Planning for Change: Engaging with HMC's mission

Harvey Mudd College Information Technology Strategy

Draft 0.9

This is a "beta" version of the document, deliberately released in an incomplete state
in order to solicit feedback and contributions from the HMC community.
You can help improve it.

http://www5.hmc.edu/ITPlanning/plans.html

Introduction

This document provides an overview of the main elements of an Information Technology strategy for Harvey Mudd College.

Strategic planning takes an institutional point of view and is therefore not focused on the Department of Computing and Information Services alone.

Earlier drafts of this document went into detail about operational issues in many areas. The current version represents a different approach. Information technology planning can be broken into four categories:

- Strategic planning
- Tactical planning
- Unit and project planning
- Team and individual work planning

This document is an instance of the first kind of planning. It is intended to give an overall direction with a set of overarching goals, but not dictate the steps required to reach the goals. The other three types of planning are ongoing, more detailed, and often modified to reflect new developments or the results of previous steps. Detailed planning will be documented as we develop tactical initiatives that carry forward the strategy.

Over the past year, it has emerged that there are four core areas that HMC's IT strategy needs to address:

- Information Technology Governance at HMC
- Information Technology Infrastructure at HMC
- The central IT organization at HMC (Computing and Information Services)
- Innovation in IT at HMC

These areas are interdependent and in each of them HMC faces significant challenges. As the 2007 IT Review pointed out:

> Notwithstanding its small size - as measured in student enrolment, for instance - Harvey Mudd College is a complicated institution with widely varied needs and expectations for information technology in teaching, learning, research and administration. HMC faces a sea change that all higher education is trying to cope with: all our core missions are inextricably tied up with the use of information technologies. This means that envisioning and supporting the resulting IT ecology requires more attention, resources, planning, and communication than "academic computing" and "administrative computing" did a decade ago.

And the reviewers went on to write:

> It will take the commitment, thoughts, and contributions of the entire institution to achieve. We don't mean this as a platitude. We are quite serious that IT excellence in higher education, especially for an institution of HMC's size and quality, is not a solved problem[1].

---

1 Tedd Dodds and Joel Smith, Harvey Mudd College IT Review, July 2007 See
   http://www5.hmc.edu/ITReview/2008/06/24/executive-summary/

This strategy document and the other kinds of planning that flow from it, which are already well under way, are intended to represent a path toward IT excellence for Harvey Mudd College.

1. Information Technology Governance at HMC

HMC's strategic vision of "unsurpassed excellence...at all levels" calls for constant improvement. Such improvement requires constant innovation and decision making. Information Technology decision making is inextricably entwined with every other aspect of HMC. The college needs a strong IT governance model or "structure and process of authoritative decision making across issues that are significant for external as well as internal stakeholders"[2].

The current governance model for IT at Harvey Mudd College is focused almost exclusively on the Computing and Information Services Department. The CIO, who is a Vice-President and member of the Cabinet, is tasked with management of the CIS department, and is advised by the Computing Committee, which consists of three faculty members and a student. The Cabinet provides guidance on major IT issues. Some aspects of IT governance are handled at the consortial level, by committees like the ITC and the Sakai Administration Team.

Many (most?) decisions about IT are about an infrastructure that affects everyone in the HMC community almost all the time and is the foundation of the organization's IT capabilities. It is therefore vital that the college develop a governance model that can capture the concerns of the different constituencies in the community (students, faculty, staff, alumni, trustees …), can guide CIS, and be flexible and responsive to changing needs and a changing IT environment.

Decisions about information technology that have significant campus impact are currently made at different places in the organization, with varying levels of consultation with clients and stakeholders, and varying levels of consideration of impact. Examples include:

● within CIS (for example, the decision to acquire Zimbra as an email application or the annual decision as to what software should go on lab computer images)
● at the level of the Claremont Colleges Consortium (for example, the decision to deploy Jenzabar CX, decisions about wireless technology or the choice of Footprints as an IT trouble ticket system)
● within HMC departments (for example, the choice within F&M to adopt EMS for event management; the choice within HR to adopt the ADP timekeeping system; the choice within Computer Science of an alternative to Postini for spam filtering; software support decisions within the Math Department; the decision with Admissions to use Recruitment Plus).

It is quite common for IT decisions to be made at lots of different points in an organization. It can also be challenging for the institution to coordinate IT decision making in order to develop a coherent and integrated set of technical choices for the organization. Lack of coordination can lead to fractured support of systems, limited levels of knowledge about particular systems, lack of use of features that could improve people's working lives. All of these can prevent an organization from reaching its goals effectively.

---

2 Gayle, Tewarie, & White, Governance in the twenty-first-century university: Approaches to effective leadership and strategic management. 2003.

HMC does not have a formal process for the development of policies that cover information technology. What policies there are have mainly been produced within CIS, although some, such as the acceptable use policy, or the copyright policies, are Claremont wide. There are lacunae in policy areas such as data access and classification, data retention and web policies. So the college needs a framework that will ensure that policies are vetted by the appropriate constellation of committees and stakeholders.

HMC needs to address these challenges of IT governance and decide how it will control and coordinate IT decision making.

IT Governance Strategies:

1. Develop, deploy and optimize an IT governance model for the College
2. Ensure that all stakeholders understand and use the IT governance model appropriately

2. Information Technology Infrastructure at HMC

Since information technology is ubiquitous,a good computing infrastructure is a prerequisite for achieving the college's goals in all other areas. At Harvey Mudd College the information technology infrastructure has suffered from uneven investment and a lack of long term planning. The 2007 IT review identified this issue: "[The College] has invested unevenly in its IT infrastructure over the years, e.g. assuring regular replacement of faculty desktop computers but dedicating no significant funding to central machine room facilities or departmental computer labs for teaching".

If we take infrastructure to mean the full collection of hardware and software tools that the college uses, then there is need for work in many areas. At the most basic level, there is work to be done on physical conduit for fiber, on the wired and wireless networks and on the collection of servers the college owns. There is work to be done on integrating the large number of critical applications that are used every day to get our work done. And there is a need for work in areas of IT infrastructure such as identity management, data stewardship and security. Most of these infrastructure areas cannot be addressed in isolation from governance issues.

Let us take the issue of identity management as an example. "Identity Management" refers to the systems and procedures for managing information about people and, sometimes, machines or equipment. It is usually associated with authentication and authorization systems, but can provide the foundation for much more, such as preferences management and automated role based work flow. Identity management initiatives usually involve developing policies that identify which data will be regarded as the source data, stewardship responsibilities and data access rights. With a robust identity management arrangement, one can move on to true single sign on, improved online privacy and reliable directory information.

Like many colleges, HMC faces challenges in all of these areas. As an example, something like the following is the current scenario. Much student identity data is stored in the Jenzabar CX system; some staff and faculty data is also stored in CX (for mailings etc); employee data is stored in ADP (faculty, staff, working students) with some duplication of the information in CX; some student identity data is stored in the portal; photographs (a form of identity data) are stored in several places; usernames (another form of identity data) are multiple and vary with application or service (eg file storage vs email); some data relevant to student identity is stored in Sakai (non-final grades, for example); some data relevant to faculty and staff identity is also stored in Sakai, as well as in the Blackboard card system. On the information delivery side (both general public and on-campus directories), the LDAP based online directory is not regularly maintained and there is little understanding and no agreement about stewardship roles with respect to directory information. There are no formal agreements for any of these systems regarding critical questions like the following: which data fields should be regarded as the canonical source of information? What are the stewardship responsibilities and in what part of the college do they lie? How should access be provided (both a political and technical question)? What are our standards for securing data?

As another example, consider information security, an area in which the interlocking of governance and infrastructure is very clear. Information Security has become a more pressing issue in recent years; it was ranked as the #1, #2 and #3 issue in the Educause Top Ten IT issues survey for 2007, 2008, and 2009 respectively. And of course there are a number of legal mandates, such as California's SB1386 and FERPA, that bear on security too. Although the focus is often on technology, it is important to look at the how people behave with respect to sensitive data, whether it is stored electronically or on paper. Harvey Mudd College needs coherent policies and practices regarding information security, guidelines for security settings for equipment and formal policies about access to sensitive data. These in turn affect the design of the IT infrastructure.

Identity management, data stewardship and security are only three of the important areas of IT infrastructure that the College needs to begin addressing. Others include sustainability, the potential use of Software as a Service (SaaS) models for critical business activities, disaster recovery plans, long term network plans and research computing needs. They all need to be addressed in an iterative and sustained manner.

Few of these issues can be addressed by CIS alone, nor can they be viewed in isolation as "IT problems", since all imply questions that cut across functional areas. An IT governance model is therefore a necessity for developing an infrastructure plan.

Information Technology Infrastructure Strategies:

1. Develop long range IT infrastructure management plans for every level: physical infrastructure, network, servers, classroom equipment, and end user devices.
2. Develop a technology roadmap for the College that will allow it to address issues such as identity management, data stewardship, single sign-on, security and sustainable IT.
3. Design an IT infrastructure that balances appropriately between security and allowance for innovation and experimentation.

3. Computing and Information services, the central IT organization at HMC

The Computing and Information Services department (CIS) has historically been the main vehicle for institutional investment in information technology, and the college's IT staff and resources are concentrated in this central unit. The department is currently organized in six areas: Administrative Services, Data Services/Software Engineering, Network and Systems Group, User Support Group, Educational Technology and Media Services, Special Projects[3].

The 2007 IT review identified a number of areas of concern for CIS, and especially the need for CIS to develop a more robust service culture. In general, central IT services need to be well aligned with the College's mission and vision; likewise the college must ensure that CIS is managing an optimal catalog of services, including the right mix between services that are directly provided and services that are provided through "alternative sourcing[4]". In the case of HMC, alternative sources could include the Claremont Consortium and other colleges as well as the full range of other sources, from traditional outsourcing to cloud computing.

The CIS department faces a daunting array of challenges. They range from deploying and supporting a robust IT infrastructure to providing excellent user support and services; from understanding the academic goals of individual instructors to sharing a common sense of purpose with the the Office of College Advancement or Facilities and Maintenance; and from managing the Claremont Colleges commercial internet connections to supporting student computing projects. The department can rise to these challenges, but not in isolation from the rest of the college and consortium, and not without strong governance models and a set of infrastructure decisions that set priorities.

CIS has already embarked on a number of initiatives designed to enhance its organizational effectiveness and develop the skill sets needed to address the challenges it faces. It will take sustained long-term commitment to these initiatives to achieve the kind of excellence that is characteristic of HMC's efforts in so many other areas.

CIS Strategies:

1. Develop management practices and the overall capacity of CIS so that central IT services are reliable, client-centered, advancing the Mission of HMC and supporting education through innovative uses of technology.
2. Identify an optimal catalog of services to be provided by the central IT organization.
3. Identify service sourcing strategies, including full use of alternative sourcing, in order to maximize CIS's ability to deliver needed services.

---

3   See Appendix A for a current organization chart.
4   "Alternative Sourcing" is used to cover "the range of options that institutions have for providing technology services or operating technology functions aside from doing it themselves". See Philip J. Goldstein, *Alternative IT Sourcing Strategies: From the Campus to the Cloud"* Educause Center for Applied Research, September 2009. See http://www.educause.edu/Resources/AlternativeITSourcingStrategie/177700

4. Innovation in Information Technology at HMC

HMC's strategic vision principles aspire to "unsurpassed excellence...at every level". This requires innovation and continuous improvement at every level. What counts as innovation may vary from context to context so it is important not to conceive of it too narrowly. What is unremarkable in one context can be quite innovative in another. For example:

- A staff member begins using an electronic calendar to coordinate meetings where before numerous emails were required.
- A computer scientist begins to use a wiki to encourage students to collaborate to write lecture notes[5].
- An art historian transitions to using digital images instead of slides in her classes.
- A student develops and patents a piece of cryptology software.
- A team of students writes software for an online voting system for student elections.

As is clear from these examples, one can innovate using information technology and one can develop innovative information technology. Harvey Mudd College should do both.

Innovation can thrive when the institution enjoys good IT governance, good infrastructure and an agile and proactive central IT organization. When the central IT organization is providing a solid infrastructure and efficient services, IT resources can be freed up to support innovation. We also need understanding that innovation requires experimentation, scouts who are paying attention to the broader IT landscape and time...for faculty, students and staff.

Innovation Strategies:

1. Develop policies, programs and practices that foster and stimulate IT innovation throughout the college.
2. Recognize and reward innovation when and where ever it occurs.
3. Promote a culture of experimentation.
4. Engage with and contribute to the broader higher education IT community.

---

5   This example was provided by Professor Melissa O' Neill.