	3

Source: Pew Internet & American Life Project April-May 2008 Survey. N=999 for those who have used online applications and services to store data. Margin of error is ±3.5%.

The table shows the breakdown of overall Cloud Computing adoption by ease of use

Cloud Computing Adoption Trends - Youth (5)

Younger users particularly appreciate the benefits of the "cloud"

% of those using online applications and services to store data who cite "major reason" for using them

	18-29	30-49	50-64	65+
It is just easy and convenient.	56%	52%	50%	37%
I can access this information from whatever computer I am using.	51	42	34	19
I can easily share information with others.	45	38	39	27
I won't lose this information if my computer fails.	35	35	34	18

Source: Pew Internet & American Life Project April-May 2008 Survey. N=999 for those who have used online applications and services to store data. Margin of error is ±3.5%.

The table shows the breakdown of overall Cloud Computing adoption with youth

Cloud Computing Adoption Trends - Data (5)

Attitudes about possible data policies of "cloud" services

% of those who use online applications and services to store data

Thinking about your data, such as email, photos, and other files that you put on these online services, how concerned, if at all, would you be if companies that provide these services . . .

	Very	Somewhat	Not too	Not at all
Sold your files to others	90%	5%	2%	3%
Used your photos and other information in marketing campaigns	80	10	3	6
Analyzed your information and then displayed ads to you that are based on what you have in the those files	68	19	6	7
Kept a copy of your files even if you try to delete them	63	20	8	8
Gave law enforcement agencies your files when asked to do so	49	15	11	22

Source: Pew Internet & American Life Project April-May 2008 Survey. N=999 for those who have used online services to store personal information. Margin of error is ±3.5%.

The table shows the breakdown of overall Cloud Computing adoption by data security issues


Information Technology Plan for BCIT – Year 3 (2009/2010) Addendum
BCIT
3.3.1) Cloud Computing References - Footnotes
1. Plummer, Daryl C., How to Identify Cloud Computing, Gartner Research 24 June 2008
2. Linthicum, David, Winning with Cloud Computing Step-by-Step, Blue Mountain Labs, March 2009 http://www.slideshare.net/Linthicum/winning-with-cloud-computing-03-09-linthicum-updated-1232608
3. Linthicum, David, Defining the Cloud Computing Framework, Blue Mountain Labs, March 2009
4. Wikipedia, Cloud Computing http://en.wikipedia.org/wiki/Cloud_computing
5. Pew Research, Cloud Computing Gains in Currency, Sept 12, 2008 http://pewresearch.org/pubs/948/cloud-computing-gains-in-currency
TECHNOLOGY CHANGES EVERYTHING

References

3.3.2) Evolution and Impact of Mobile Devices (1 of 2)

Student Use of Mobile Devices

- Students are increasingly self equipped with multiple electronic devices, including laptops, netbooks and/or smartphones.
- These devices tend to be new and technically current.
- Many students prefer to use their own device(s), instead of Institute computer labs.
- Specific programs and courses are requiring use of specialized mobile devices.
- E-books and electronic paper are around the corner.

Faculty and Staff use of Mobile Devices

- There is a growing divide between faculty who embrace and utilize technology and those who evade it.
- Faculty often use Institute allocated laptops in lab and lecture teaching environments.
- Some faculty areas, such as Nursing, are actively exploring the use of hand-held devices to supplement the curriculum
- There are examples of other Post Secondary institutions such as Abilene Christian University in Texas where each incoming student is given a device (iPhone or iTouch) preloaded with University specific applications such as Way-Finding, built in "clickers" for polling, etc.

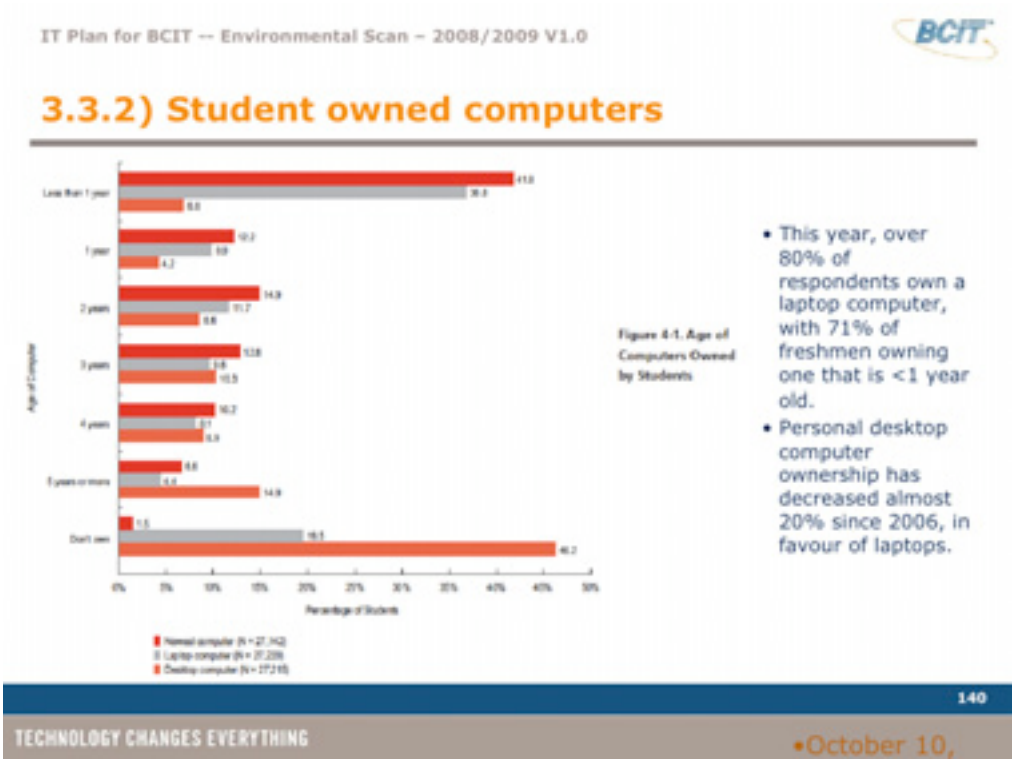
3.3.2) Evolution and Impact of Mobile Devices (2 of 2)

Key Issues of Mobile Devices

- Variety of devices arriving on campus - diverse in vendor, OS, software, form, hardware specifications, etc.
- Network connectivity – various technologies, speeds and availability.
- Short lifespan of devices and frequent emergence of new devices and vendors.
- Elevating expectation of "anytime, anywhere" access.
- Recent history has shown the smartphone industry prone to big bets, not evolutionary changes.
- While e-books and electronic textbooks are an eventual inevitability, price, technology and competing standards are currently frustrating its adoption at present.

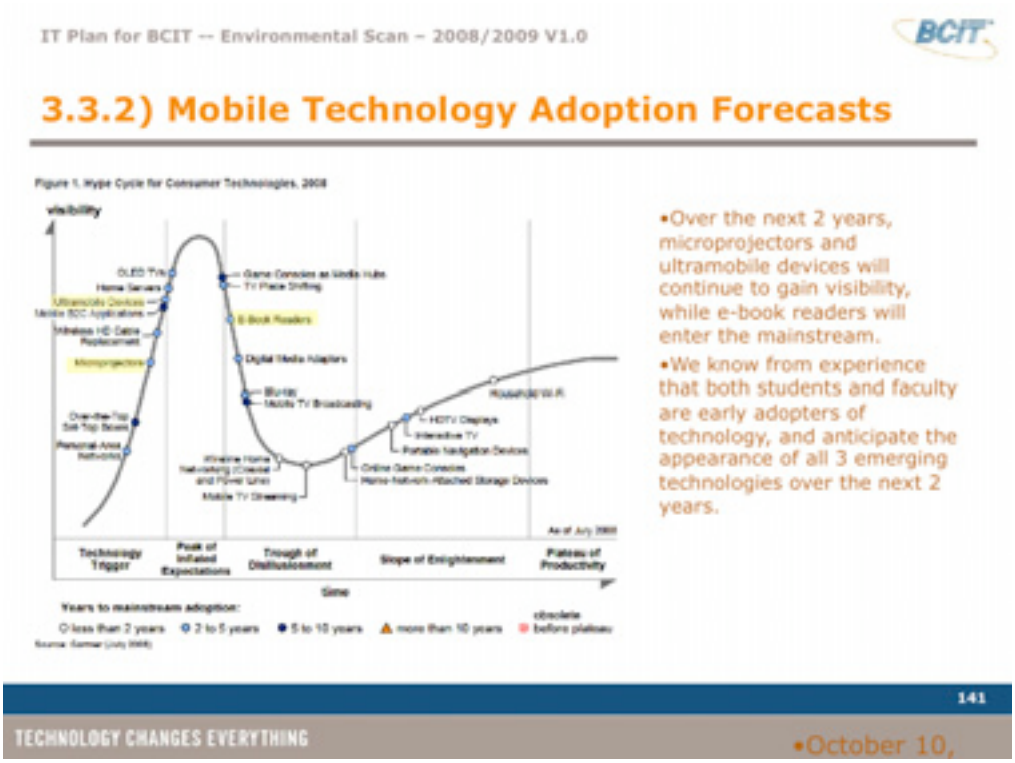
Opportunities

- Utilizing student-owned devices tied with BCIT's AppsAnywhere (Citrix) deployment may reduce the need for computer labs as we know them now.
- A more diverse computing environment enables education akin to the "real-world" experience BCIT strives to deliver.



Incomplete – text coming from Colin – April 30

Educause, 'The ECAR Study of Undergraduate Students and Information Technology, 2008' (Research Study, Volume 8), 21 October 2008



Microprojectors: The idea of carrying around a tiny projector for is attractive, but today's models consume a lot of power and don't perform well in all lighting conditions. They are

also expensive. Since most rooms have conventional display equipment available, microprojectors are best considered luxuries for now.

Ultramobile Devices: Mobile Internet Devices (MIDs) are more a matter of speculation than they are real products, but planners should monitor progress during the next two years. Recognize that these devices will be accessing Institute networks. These devices are not-so-distant cousins to the mini-notebook (aka netbook PCs) devices we are already beginning to see on campus.

E-book Readers: While the technology for e-book readers has improved, the devices still suffer from proprietary file formats and digital rights management technologies that limit the sources of digital media. While most of the readers support some additional document formats such as PDF files, the available readers force consumers to buy from the online store that is associated with the reader. This lack of a standardized format for e-books, along with relatively high costs for the devices, has limited the adoption of e-book readers. The Amazon Kindle does have potential to change the business model, with its wireless distribution model, which could change the economics of e-book readers and e-book distribution if it can achieve a critical mass.

Gartner, 'Hype Cycle for Consumer Technologies, 2008,' ID Number: G00159536, 2 July 2008

3.3.2) Mobile Devices

- Most users select two devices, one each from the content consumption and content creation categories.
- Users tend to have two distinct parts to their day:
  - they are seated, wanting a large screen, comfortable keyboard and room to layout documents
  - they need a device in mobile mode that is lightweight and focused only on the essential tasks.

Most users will possess one device for content creation in semi-mobile scenarios (multiple seated locations) supplemented by one device for content consumption in fully

mobile scenarios.

Many users dream of a single device. To make this dream a reality, one must focus on the ability of a device to expand into content creation. Mobile devices can easily process knowledge worker content creation via attached keyboard, mouse and external screen. Examples are Celio's Redfly product, and Lenovo's recently announced Lenovo Constant Connect with BlackBerry. This vision has been stymied by the clumsiness of carrying and connecting several components. Also, Windows isn't on smartphones, thus compromising compatibility in content creation applications.

The MID and mini-notebook categories have been called the "one kilogram wasteland." Such devices have never done well over the long term because content consumption and creation

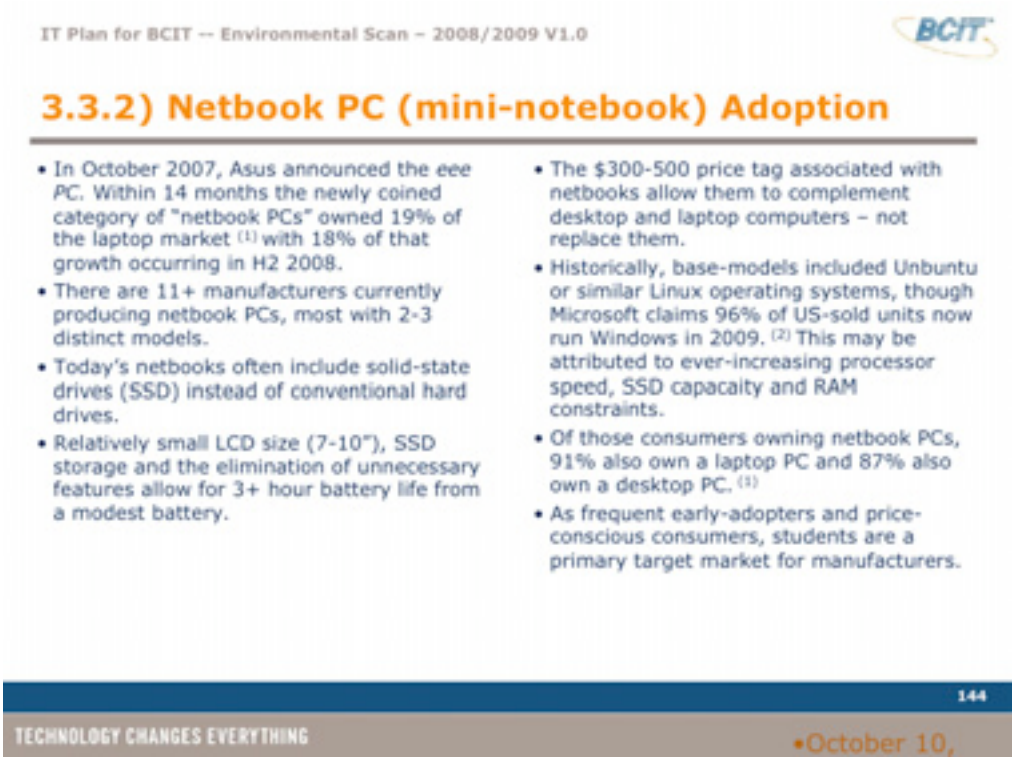
needs drive devices to smaller or larger sizes. Every few years, we see vendors come into this area saying that their time has come, only to fade away. Certain task-specific devices, such as MIDs, can be persistent in the market for a time; but as their functionality is subsumed into other devices, their days may also be numbered. Because of a long history of vendors abandoning products in the 4-inch to 10-inch screen range, buyers should be wary.

Gartner, 'From Smallest to Largest, a Continuum of Mobile Devices,' ID Number: G00165968, 10 April 2009

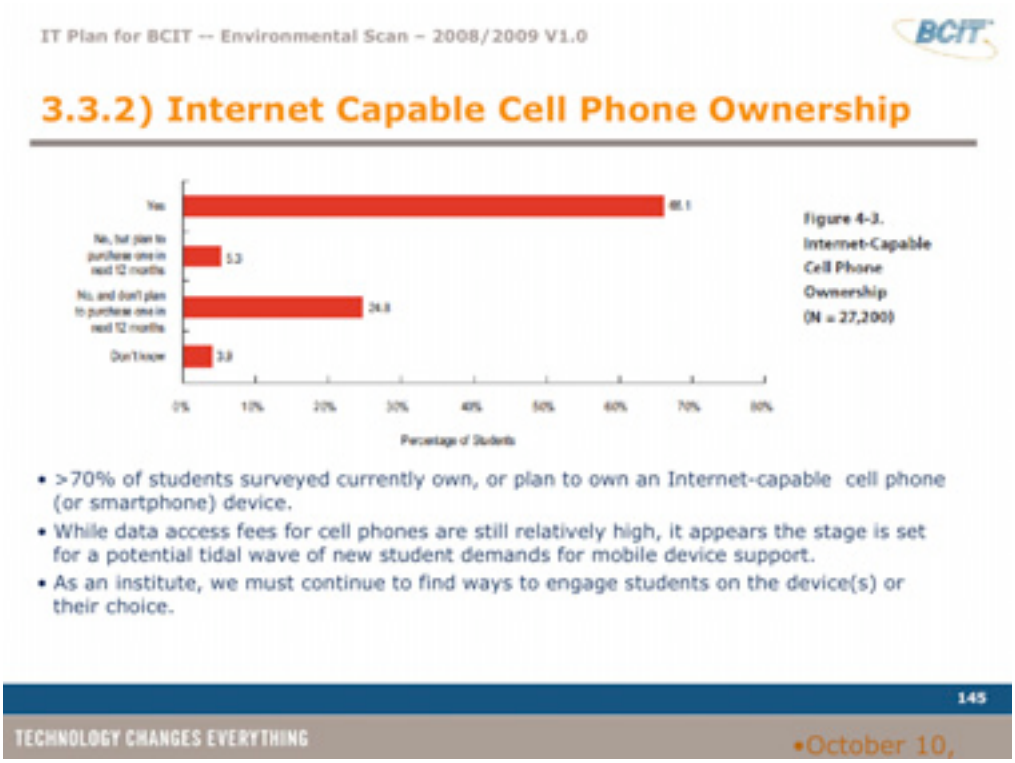
3.3.2) E-book Readers

Amazon Kindle 2 and Sony Reader PRS-700

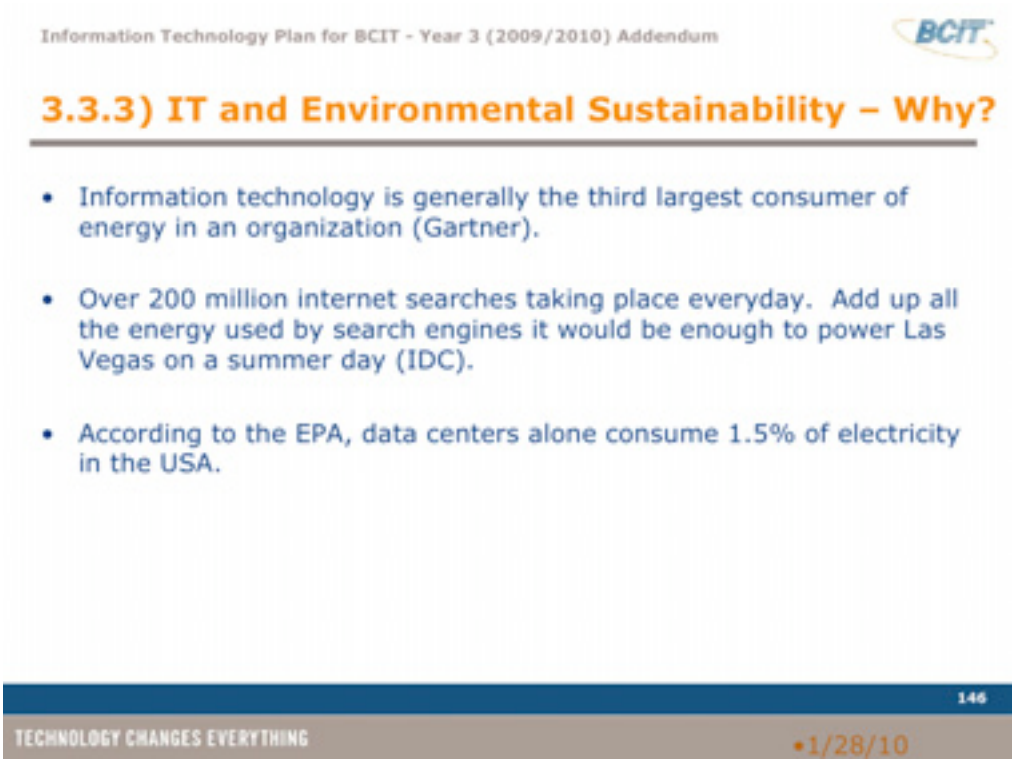
- Amazon's Kindle and Sony's Reader are the major players in the market.
- Currently available only in the US, Kindle exploits its e-commerce capabilities through wide-area cellular networks to deliver an interesting, though still relatively narrow, range of content.
- While Sony leads Amazon in global growth, and has a more mature Reader, it may prove difficult to compete with a top 10 online retailer.
- The $400 price tag, proprietary formats, human attachment to paper and a limited library or titles preclude these devices from mainstream acceptance in the immediate future.



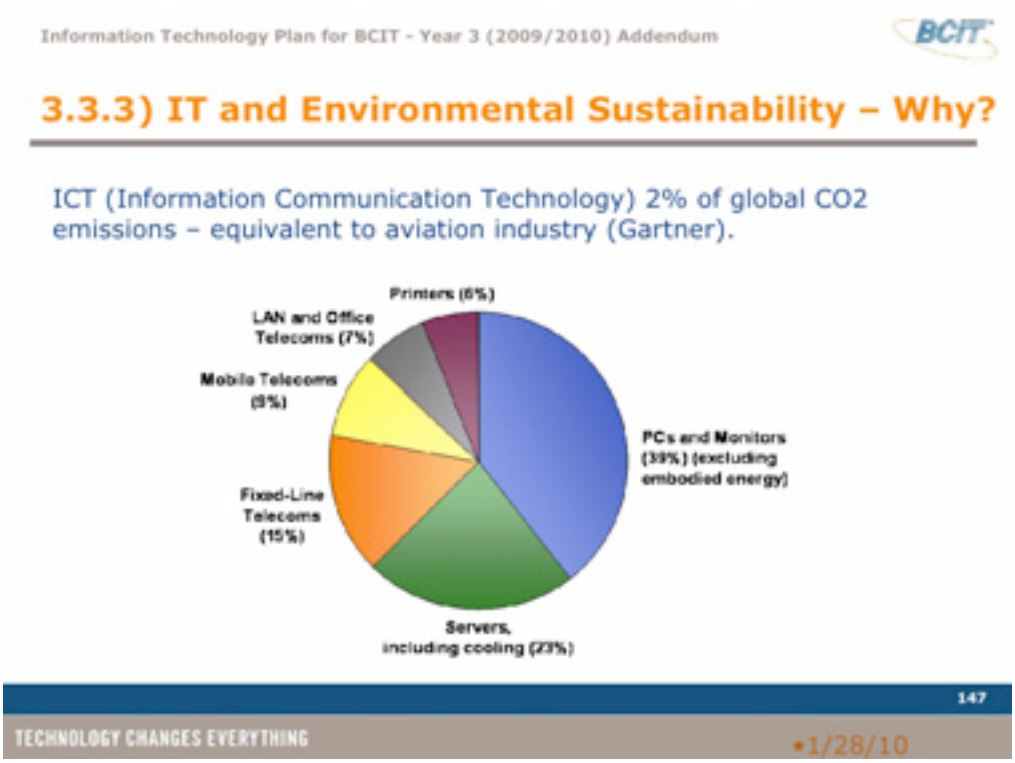
[1] PriceGrabber, "Netbook Trends and Solid-State Technology Forecast," January 2009
[2] Microsoft, "Windows on Netbook PCs: A Year in Review," 3 April 2009



Educause, 'The ECAR Study of Undergraduate Students and Information Technology, 2008' (Research Study, Volume 8), 21 October 2008

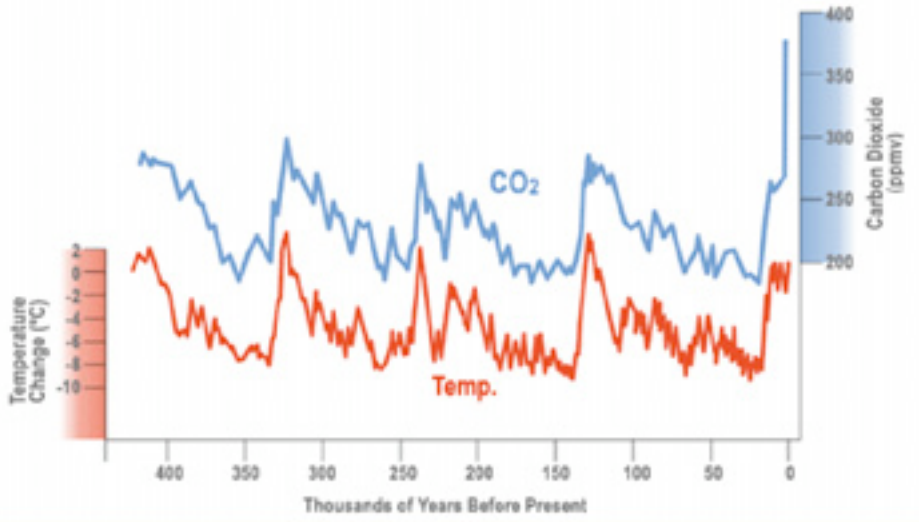


BCIT, as with all post secondary institutions in British Columbia have been challenged by the Ministry to strive for a 'carbon neutral' state in the very near future. Since Information Technology is generally the 3rd largest consumer of energy in most commercial organizations, it makes sense to focus here early at BCIT. It is fully in line and supports the Institute's sustainability programs.



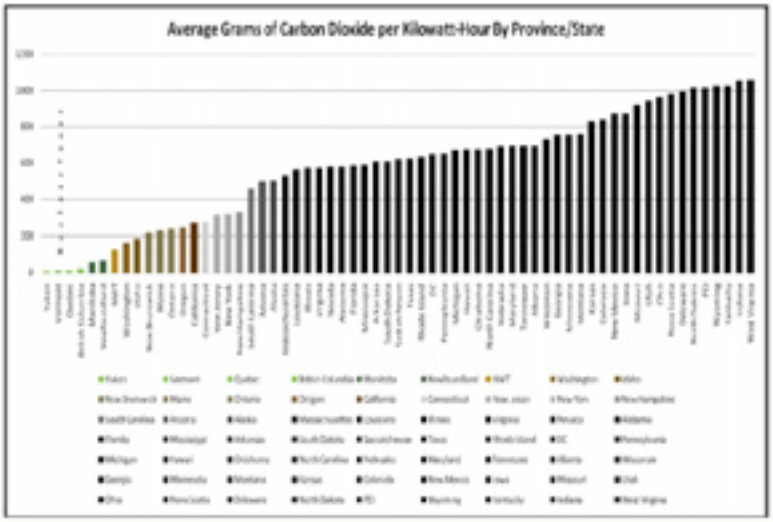
The chart above delineates that components of IT that contribute to global CO2 emissions. The 2 largest components are the traditional end devices and display/ monitors, along with the back end servers (computers) that are connected across the network for file and print services. IT Services started a concerted effort 2 years ago to move into a virtualized server architecture, where multiple physical servers can be virtualized off a single, larger, more powerful server. This saves on energy to power the equipment, on air conditioning to cool the equipment, and reduces the amount of 'embedded' energy because of the fewer physical components.

3.3.3) IT and Environmental Sustainability – Why?

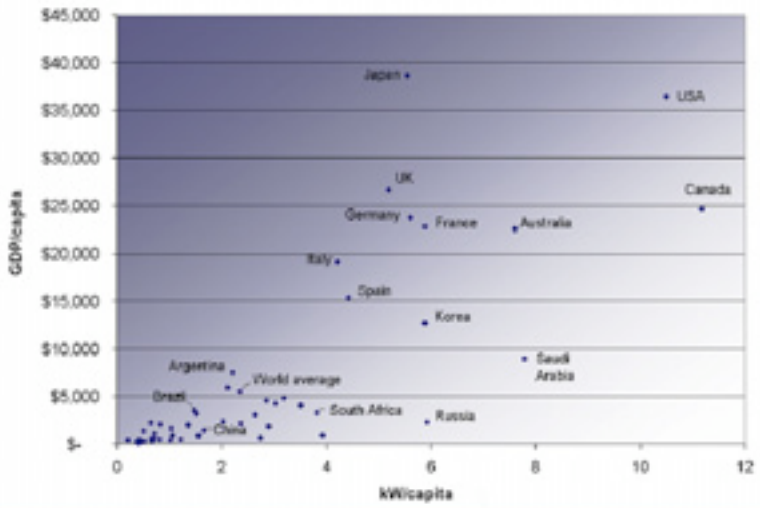


3.3.3) Carbon Dioxide – Generation

RackForce Networks Inc.



3.3.3) Electricity Use



3.3.3) LCD versus CRT

LCD monitors are more energy efficient than CRT monitors (30W versus 60W).

Converting from CRT to LCD monitors, we roughly estimate the energy savings at:

30W/hour x 1500 work hours/year x 4000 monitors =

180,000 kWh/year

Study (U of Texas) embodied energy and toxins CRT monitors slightly better than LCD monitors.

120 million LCDs sold (2005)

3.3.3) Laptops

Laptops are more energy efficient than desktop computers (70W charging/30W not charging versus 130W).

Converting half our administrative computers to laptops, we roughly estimate the savings at:

60W/hour x 1500 work hours/year x 1500 laptops =

135,000 kWh/year

Lithium Ion Batteries now
(sans Lead, Mercury, Cadmium)

Mercury in some CF backlights

3.3.3) Power Saving Software

Faronics – Power Save Software

- BCIT - BC Hydro Power Smart Partner – Energy Study
- A typical desktop PC with a 17-inch LCD monitor requires about 100 watts—65 watts for the computer and 35 watts for the monitor. If left on 24x7 for one year, this same computer will consume 874 KWh of electricity—that's enough to release 340 kg. of carbon dioxide into the atmosphere and the equivalent of driving 1319 km. in the average car! (Faronics)

- 10,000 PCs operating 24/7 consume $1.4m per annum in electricity (Gartner)
- Typical power management technology and techniques can bring the PC electrical consumption down to 8 hours per day generating $930k saving (Gartner)

3.3.3) Greener Electronics

Our laptop vendor for the past four years, Toshiba, was ranked second by Greenpeace (tied with Sony and Samsung) out of the top 18 manufacturers of personal computers, mobile phones, TV's and games consoles according to their policies on toxic chemicals, recycling and climate change. Nokia is top ranked.

www.greenpeace.org/electronics
(November 2008)

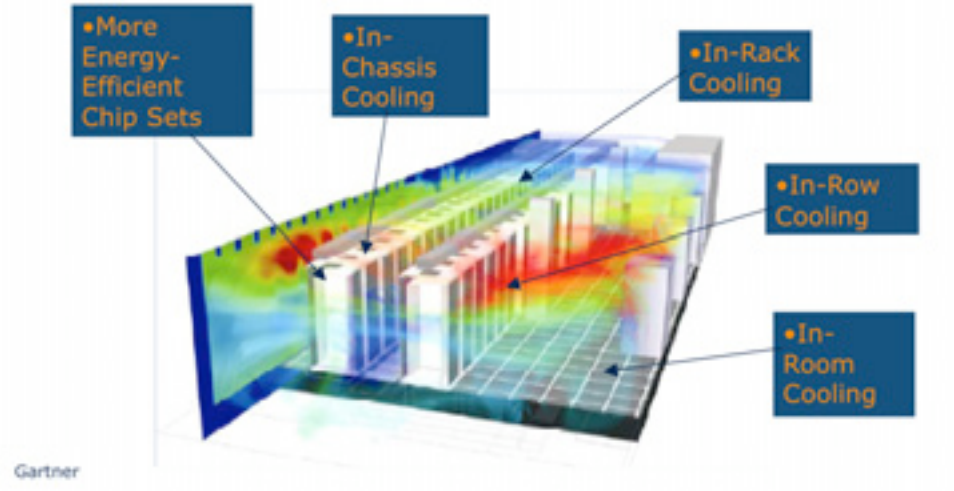
3.3.3) Smart Power Strips

Smart power bars - www.bitsltd.net

- controlled outlets shut off when computer goes to sleep
- application peripherals that do not need to be powered while computer is asleep (i.e. speakers, printers, scanners).
- $7 rebate from BC Hydro Power Smart Program

Estimated savings:
80kWh/year x 1500 potential admin computers = 120,000 kWh/year.

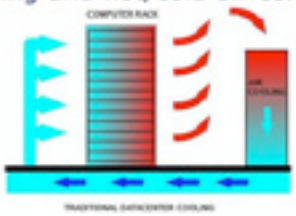
3.3.3) Data Centers

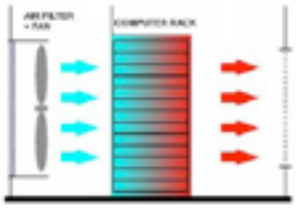


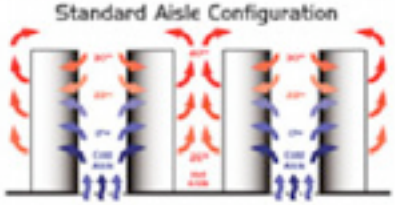
Gartner

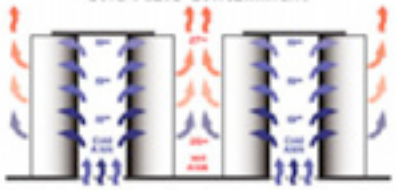
3.3.3) Data Centre Cooling

Data centre cooling upgrades for efficiency (implementation of free air cooling and hot/cold air containment) reduces energy consumption.









3.3.3) Server Virtualization

On average servers are 90% idle (EPA report to Congress).

Server virtualization reduces devices and consolidates processing.

- We have added 6 virtual hosting servers to date and have decommissioned 128 servers as a result.
- We plan to add another 8 virtual hosting servers to consolidate an additional 90 servers and avoid adding 70-110 servers.

Individual Servers:

200W/hour x 8760 hours/year x 300 servers = 525,600 kWh/year

Virtual Hosting Servers:

1500W/hour x 8760 hours/year x 14 servers = 183,960 kWh/year

Difference ~ 340,000 kWh/year

3.3.3) Server Blade Centers

- Implementing server blade centers
- Increased performance per watt
- Less material than individual server
- Reduction in the number of:
  - Power supplies
  - Fans
  - Network cards
  - SAN cards
  - Consoles
  - Removable media drives

3.3.3) Storage Area Networks

- SAN (Storage Area Network)
- More energy efficient – less materials than individual servers
- Disk resources centralized (less waste)
- Extends useful life of disks
- New technology unneeded disks spin down until required.

3.3.3) Purchasing/Selection Standards

45. Environmental Stewardship

a. In pursuit of the BCIT's Environmental Stewardship and Sustainability Practices (ESSP) initiative on green procurement all desktop system unit, monitor and notebook manufacturers must commit to a comprehensive, nationally recognized environmental standard for:

   a) The reduction or elimination of environmentally hazardous materials
   b) Design for reuse and recycle
   c) Energy efficiency
   d) End of Life Management for reuse and recycle
   e) Environmental stewardship in the manufacturing process
   f) Packaging

b. Preference will be given to devices that are certified through either the Environmental Choice Program (ECP), or the Electronic Product Environment Assessment Tool (EPEAT Silver level). As a minimum, it is expected that devices be Energy Star compliant. If certified, bidders must include proof of certification in their bid proposal. Any vendors which may not be compliant within one of the sustainability programs should be working towards achieving certification in order to maintain their status within the terms of the contract.

Program information, registry and certification details are available at the following web sites:

www.environmentalchoice.com
www.epeat.net
www.energystar.gov

3.3.3) EPEAT

Electronic Product Environmental Assessment Tool

- Evaluates electronic products in relation to 51 total environmental criteria contained in IEEE 1680 and EnergyStar 4.0

EPEAT Bronze– Meets the 23 required criteria

EPEAT Silver– Meets 23 required criteria and at least 14 optional criteria

EPEAT Gold– Meets 23 required criteria and at least 21 optional criteria

- www.epeat.net

3.3.3) EPEAT

Product Information

Product Type: Notebooks
Product: Toshiba Satellite A300-PSA30U; PSA34U; PSAG4U; PSA60U
Manufacturer: Toshiba
URL: http://www.toshiba.com
Rating: EPEAT SILVER
Listing Date: 4/29/2008
Monitor Type: NA
Monitor Size: NA
Product Status: Active
Exceptions:

IEEE 1680-2006 Criteria Category Summary	Optional Points
4.1 Reduction/elimination of environmentally sensitive materials	6/8
4.2 Materials selection	0/3
4.3 Design for end of life	4/5
4.4 Product longevity/life cycle extension	2/2
4.5 Energy conservation	1/2
Corporate Annual Report Points	
4.6 End of life management	1/1
4.7 Corporate performance	2/2
4.8 Packaging	3/4
Total Optional Points:	**19/27**

3.3.3) Energy Star/Environmental Choice

Energy Star expected:

- computers
- laptops
- monitors

Weighted criteria:

Environmental Choice – (EcoLogo Program)

- Sets standards and certifies products in more than 120 categories
- Printers, copiers, consumables
- www.environmentalchoice.com

3.3.3) Printing/Paper

Duplex printing, 2 or 4 Up printing, scanning and Acrobat Professional as options to printing.

- On average office workers print 12,000 sheets per annum, with 44% shown to be unnecessary (Gartner)
- 10,000 people produce 120m sheets of paper per annum (Gartner)
- A ream of paper is 500 sheets and costs $5.00 (Gartner)
- Eliminating just half this wasted paper produces a $264k saving (Gartner)
- www.papercalculator.org

3.3.3) Paper

- 1 ton of paper = 400 reams = 200,000 sheets
- 1 tree makes 16.67 reams of copy paper or 8,333 sheets
- 1 ream (500 sheets) uses 6% of a tree (and those add up quickly)
- Production of 1 ton of copy paper produces 2,581 kg. of green house gases (the equivalent of 6 months of car exhaust)
- Making one single sheet of copy paper can use over 284 ml. of water– more than a typical soda can
- Production of 1 ton of copy paper produces 86,700 liters of waste water
- Production of 1 ton of copy paper uses 11,134 kWh (same amount of energy used by an avg. household in 10 months)

3.3.3) Printing

- Eliminate individual faxes, scanners and printers
  - use a single multifunction devices.
- Larger shared printers better than many individual printers (reduce the number of devices – consolidation – less devices more energy efficient).
- Implementing student pay printing helps eliminate frivolous printing. Duplex printing option (favourably priced over simplex – single sided printing) helps reduce paper consumption.

3.3.3) Paper(less)

- Print to fax (avoid using paper to fax). We have provisioned print services so staff can send faxes without printing.
- Send feature on MFDs to create electronic copies to reduce paper consumption. Creates pdf files from printed copies instead of photocopying.
- Adopting "Think before you print" e-mail footers.

Please consider the environment before printing this e-mail

- Administration licensed for Adobe Professional to reduce paper consumption (electronic forms, pdf attachments instead of printed reports, file downloads instead of brochures and printed material, print to file, electronic annotations).

3.3.3) Paper(less)

- Using electronic systems to reduce paper, for example our document management system for admissions, e-hire system, electronic purchase requisitions (in progress) reduce paper consumed for record keeping.
- WebCT, TLM, and D2L and other learning management systems reduce paper consumption, electronic copies of course materials, assignments, tests, electronic marking (reduce paper consumption).
- Purchase re-useable media (CD-RW, DVD-RW, USB sticks).
- Web technology to reduce paper (i.e. BCIT Update now on-line/pdf newsletter flagged to not allow printing)

3.3.3) Travel(less)

Technology to reduce intercampus and other travel:

- Videoconferencing/Telepresence (i.e. Kelowna Hospital, SST team meeting)
- Webinars
- Teleconferencing bridge
- Virtual classroom i.e. Elluminate Live
- Unified communications (future initiative)

3.3.3) Videoconferencing/Telepresence

3.3.3) Ecological Footprint Data

- Electricity (each building)
- Gas (each building)
- Solar (each building)
- Hidden flows (mine dumping and back filling)
- Water Usage
- Rainfall
- Liquid Container (paper cartons)
- Card packaging
- Plastic film
- Glass bottles
- Steel cans
- Aluminum cans
- Aluminum foil
- Plastic bottles
- Whole milk
- Skim milk
- Yoghurt
- Cheese
- Beef & veal....
- Fresh fruit....
- Consumables (paper , notebooks, pencils, pens..)
- Electrical (computers, AV equipment, batteries)
- Office Furniture (tables, desks, chairs, shelves..)
- Grounds keeping (pesticides, fertilizers
- Student/Research labs
- BCIT owned vehicles (number, kilometres)
- Gasoline, diesel, natural gas (motor vehicle fuels)
- Maintenance & manufacturing
- Road space
- Car occupancy
- Staff and student travel
  - By Car
  - By Bus
  - By Skytrain
  - By Ferry
  - By Air
  - Walking
  - Carpool/vanpool
- Burnaby lot size Campus (excluding green space)
- Vegetated areas (does not include planters)
- Timber Wood
- PVC-pipes
- Chemicals
- Sheet metals
- Metals
- Metals, Steel, iron
- Wood
- Bricks
- Plaster
- Glass
- Concrete
- Tiles
- Plastics (PVC)
- Crushed Gravel
- Asphalt
- Sand
- Earth
- Transport
  - Food
  - Construction material
  - Direct consumables (Chemicals, office supplies)
  - Road materials
  - Electrical equipment
  - Waste transportation
- Landfill
- Sewage/ storm water
- Paper, Card
- Metals
- Compost
- CO2, CFC, HFC, CH4
- PM2.5, PM10, O3, NOX, SOX, CO, VOC, NH3

3.3.4) Technology Trends in Higher Ed

3.3.4) Technology Trends – Hype Cycle (Gartner)

Figure 1. Hype Cycle for Higher Education, 2009

Source: Gartner (June 2009)

3.3.4) Technology Trends – Adoption/Benefit

3.3.4) Technology Trends – Open Source Trends

Figure 1. Using Specific-to-General Functionality Versus Local-to-Global Need to Understand OSS Success in Higher Education

Source: Gartner – Open Source in Higher Education, 2008 (Doc ID: G00155456)

3.3.4) Technology Trends – IT Leadership Skills

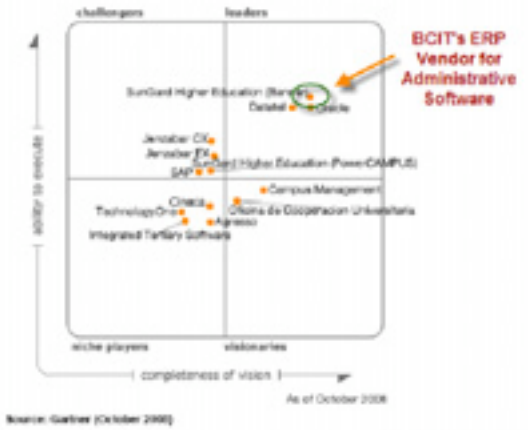
Figure 2. 2007 IT Leadership Needs for Higher Education

Source: Gartner (2007)

Source: Gartner – Setting IT Priorities in Higher Education, 2008 (Doc ID: G00158544)

3.3.4) Technology Trends – ERP Market

Figure 1. Magic Quadrant for Higher Education Administrative Suites



Source: Gartner – Magic Quadrant for Higher Education Admin Suites 2008 (Doc ID: G00161549)

3.3.4) Technology Trends – Driving Forces

Figure 1. STEEP: Forces of Change Create a New World

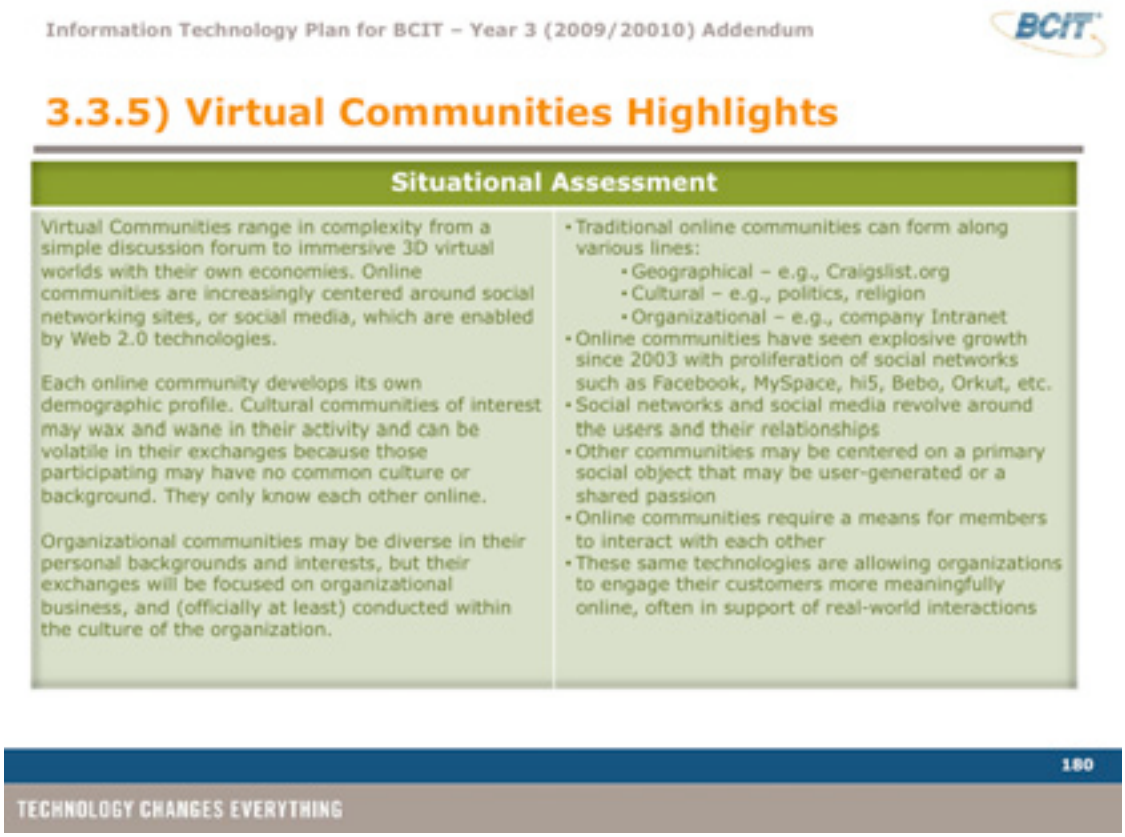
- Societal
  - Globalization death of distance/ clash of cultures
  - Digital natives
  - Retiring baby boomers
- Technological
  - Consumerization
  - Personal infrastructure
  - Social software
  - Standardization
  - ADAM (SaaS, cloud computing)
- Economic
  - Cost of education
  - Cost of energy (travel/heating)
  - Spreading market mind-set
  - Mergers and acquisitions
- Political
  - Bologna
  - Industrialization of HE
  - Focus on ROI => e.g., shared services
  - Need for more knowledge workers
  - Ownership of accreditation
- Environmental
  - Green IT — green everything ...
  - Emerging nations' activities putting restraints on natural resources and available "pollution space"

ADAM = alternative delivery and acquisition model; HE = higher education

Source: Gartner (February 2009)

Source: Gartner – Key Issues for Higher Education, 2009 (Doc ID: G00165540)

TECHNOLOGY CHANGES EVERYTHING



3.3.5) Virtual Communities Highlights

Situational Assessment

Virtual Communities range in complexity from a simple discussion forum to immersive 3D virtual worlds with their own economies. Online communities are increasingly centered around social networking sites, or social media, which are enabled by Web 2.0 technologies.

Each online community develops its own demographic profile. Cultural communities of interest may wax and wane in their activity and can be volatile in their exchanges because those participating may have no common culture or background. They only know each other online.

Organizational communities may be diverse in their personal backgrounds and interests, but their exchanges will be focused on organizational business, and (officially at least) conducted within the culture of the organization.

- Traditional online communities can form along various lines:
  - Geographical – e.g., Craigslist.org
  - Cultural – e.g., politics, religion
  - Organizational – e.g., company Intranet
- Online communities have seen explosive growth since 2003 with proliferation of social networks such as Facebook, MySpace, hi5, Bebo, Orkut, etc.
- Social networks and social media revolve around the users and their relationships
- Other communities may be centered on a primary social object that may be user-generated or a shared passion
- Online communities require a means for members to interact with each other
- These same technologies are allowing organizations to engage their customers more meaningfully online, often in support of real-world interactions

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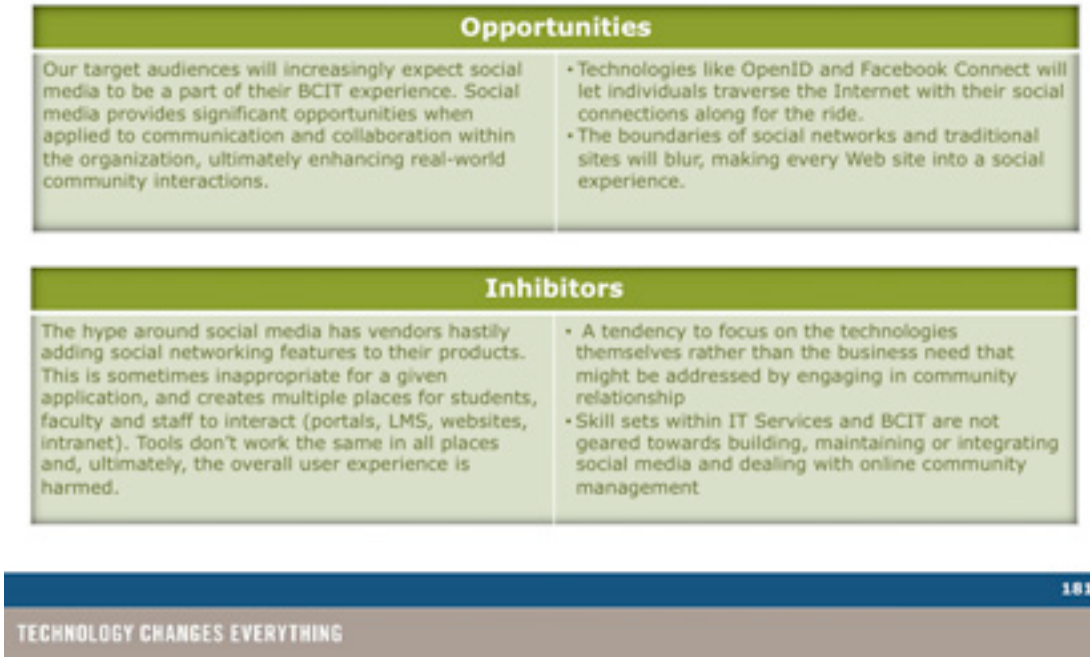
TECHNOLOGY CHANGES EVERYTHING

Virtual communities are taking many shapes and forms and can serve various purposes from recruitment, customer research, customer support or teaching and learning. Virtual communities, or online communities, are being driven by the uptake in the use of social media and social networking sites. These technologies, also referred to as social computing, are, in turn, supported by so-called Web 2.0 technologies and represent a paradigm shift in the way people are communicating and collaborating.

The concept of social computing is emerging from the confluence of a desire to harness the interactions of groups of individuals along with the availability of technology platforms that support large-scale collaboration in virtual environments. Such environments can create a new social dimension or extend social interaction among loosely connected participants, provide the means for interaction and information sharing, and allow social patterns to emerge and evolve. They are enabling the growth of communities with unprecedented reach and influence.

Within the enterprise, social computing facilitates many interpersonal functions with business implications, such as internal teaming, problem solving, collaboration, and knowledge management and transfer. Externally, social computing supports deeper, more mutually supportive enterprise relationships by involving customers and suppliers in similar ways at every stage of a business life cycle. As businesses increasingly seek to strengthen their level of engagement with prospects and customers, understanding the power of communities, the multiple personas of their members, their expectations, their aspirations and how to interact with them will become essential skills for business in the 21st century. Stronger customer relationships increase loyalty and brand recognition, and ultimately drive enhanced revenue.

The following are sources of information and research for the 2009/2010 Environmental



3.3.5) Virtual Communities Highlights cont.

Opportunities	
Our target audiences will increasingly expect social media to be a part of their BCIT experience. Social media provides significant opportunities when applied to communication and collaboration within the organization, ultimately enhancing real-world community interactions.	• Technologies like OpenID and Facebook Connect will let individuals traverse the Internet with their social connections along for the ride. • The boundaries of social networks and traditional sites will blur, making every Web site into a social experience.

Inhibitors	
The hype around social media has vendors hastily adding social networking features to their products. This is sometimes inappropriate for a given application, and creates multiple places for students, faculty and staff to interact (portals, LMS, websites, intranet). Tools don't work the same in all places and, ultimately, the overall user experience is harmed.	• A tendency to focus on the technologies themselves rather than the business need that might be addressed by engaging in community relationship • Skill sets within IT Services and BCIT are not geared towards building, maintaining or integrating social media and dealing with online community management

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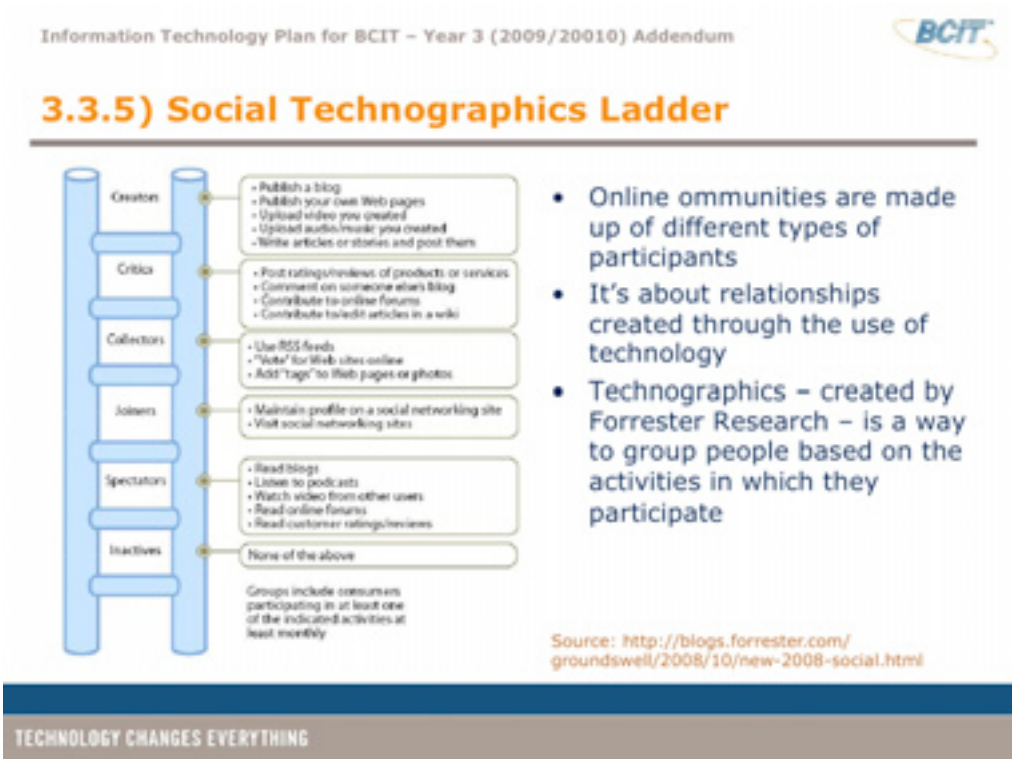
TECHNOLOGY CHANGES EVERYTHING

Social media provide several opportunities for interacting with potential students both in the communities in which they're already member, as well as on BCIT properties. Last year, BCIT employed a small social media site (whatwouldyouchange.ca) aimed at engaging potential students on the basis of their interests as opposed to a preconceived notion of BCIT's offering (trades school, etc.). Several of the tools in use in social media can be applied to general customer relationship principles.

Technologies like OpenID and Facebook Connect could also provide an opportunity to remove the barrier to interaction that some potential members might experience if faced with the prospect of having to sign up for yet another site or network. Using these technologies, prospects could sign into our value-added networks using existing credentials, bringing their information and networks with them.

Virtual communities open the door for many students to participate in learning environments at a higher level than they normally might. They can enhance real-world learning (blended approach) and are, obviously, central to pure online learning. Long-term (3-4 yrs) we should attempt ton leverage students' existing social identities, rather than force them to create new, temporary ones within our technological framework (portals, LMS, etc.). There also needs to be support models for faculty and staff to integrate social networking tools and techniques into their business and teaching activities.



Social Technographics, as developed by Forrester Research, classifies people according to how they use social technologies. Forrester can quantify the number of online consumers within these groups using consumer surveys.

•**Creators** make social content go. They write blogs or upload video, music, or text.

•**Critics** respond to content from others. They post reviews, comment on blogs, participate in forums, and edit wiki articles.

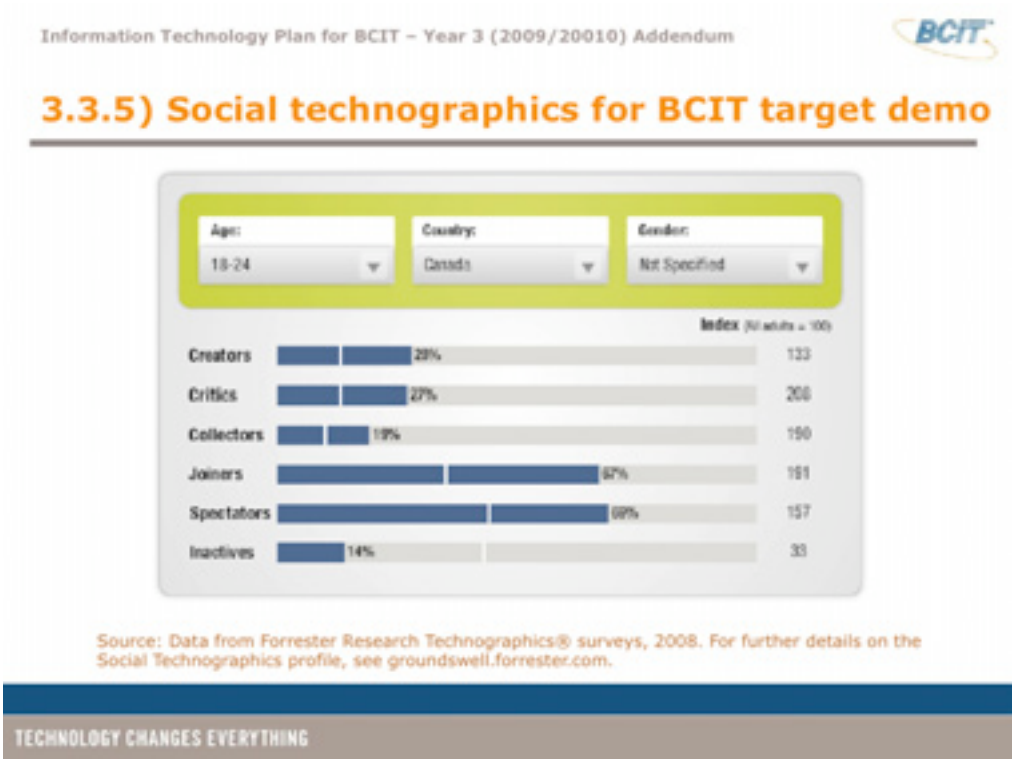
•**Collectors** organize content for themselves or others using RSS feeds, tags, and voting sites like Digg.com

•**Joiners** connect in social networks like MySpace and Facebook

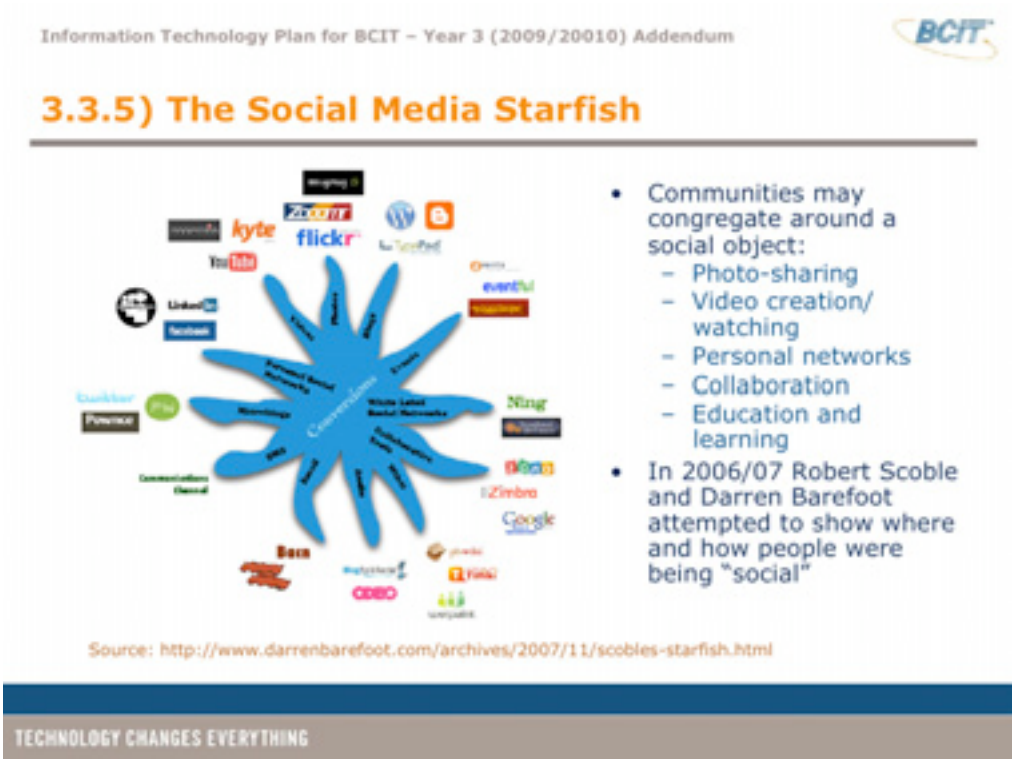
•**Spectators** consume social content including blogs, user-generated video, podcasts, forums, or reviews

•**Inactives** neither create nor consumer social content of any kind

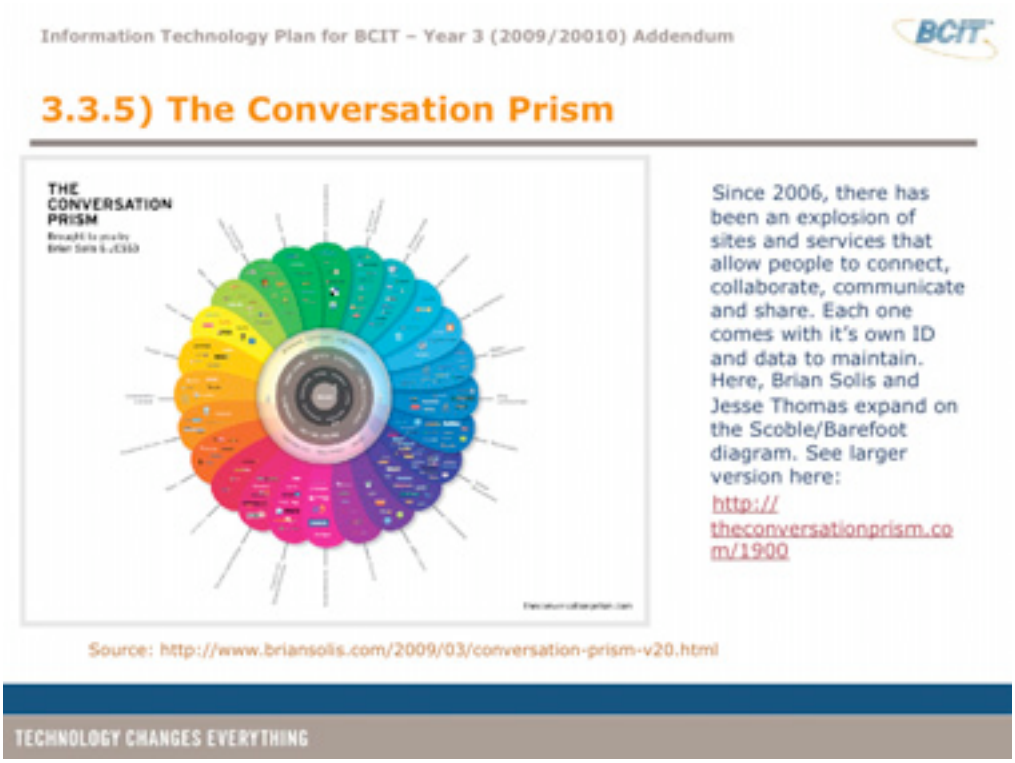
By examining how they are represented in any subgroup, strategists can determine which sorts of strategies make sense to reach their stakeholders. Start with your target audience and determine what kind of relationship you want to build with them, based on what they are ready for. Forrester has provided an online profiling tool to get a sense of your customers here: http://www.forrester.com/Groundswell/profile_tool.html.



BCIT's primary target market is 18-24 year-olds (male and female) in Canada. This chart shows that this demographic is highly involved in the various roles of online community and social networking. The white lines represent the level of participation for all adults in Canada. An index over 100 indicates an above-average level of participation. In Canada, more than two-thirds of 18-24 year-olds are participating in social media (joiners, spectators) while nearly a third are contributing content (creators, critics).

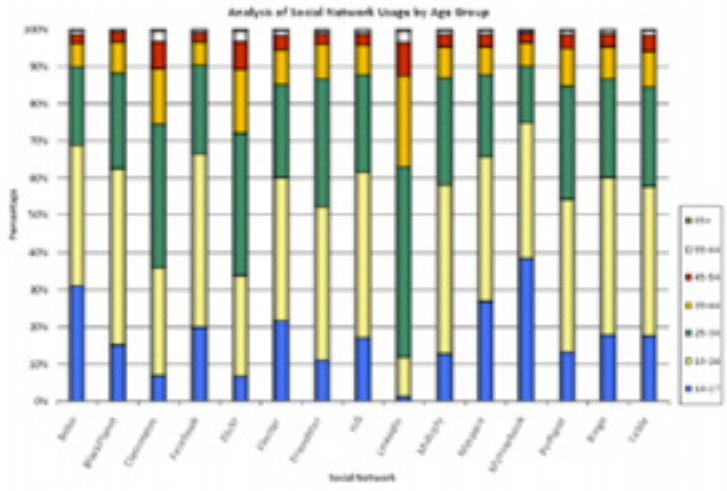


This is an example of just some of the communities that people are participating in including the primary focus of each.

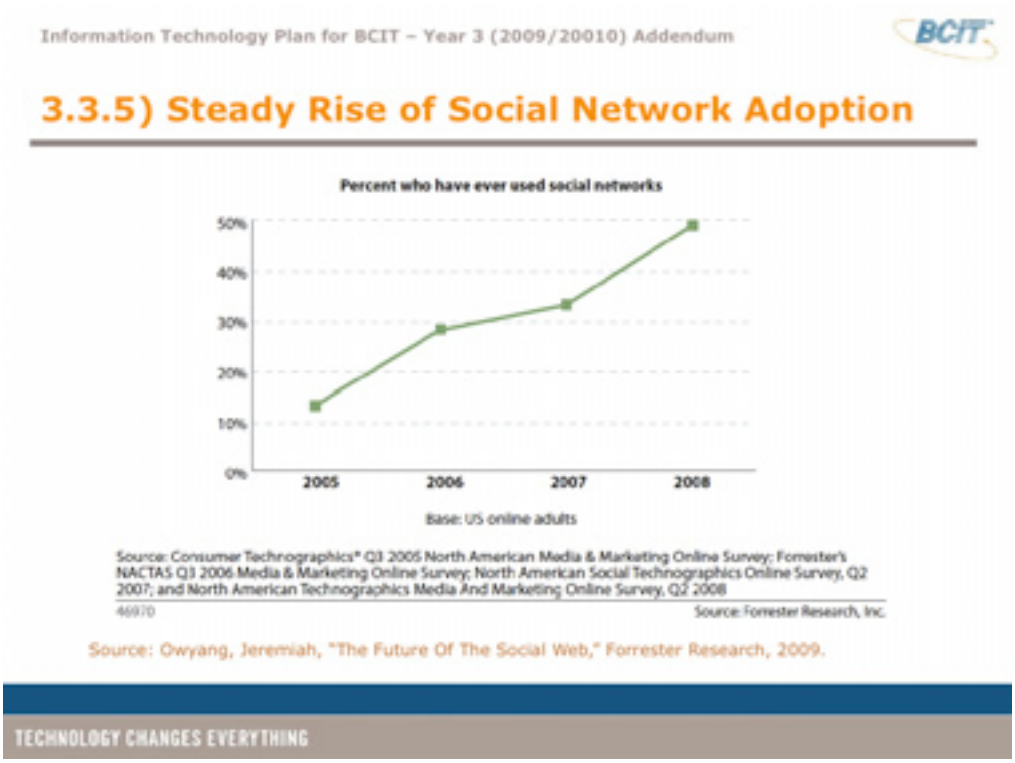


Although this graphic is hard to make out (click link for a more legible version) it emphasizes the number and variety of social networking and community sites available to people today.

3.3.5) Social network useage by age group



Source: http://www.rapleaf.com/company_press_2008_06_18.html



The past five years of social network evolution have been about growth of adoption. Over the next the next few years:

Consumers will share their experiences but still can't connect them across networks.

This creates friction for consumers who must now manage multiplying personal information and username/ password combinations.

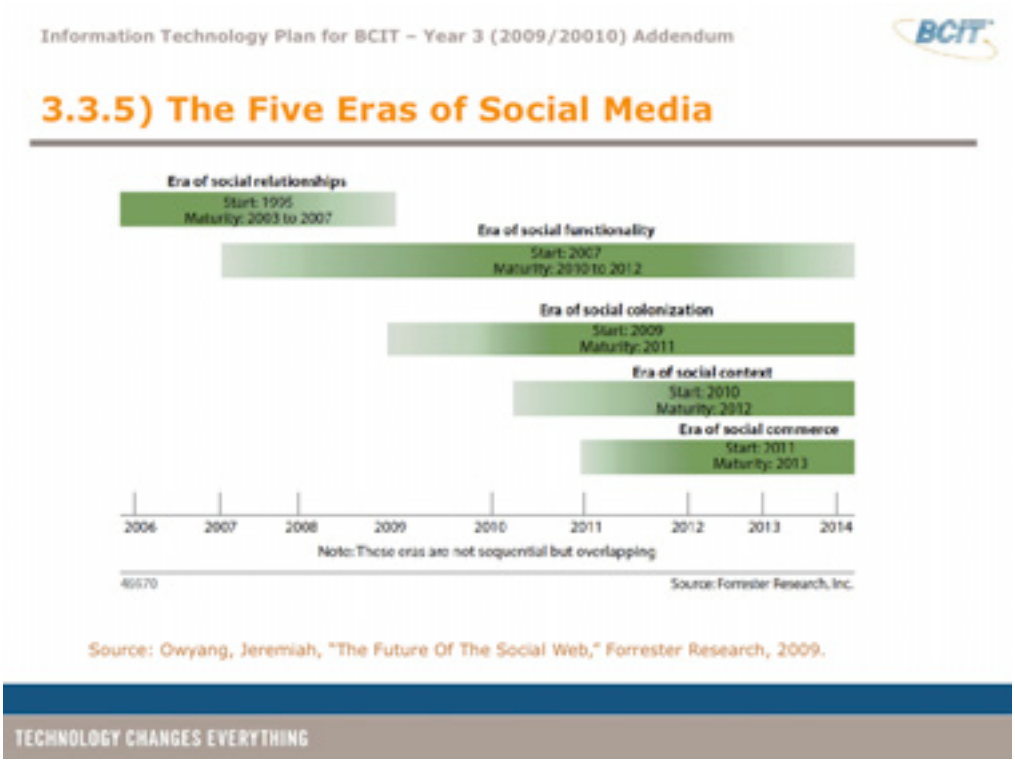
Social networks have evolved into operating systems, but their reach is limited.

Even as people are frustrated by the boundaries between sites, the social network sites are chafing at the limits of their reach. Facebook's influence, for example, stops when you browse elsewhere.

Brands connect with profiles and applications but can't reach the whole audience.

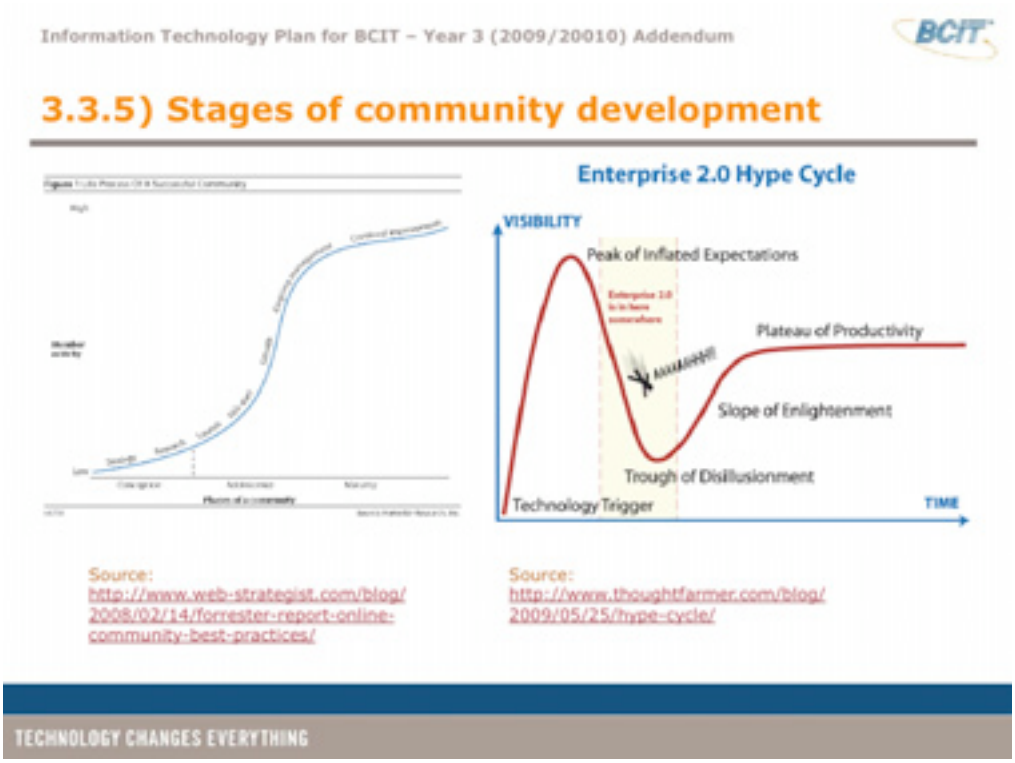
Whether brands attract consumers to their own social community or chase them in the sites they frequent, they still seem to be connecting with "identities," not actual people**.**

Source: Owyang, Jeremiah, "The Future Of The Social Web," Forrester Research, 2009.



1. **The era of social relationships. This was the first stage of the Social Web, starting in the mid-**1990s with communities like AOL and maturing a few years ago. In this era, people connected to each other using simple profiles and friending features to share information, discussions, and media.1 While this era is the foundation of the changes to come, in this document we'll be concentrating on the next four eras — the future of the Social Web.
2. **The era of social functionality. Today's social networks have evolved beyond "friending" into** platforms that support social interactive applications and provide new meaning and utility to communities. Even so, social relationships are still locked up within sites.
3. **The era of social colonization. In the next stage of social evolution, starting later in 2009,** technologies like OpenID and Facebook Connect will let individuals traverse the Internet with their social connections along for the ride. The boundaries of social networks and traditional sites will blur, making every Web site into a social experience.
4. **The era of social context. Next year, as sites begin to recognize people's personal identities and** their social relationships, they will customize visitors' experiences based on their preferences, their behaviors, and who their friends are. In addition to enabling more intense social applications, in this stage social networks will absorb features of email and become a base of operations for everyone's online experiences.
5. **The era of social commerce. Starting about two years from now, as social networks become the** repository for identities and relationships, they will become more powerful than corporate Web sites and CRM systems. Communities will become the driving force for innovation. As a result, brands will cater to communities, resulting in a power shift toward the connected customer.

Source: Owyang, Jeremiah, "The Future Of The Social Web," Forrester Research, 2009.



Whether we're fostering communities for prospecting/recruitment, customer service, or employee collaboration and communication, there is more to consider than just the technology and they're success is ultimately measured by member activity and/or participation. Fr communities geared towards external prospects or current students, we need to ensure that there are internal people available to nurture and manage those communities.

Internally, Enterprise 2.0 is often used to refer to the adoption of Web 2.0 technologies (at the root of social media and social networks) at the enterprise level. This is evident in the SharePoint suite, which allows people to have "My Sites" much like a Facebook profile, and facilitates interaction, collaboration and communication across the organization. As suggested in the diagram above, however, these endeavours are currently in the "Trough of Disillusionment" on Gartner's hype cycle (Note: there isn't actually a hype cycle for Enterprise 2.0, but the suggestion is that for many, the promise of Enterprise 2.0 hasn't yet played out).

INFORMATION TECHNOLOGY SERVICES

Information Technology Plan for BCIT – Year 3 (2009/2010) Addendum

Section 4:
Year 3 (2009/2010) Revised Roadmap Initiatives

BCIT

bcit.ca

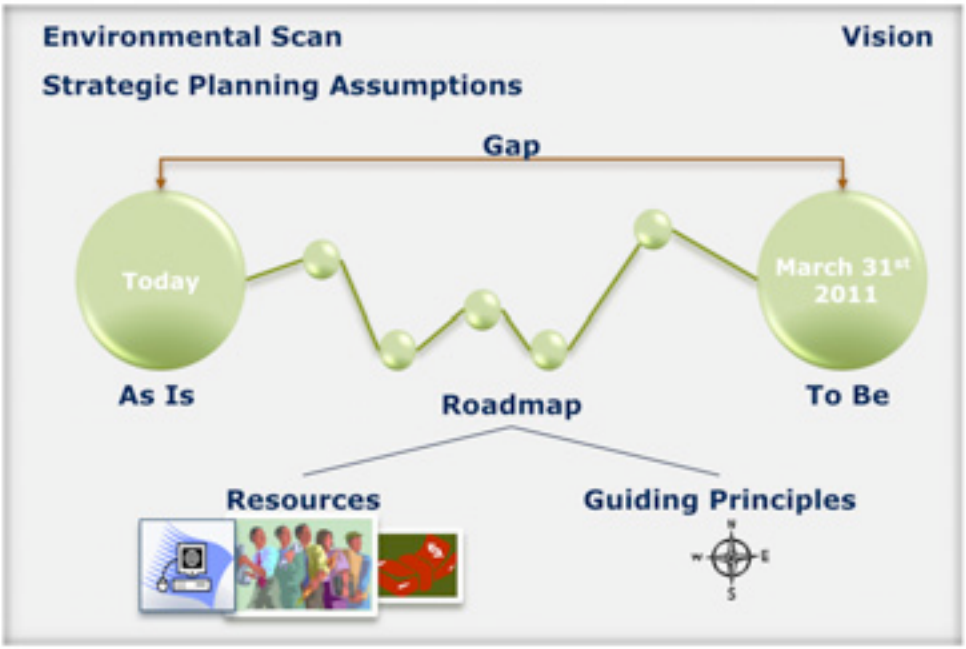
TECHNOLOGY CHANGES EVERYTHING

Table of Contents

INTRODUCTION

- Plan Framework
- Guiding Principles

Plan Framework



Environmental Scan
: Global, higher educational and technology trends

Strategic Planning Assumptions
: Statements of our future such as growth rates, locations, services that the plan must support

Vision
: Timeless statements of our aspirations

To Be State
: How the vision will manifest itself at the end of the planning horizon

The As Is State
: A qualitative and quantitative description of the current environment

Gap
: The difference between the As Is and To Be State

Roadmap
: The series of initiatives with measurable outcomes that will bridge the gap

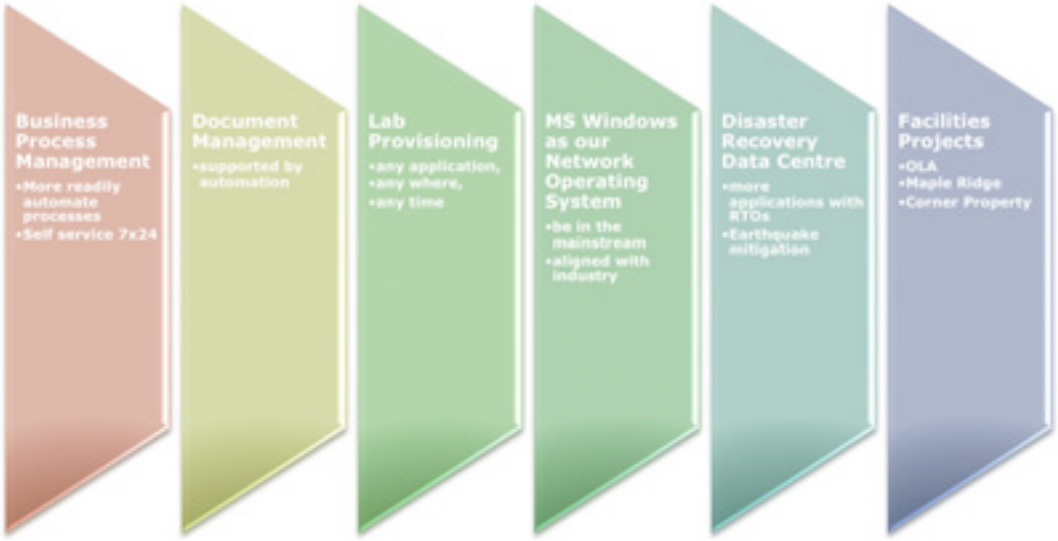
Resources
: What is required in terms of funding, staffing and other resources required to carry out the roadmap

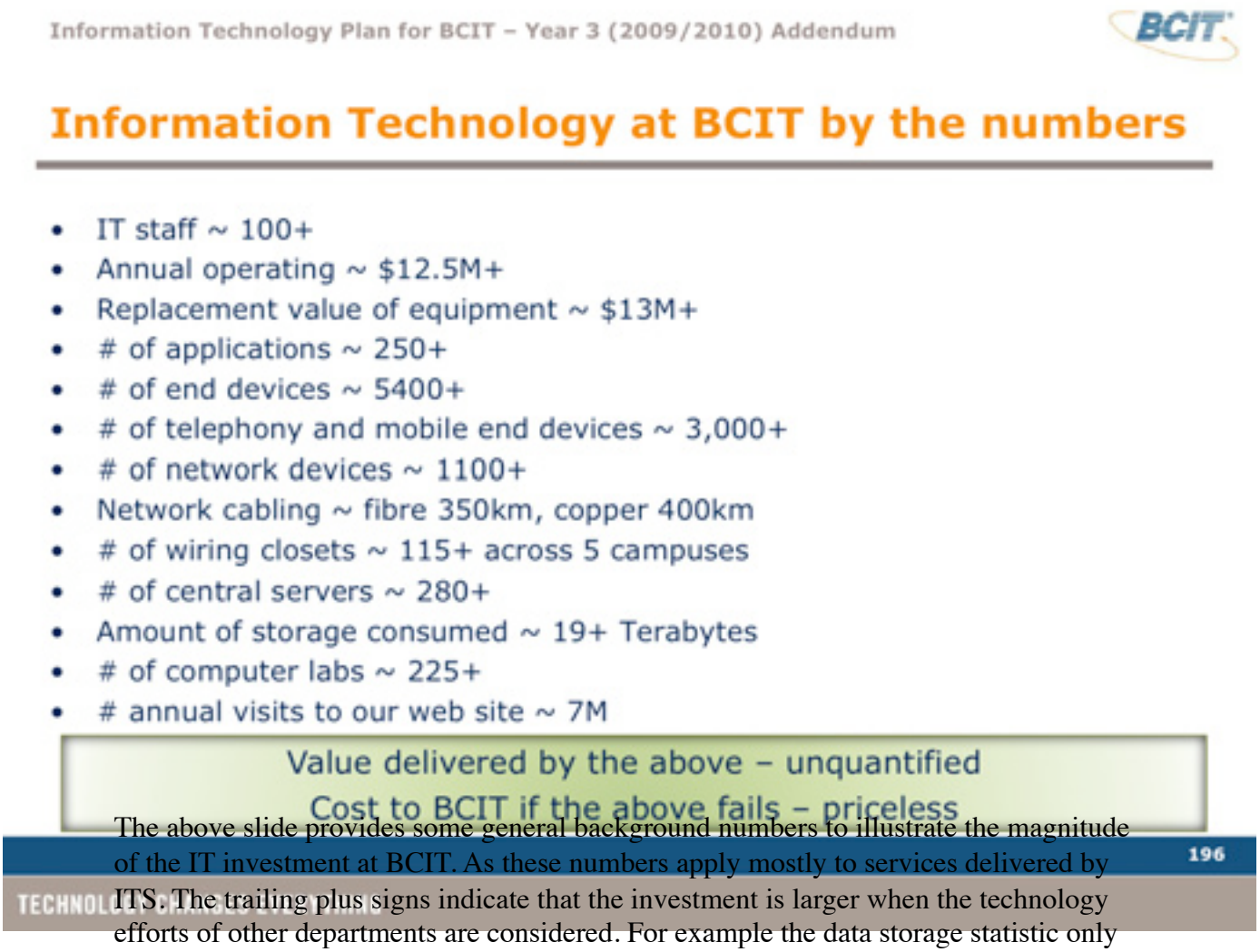
Guiding principles
: The set of design principles used to build the roadmap and to be used when adjusting the roadmap to unplanned events

Guiding Principles

- Create and measure business value
- Recognize people, processes and technology are all required to achieve results
- Enable rather than do
- Exploit what we have, then buy what we need, build only if necessary
- Prefer depth over breadth
- Take standards based approaches
- Focus on results but keep compliance needs in mind
- Blend mainstream and innovative technology appropriately
- Avoid mortgaging the future
- Link to Foundation and Applied Research opportunities

Specifics


Business Process Management
•More readily automate processes
•Self service 7x24
Document Management
•supported by automation
Lab Provisioning
•any application,
•any where,
•any time
MS Windows as our Network Operating System
•be in the mainstream
•aligned with industry
Disaster Recovery Data Centre
•more applications with RTOs
•Earthquake mitigation
Facilities Projects
•OLA
•Maple Ridge
•Corner Property



The above slide provides some general background numbers to illustrate the magnitude of the IT investment at BCIT. As these numbers apply mostly to services delivered by ITS. The trailing plus signs indicate that the investment is larger when the technology efforts of other departments are considered. For example the data storage statistic only includes the data stored on the central SAN (Storage Areas Network) maintained by ITS and not the data contained on departmental systems such as the PACS (Picture ArChiving System) of the School of Health Sciences.

Questions arising from the data:

1. What is the value delivered by this technology investment? Can this be quantified? If not for historical investments then for future investments?
2. What are the consequences of failures of IT? See also Business Continuity.
3. How does BCIT compare to other organizations when comparing IT investments to outcomes?

ROADMAP UPDATES

- 2008/2009 Progress Against Roadmap Activities
  - Business Initiatives
  - Facilities Support Initiatives
  - IT Renewal and Improvement Initiatives
- 2009/2010 to 2011/2012 Updated Roadmap Activities
  - Business Initiatives
  - Facilities Support Initiatives
  - IT Renewal and Improvement Initiatives

2008 – 2009 Progress Report

- Business Initiatives
- Facilities Support Initiatives
- IT Renewal and Improvement Initiatives

2008/09 Progress - Major Business Initiatives

Year		2008-09				Progress	
Quarter	0	1	2	3	4	Status	Notes
Ongoing IT Planning						As Planned	Ongoing
Establish IT Governance						Overdue	Moved to 08/09
IT Business Case Methodology						Complete	
Document Management						Complete	
Business Process Management							
Constituent Relationship Management						Underway	Ongoing
Lab Provisioning						Underway	Ongoing
Workforce Planning / Succession Mgmt							
Enterprise Perf. Mgmt (KPIs)							
IT Continuity Mgmt						Underway	Ongoing
Small Project Work						Underway	Ongoing

Data Current as of: Oct, 2008 199

TECHNOLOGY CHANGES EVERYTHING

Ongoing IT Planning 1Q of each year for strategic planning 3Q for operational planning. <<Proceeding as planned>>.

Establish IT Governance – self explanatory – needed before next round of strat planning. <<No progress. Restarting initiative in Q2-08>>.

IT Business Methodology – no resourcing required. <<New standard for Strategic Initiative Business Case introduced. Further maturation required>>.

Document Management – 1 BU per year not dependent on Banner Upgrade– resourcing required. <<Project completed in Admissions>>.

CRM – Improvements to Program & Course Catalogue, and re-launch of Banner Recruitment Module. <<Some progress made. A new project is being introduced in Q2/Q3 2008 that redirects MarComm adverting Budget to online recruitment strategies. Ongoing initiative>>.

Lab Provisioning – resourcing required. <<Dependent on NOS project. Proceeding as planned for year 1, initial roll out in 08/09>>.

Workforce planning – start in second year due to workload – resourcing required. <<No activity planned for 08/09>>.

EPM – shouldn't start before BCIT Strat and Education plans are available – resourcing required. <<No activity planned for 08/09>>.

IT Continuity Management – lets use the ITIL term rather than DRP. Initiative is active this year. Next year we should extend the number of applications covered by RTO's. The year after we should establish a DRP site outside the lower mainland – resourcing required. <<08/09 DRP/BCP activities underway working toward a full failover test with client involvement for November 2008>>.

Small Project Work – work coming from the application backlog management process – resourcing required. <<BAAC approval to defer project list until after Banner Upgrade (August 2008). Six month "small project" work-list renegotiated and approved for 2nd half of 2008/2009>>.

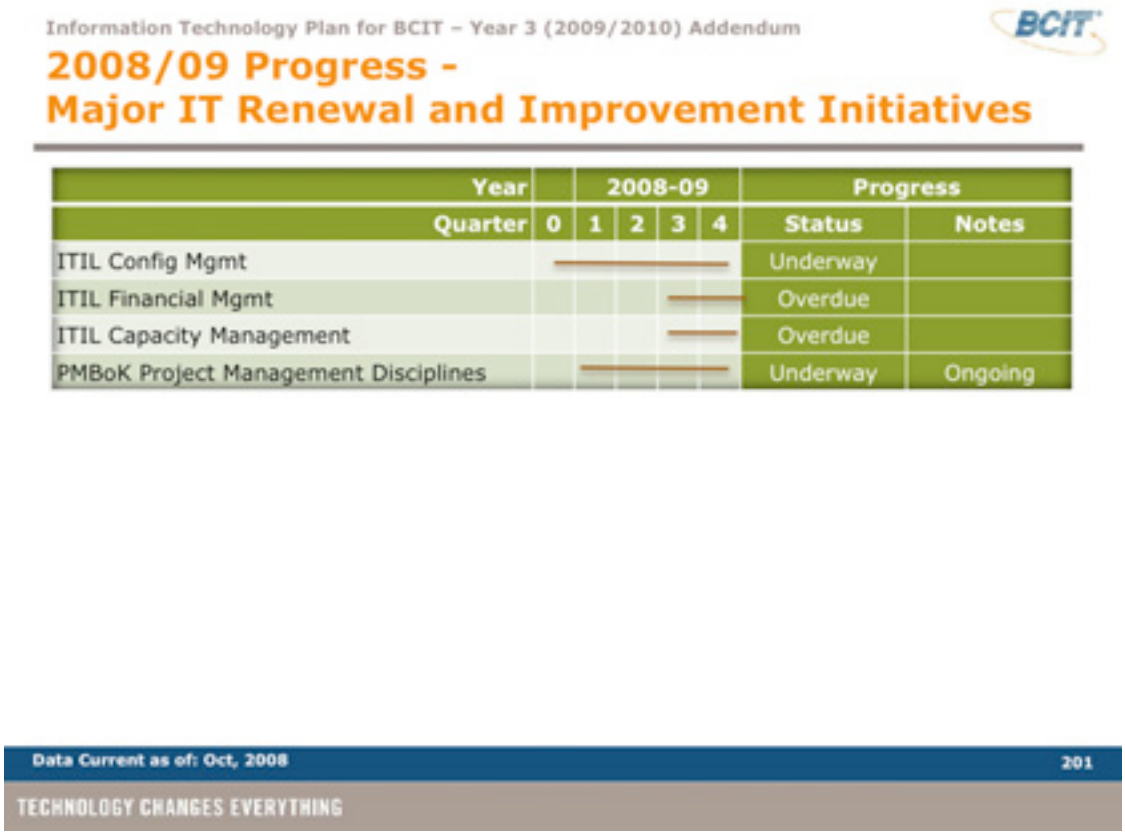
2008/09 Progress - Facilities Initiatives

Year		2008-09				Progress	
Quarter	0	1	2	3	4	Status	Notes
OLA						Underway	Waiting on Facil.
Maple Ridge						Not Started	
Corner Property						Not Started	

OLA Property – now "CARI" – Despite intentions of occupying the new facilities by the beginning of the 2008 – 2009 fiscal year, progress has been slow. Initial planning and review of infrastructure needs and deployment complete. Now waiting on Facilities. <<Project on hold waiting on facilities>>.

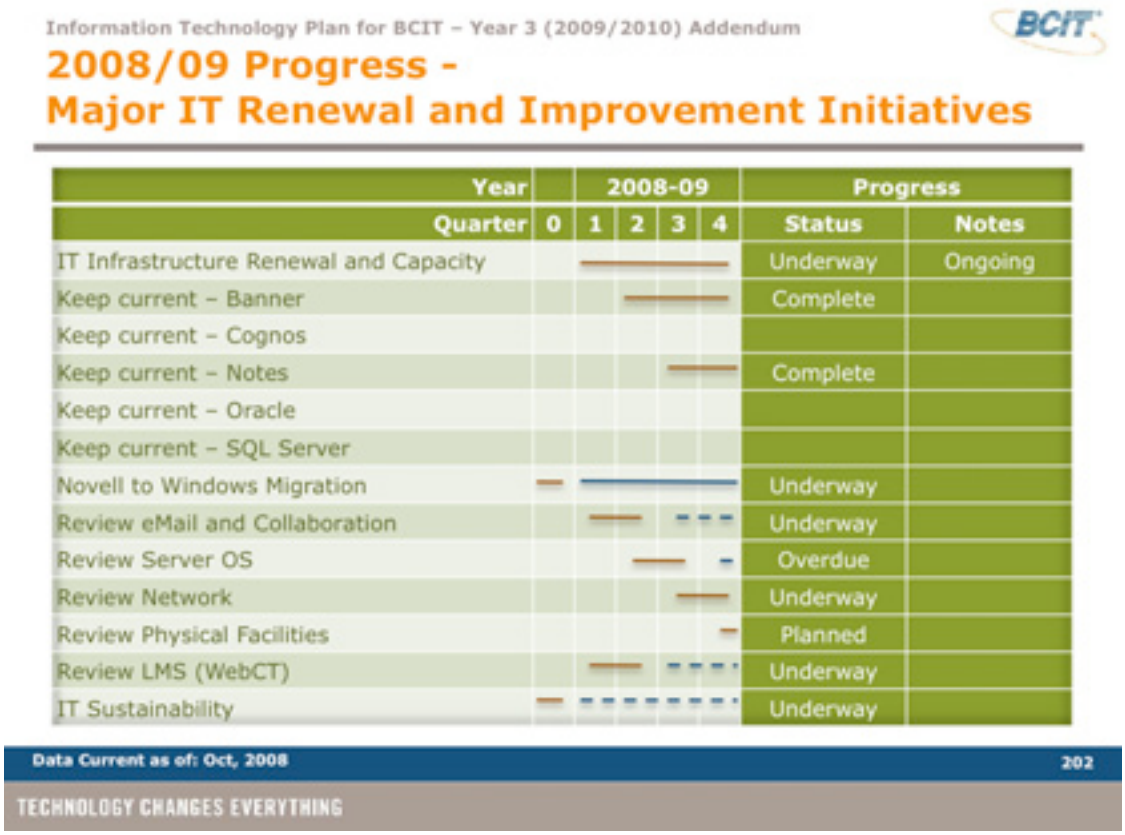
Maple Ridge Property - Original indications of the beginning of planning for the new Maple Ridge / Translink facility have been stalled. Waiting on facilities to indicate new timeline. <<Initiative is deferred to 2009 - 2010>>.

Corner Property – referred to as the Life Sciences Building. IT Services expected to be involved in early discussions on planning and intended use for the new corner property building during the 2008 – 2009 fiscal year. To date, no planning meetings or discussions have been intiated on the property. <<Initiative is deferred to 2009 - 2010>>.



ITIL Config Mgmt. – This project is underway as of September 2008 . <<Project progressing as planned>>.

PMBok PM Disciplines. – The PMO have an ongoing program and communication plan to continuously introduce and assimilate PMBoK practices and disciplines into the IT Services project management culture. This is an ongoing activity. <<Progressing as planned>>.



IT Infrastructure & Renewal. – There have been a number of infrastructure review and renewal projects approved and underway in IT Services. These include server replacements and additions, replacement expansion of some network edge gear, increased storage capacity, and the regular, annual desktop renewal program. <<Proceeding as planned. This is an ongoing activity each year>>.

Keep Banner Current. – The entire Banner ERP suite of products underwent a complete upgrade to version 7.5.x during the summer of 2008. The project was undertaken using an new accelerated process that planned for 3 months instead of the traditional 8 month project. It was completed successfully, and 2 and a half weeks earlier than the 3 month plan. <<Complete>>.

Keep Notes Current. – Planned for the 2008 – 2009 year was an upgrade to the client side of Lotus Notes for all users. This was planned an d executed successfully in the first quarter of the 2008 – 2009 fiscal year. <<Complete>>.

Novell to Windows Migration. – This project is currently underway. It is behind the original planned schedule due to the need for further analysis and recommendations for the new Windows Archticture planning. This is now complete and the project is progressing. There are a number of other projects (eg. Citrix Lab Provisioning, Sharepoint, etc) that are dependent on an early activity in this initiative to deploy an Institutional Active Directory. <<< Underway >>>.

Review eMail & Collaboration – This project was refined to be "Review eMail and Calendaring" once a decision was made to move forward with Sharepoint as the primary collaboration tool. This project is underway and is expected to deliver a recommendation in time for any implications to the 2009 – 2010 Operational & Budget Planning year.

Review Server OS - ??????

Review Network – This initiative has been refocused as a "10 Year Plan for Network Resiliency" and was started in Q2 of 2008. <<<Underway. This could result in a series of sub projects after initial review.>>>

Review Physical Facilities. - ?????

Review LMS (WebCT) – The review of our current LMS environment is complete and the recoemmendation to move to D2L (Desire 2 Learn) has been approved. This has resulted in a new initiative to implement a hosted version of D2L. That project is currently underway. <<< Underway>>>.

2009 – 2012 Updated Roadmap Activities

- Business Initiatives
- Facilities Support Initiatives
- IT Renewal and Improvement Initiatives

Major Road Map Activities

HR Management Tool: Online data mart containing all relevant HR data organized and accessible by BCIT academic and business units with appropriate aggregation and security

Regularization Processes Improvements: Business process improvements and associated system automation changes and reporting capabilities to manage the auxiliary and temporary workforce that meet criteria to 'regularize' into full time employees

Seniority Automation: Business process improvements and associated system automation changes and reporting capabilities to calculate and report on the seniority status of all employees, including auxiliary staff

Workforce & Succession Planning: Detailed system specifications and proposed business processes that can subsequently be implemented to realize an effective and efficient Workforce & Succession Planning environment

Enrolment Management: Investigation of a software solution that will complement and integrate with our Banner ERP to engage and manage the pipeline for student recruitment and retention.

Financial Reporting and Asset Management: These are activities that will see the implementation of the recommendations from the Budget and Ops Planning Task Force, as well as a solution to properly manage all physical assets at BCIT so as to be in compliance with the Audit requirements.

Major Road Map Activities

Year	2009 - 10				2010-11				2011 - 12			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Other Business Applications	◆											◆
1 – SharePoint – Initial Production Deployment		—	—	—								
2 - Document Management			—				—				—	
3 - Implement D2L LMS System	—	—										
4 – BAS Small Project Work	—	—	—	—	—	—	—	—	—	—	—	—
5 – Online Purchase Requisitions		—	—									
6 - Contract Management Systems (details to be determined)												
7 – New Enterprise Financial Aid System							—	—	—			

Sharepoint: Sharepoint is a facility offered by Microsoft to meet the needs of collaboration spaces and repositories.

Document Management: The activites identified here represent individual deployments of the enterprise level document imaging and management system into specific business and/or academic units across campus. This implies a new implementation into a new organizational unit in each of the planning years.

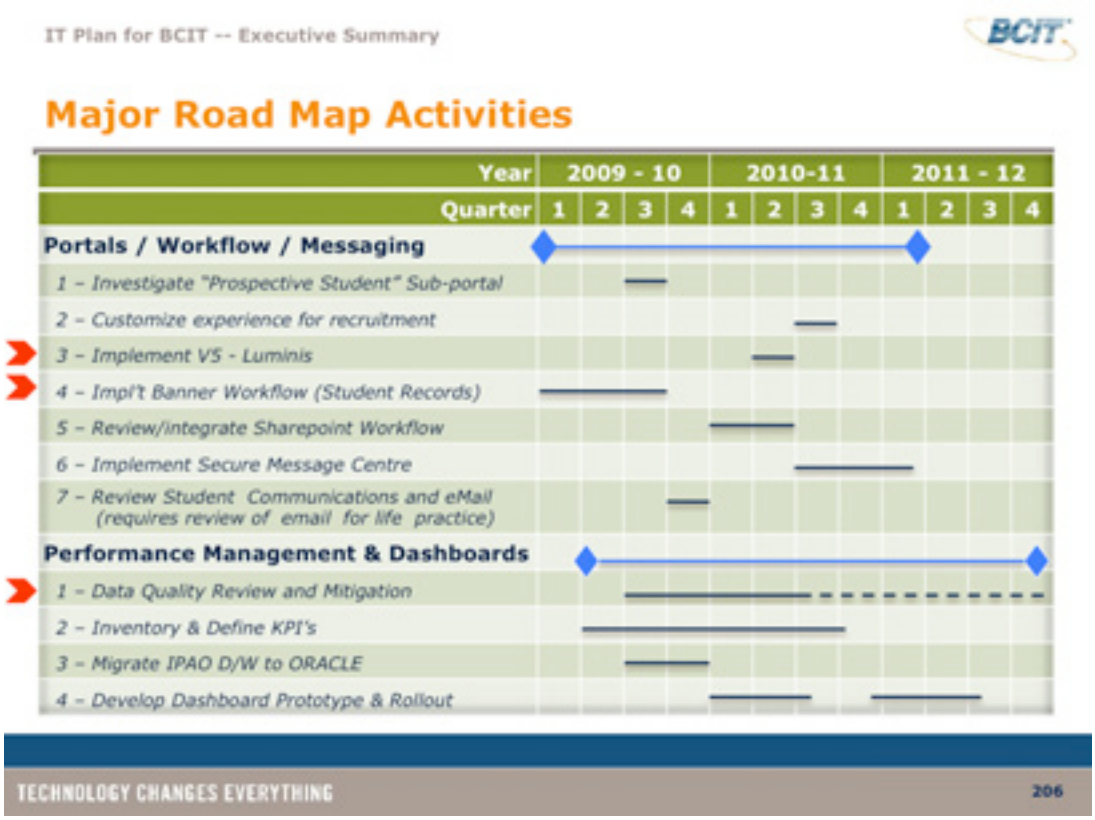
Implement D2L: Desire 2 Learn (D2L) is BCIT's chosen online Learning Management Solution. All online courses will be migrated to D2L and new course offerings will be provisioned using this facility.

BAS Small Project Work: This represents an ongoing demand for operational changes and enhancements to the Application Portfolio currently managed by Business and Application Services (BAS) within IT Services.

Online Purchase Requisitions: This will see the implementation of an online system to initiate, track, and process purchase requisitions from the originator's office through to purchasing and supply management.

Contract Management Systems: to be defined still.

New Enterprise F/Aid System: BCIT intends to participate in a local (BC based) consortium to provide the applications and support to automate the Financial Aid processes and functions.



Prospective Student Sub-Portal: Investigating the design of a customized portal experience for Prospective Students to increase engagement and conversion to applicants/students

Customize experience for Recruitment: Implementing the design criteria and functionality identified in the investigation above.

Implement V5 of Luminis: This will introduce a whole new technology and richness to the myBCIT environment and allow BCIT to exploit many new ways of communicating and engaging its community

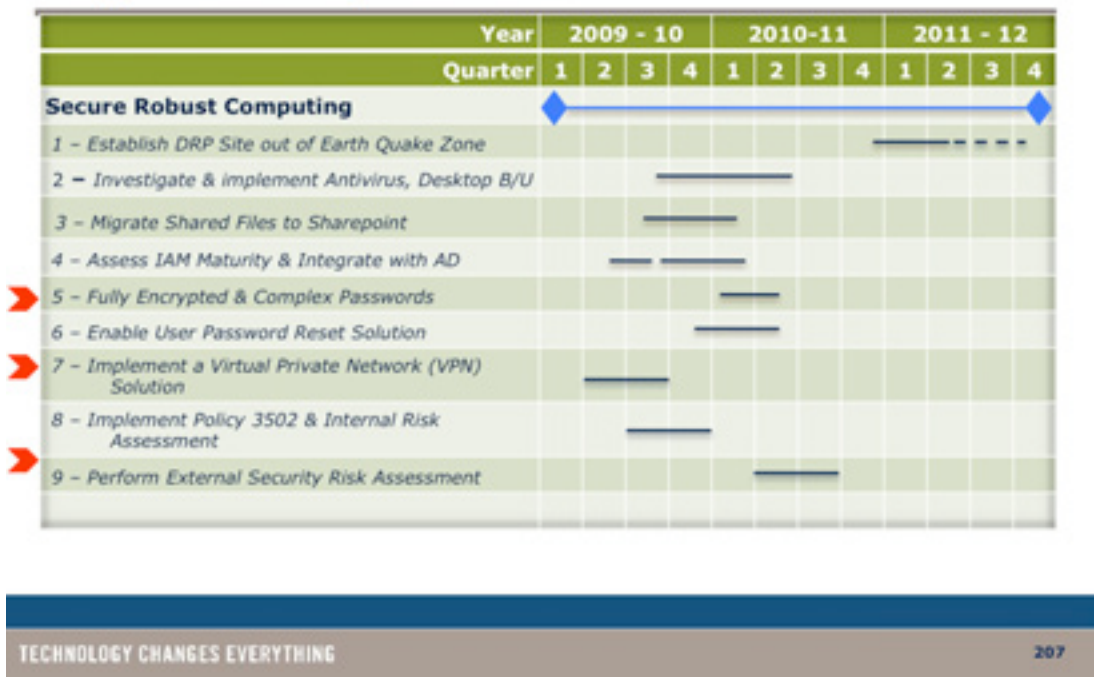
Implement Banner Workflow (Student Records): This will allow for automation and tracking of workflow activities through a web based interface – leveraging the improved processes and document management capabilities the RO has undertaken. It will also become the foundation for moving this capability out through the organization.

Review / integrate Sharepoint Workflow: With Sharepoint emerging as a collaboration space, and given it has its own version of workflow, we want to try to aggregate all workflow interaction into a single interface to simplify the experience for the end user.

Implement Secure Message Centre: This will become a secured repository for communications pay-loads that the BCIT community can access through the myBCIT interface. This is consistent with policy 3502 (Information Security) and best practices of large organizations.

Review use of Student eMail: This will explore the current use and future need for provisioning student email. Many post secondary organizations have abandoned this service as it is redundant. Most students today already have an email account, and if we move to a Secure Message Centre approach, we have assurance that the recipient can access the critical communications. This will also involve a re-inspection of the email-for-life philosophy

Performance Management & Dashboards: This is a series of activities that are in direct support of the 5Forward Strategic Plan and consistent with the direction for greater accountability and measurement of KPI's.



Establish DRP site outside of Earthquake Zone: While significant progress has been made around Disaster Recovery Planning and Business Resumption with the implementation of the DTC data centre, there was an original commitment to look at establishing another DRP site beyond the boundary of the lower mainland. There are potential opportunities in Kamploops, as well as potentially partnering with BCNet as they implement a second site outside the lower mainland catchment.

Antivirus & Desktop Backup: In order to ensure the IT environments we all depend on are safe, secure and robust, it is important to provide the tools and services necessary to protect the integrity of the data and systems we rely on, as well as a granular level of back up and restore capabilities for individual clients.

Migrate Share Files to Sharepoint: Using Sharepoint as a means to store shared files provides a secure repository that can be accessed from any location over a secured web based interface.

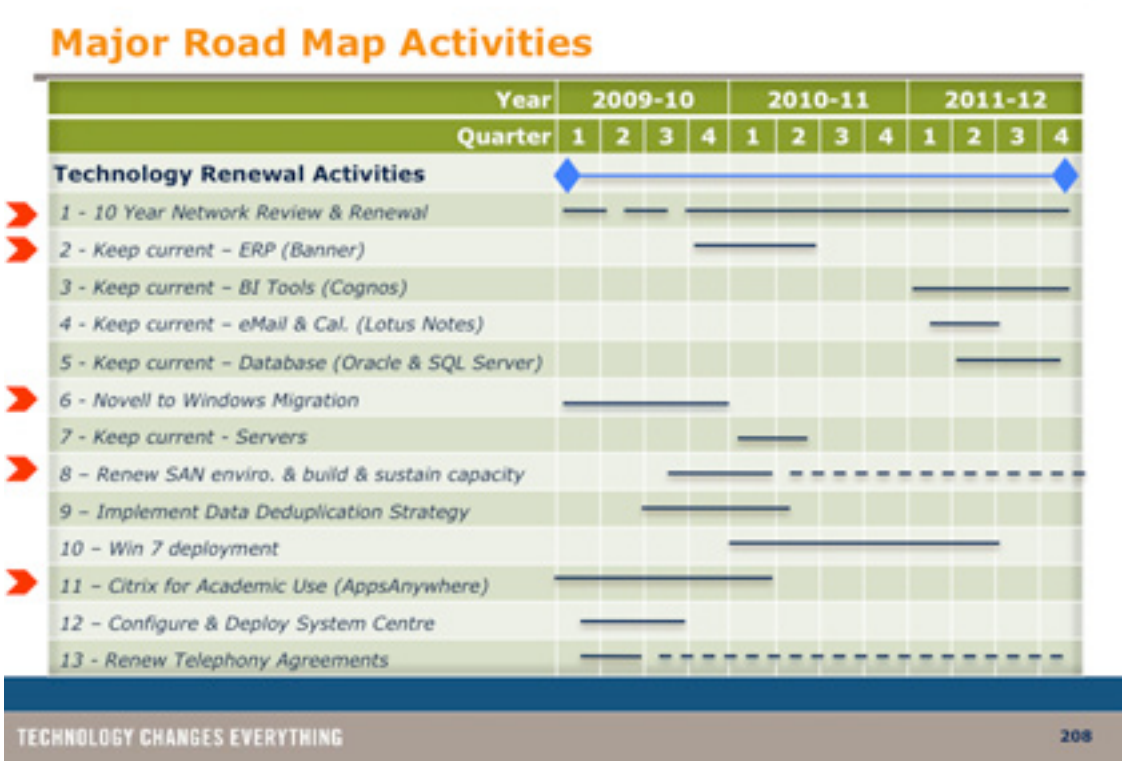
Assess IAM Maturity and Integrate with AD: With the completion of the migration from Novell to Microsoft as the underlying network software, Information and Access can be associated with the robust directory structure called Active Directory that is enabled in the Microsoft environment.

Fully Encrypted & Complex Passwords: In order to ensure the security of the online environment, and to fully comply with Policy 3502 and security best practices, all passwords and data communications need to be fully encrypted upon transmission across the wireless and wired networks.

Enable User Password Reset: Provides a secure and authenticated facility to allow clients to self-serve password resets rather than having to contact and involve the IT Service Desk.

Implement a Virtual Private Network(VPN): To further secure the transmission of institutional data and information when accessing systems and services when not directly connected to BCIT's wired network service, the implementation of a secured VPN that will authenticate the user and provide a secured and encrypted communications channel.

Implement Policy 3502: This will result in the current year with an internal risk assessment of our compliance with the new policy, including remediation recommendations for any non-compliance. The next year will see an external risk assessment of our compliance to this policy, again, identifying any remediation recommendations.



Technology Renewals: As various components of technology reach their end of useful life cycle, it is incumbent upon the Institute and IT Services to determine if that technology needs replacing, and if it does, to plan and execute projects that will ensure that we have a safe, robust, and reliable infrastructure upon which to enable teaching, learning, research, and the business of BCIT.

Some particular areas to note:

• **10 Year Network Review and Renewal:** The IT network at BCIT can be thought of as a set of interconnected central nervous systems that manage all of the traffic control and communication across the wires. The core network requires updating to increase capacity, deliver new and higher level functionality, and to replace aging equipment. The edge network is old and requires updating in order to assure reliability and compatibility with the new core.

• **Keep ERP (Banner) Current:** The Banner ERP System (Student, HR, Finance & Supply Management) and it's associated functions such as the myBCIT Portal is used to manage this entire enteprise. It is used to enroll, track, grade, and matriculate thousands of students a year. It is used to manage a $230+ Million business. It is used to hire, support, and pay nearly 2,500 employees. Additionally, the vendor of Banner (Sungard Higher Education – SGHE) are re-architecting their applications to take advantage of richer interfaces and deliver new functionality. BCIT has over the years made a significant investment in people, infrastructure, software, and training related to Banner. It is incumbent upon us to ensure we are leveraging that investment to be sure to maximize our ability to exploit the richness and functionality by remaining current with the vendor's release of new versions.

• **Novell to Window Migration:** This project will see the elimination of the Novell Network for services such as file sharing and storage, printing, etc. Moving to Microsoft for these services continues to place BCIT closer to the employers environments that hire our students, as well as reduces risk as Novell becomes less and less viable as a company – loosing market share rapidly, and allows BCIT to leverage other standard and functionally rich Microsoft capabilities.

• **Desktop OS's & AppsAnywhereccccccccccc:** In order to keep current with our licensing models, and equally as important, to ensure that we are providing an applied technology environment for teaching and learning that matches our employers standards and needs, we need to continue to roll out in a measured and controlled way, current desktop operating systems to the approximately 5,000 end devices that are centrally controlled. This also includes a new method of deploying software and applications for academic use (AppsAnywhere) that increases flexibility of scheduling fixed computer labs, and significantly increases student access to the software they use in those labs.

Technology Reviews: As part of the Technology Plan for BCIT and aligned with the goal to ensure that our IT assets remain current and relevant for the BCIT community, IT Services regularly reviews the current market state and usage of the various technology components and domains it is responsible for. By systematically working through all of the various services, infrastructure, technology, and applications, the Institute and be confident that we are invested and/or investing in the most appropriate technology available to us.

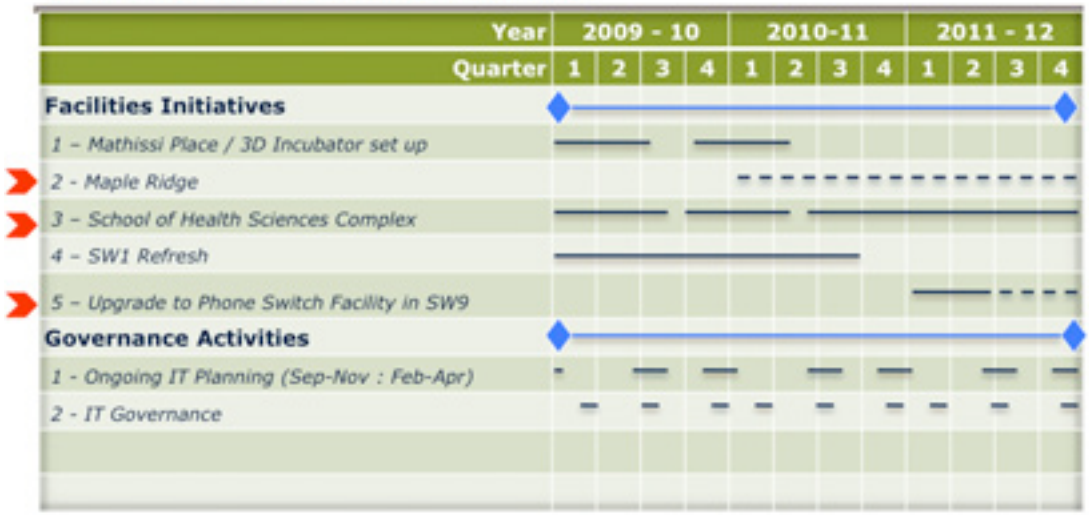
Of particular note are:

Review Telephony Procurement Strategy: The current agreement with Bell as BCIT's provider for land based telephony is expiring this fiscal year. BCIT can extend the Bell agreement (at its option) or we can go out to tender with a Request for Proposal to identify new opportunities, either with alternate carriers, and/or through Bell offering new services and pricing structures in a competitive process.

Review of Web Content Management Systems: BCIT has been using a "Software as a Service" model with a company called Marqui for authoring and promoting web content to the Public Web site. Marqui became an issue last year when it nearly went bankrupt and BCIT was scrambling to find a means of ensuring the persistence of our public web environment. The company did pull through at the end and we are still using it to manage our web content, but it would be prudent to review our options and ensure we are in a supportable, and sustainable environment for this critical service.

Review of Business Intelligence Tools: For just over 5 years, BCIT has known that our vendor (Cognos/ IBM) has declared that support for its current Business Intelligence suite of tools (Cognos V7.x) was scheduled to end in 2012. Timing to review our needs and market opportunities, including licensing the vendor's new environment (Cognos V8.x) is becoming critical. The timing is good given the Strategic Plan focus on performance measurements and KPI's/Dashboards as these capabilities are more often built into or extensions of Business Intelligence suites.

Major Road Map Activities



Mathissi Place / 3D Incubator set up: These are the activities necessary to extend our network and infrastructure into Mathissi place to provide connectivity and IT support for BCIT staff that are now located there. It also includes the necessary activities and technology to realize the implementation of the 3D

Maple Ridge: The initial 3 Year Plan for Technology for BCIT identified potential facilities projects out in Maple Ridge on a piece of property that is co-located with a Translink facility. This has not come up again since, and is therefore deferred from the coming year.

School of Health Life Sciences Complex: BCIT has a vision for an state-of-the-art allied health life science complex to be located at the corner of Willingdon and Canada Way. There are 3 phases to the IT involvement in this project. The first phase (Q1 to Q3 in 2009/10) represents the visioning and conceptual design of a facility that will meet the teaching and learning needs of the Health Care curricula for decades to come. The second phase (Q4 2009/2010 to Q2 2010/2011) is the detailed design and planning phase. Phase 3 (Q3 2010/11 to 2013) is the build out, provisioning, and implementation phase.

SW1 Refresh: The activities focused on facilitating the technology needs of the Gateway project to re-invigorate and expand the SW1 building.

Upgrade to the Phone Switch facility in SW9: The facility that houses the main telephony switching equipment for BCIT is aging and represents a significant risk should there be a failure. This activity will look at improving the switching capacity and capabilities, as well as the physical plant issues related to the building and the fact that there is currently just a single access for all network cabling.

Establish DRP site outside of Earthquake Zone: While significant progress has been made around Disaster Recovery Planning and Business Resumption with the implementation of the DTC data centre, there was an original commitment to look at establishing another DRP site beyond the boundary of the lower mainland. There are potential opportunities in Kamploops, as well as potentially partnering with BCNet as they implement a second site outside the lower mainland catchment.

Ongoing IT Planning: development and preparation of the annual update to the 3 year IT Plan for BCIT is a recurring activity that is scheduled into the January to March timeframe each year. Additionally, taking the outcome of that planning activity and using it to influence annual operating and budget plans is a recurring activity that is scheduled into the August to November timeframe each year

IT Governance: This represents the activities of the IT Steering Committee related to providing guidance and decisions related to major IT investment activities. June meetings will focus on the delivery of IT Planning updates. September meeting will focus on guidance in the development of operational and capital plans and budgets. March meetings will be opportunities to review accomplishments and influence annual IT Strategic Planning directions.

Next Steps

Next Steps

- Take 0809 budget impacts forward as part of the current budget / operations plan process – Dec 31st
  - Initiatives requiring new funding will have to compete for the "3% claw back" money
- Execute Communications Plan – Mar 31st
- Establish IT Governance Structure – Mar 31st
- Where required build business cases for Roadmap initiatives and take through Governance – Mar 31st
- 09 Update of Plan – Jun 30th