

THIS GOES WITH THIS GOES WITH THAT: MAXIMISING THE MODULAR APPROACH IN LIBRARY SYSTEMS

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ABSTRACT

Libraries for many years have been trying to make the information-seeking process easier and more convenient for users. USQ Library, with its high proportion of off-campus students, has felt this challenge more keenly than most. Over the last 18 months, the Library has implemented federated search, interlibrary loans and off-campus delivery through a single interface, branded "DocEx". This paper explores some of the key issues in the planning and implementation of this initiative: system interoperability, staff training, vendor relationships, client consultation, and other business and technical issues. The paper evaluates the impact of this initiative on the Library's service delivery.

1 INTRODUCTION

Man's mind, once stretched by a new idea, never regains its original dimensions. (Oliver Wendell Holmes)

It has become a cliché to say how much our world has changed in recent years, and how much more change is awaiting us. Change is usually thought of in relation to technology advances, and certainly in the information technology field, developments in the interoperability of systems, international standards, open source software, and user authentication and authorisation have opened up new possibilities in existing services and enabled the development of new services.

Libraries have frequently been early adopters of new technologies, quick to see the potential benefits for client access to information. In recent years, libraries have tackled web developments, in-house digital repositories, interactions with other institutional systems (eg student administration systems, learning management systems), not to mention managing the increasing volume and range of databases, e-journals and e-books. These technological advances have presented challenges to the way libraries have been structured, how workflows have been organised, how staff have been trained, and what type of staff have been recruited. They have also presented challenges to the way information resources have been made available and promoted to client groups.

Another cliché is that client expectations of service levels have risen in recent years. Libraries have traditionally had a strong client service ethos. One of the key challenges these days is to keep library resources and services relevant to clients in a changing environment. The pull of Google and its like is never far from the minds of librarians. Numerous recent surveys have indicated that students use the web more than traditional library sources to find information, a trend attributed to the ease and speed of web searching compared with the intricacies of library database searching. (Tenopir, 2003 & 2004). How can traditional library resources such as catalogues and academic journal databases remain relevant, valued sources of information?

2 DISCUSSION

2.1 WHAT WE ARE TRYING TO DO, AND WHY

They always say time changes things, but you actually have to change them yourself. (Andy Warhol *The Philosophy of Andy Warhol*)

Like most university libraries, USQ Library aims to provide the best possible resources and services for its clients. We have for some time pursued the “holy grail” of providing easy, quick access to those resources and services. We wanted to make available a system that was as simple and convenient as possible for clients, and that was flexible, reliable and efficient for Library staff.

USQ’s student profile presents a challenge for the Library in terms of student access to resources, service and resource delivery, and student support. USQ has a high proportion of off-campus students: almost 80% (20,000) of students study externally, with 30% (6,000) of those studying off-shore. Of the University’s off-campus students, 75% are over 25 years of age, and more than 50% live in rural or geographically isolated areas.

The Library has had a deliberate policy for a number of years of increasing the proportion of its full-text electronic resources so that off-campus students have the same access to resources as their on-campus counterparts. The Library now has approximately 65 databases, 19,600 full-text electronic journals and 13,400 e-books. In our pre-DocEx environment, increasing the number of resources available created other problems: making sure students were aware of the range and utility of available resources, advising them about which are the most relevant, and instructing them in their use.

In terms of resource delivery, the Library has traditionally provided a loan and photocopy delivery service to off-campus students. Postal delivery, particularly to isolated areas or overseas, was often slow. With the introduction of DocEx for off-campus requesting in 2004, the Library offered web delivery as an option for the first time.

In terms of student support, the Library offers an 1800 telephone number and email reference service. Some information literacy classes are held in Australian metropolitan and regional centres for off-campus students, but no such service is available for off-shore students. Online tutorials are made available on the Library’s website, but they are not well-used. Library staff have wanted electronic access systems that made it easy for students to find the information they needed without lengthy instruction on how to do it, ie a system as intuitive and easy as Google. Federated searching provides a major first step towards such a system.

In its planning for the DocEx initiatives, the Library has been mindful of integrating its work with the University’s broader e-learning agenda. The DocEx initiatives support USQ’s *Learning and Teaching Plan* (2004), particularly in the areas of creating and maintaining appropriate learning environments. One of the *Plan*’s goals is to provide a flexible and responsive learning environment, offering choice in modes of educational delivery to students. Other goals relate to providing inclusive and supportive environments based on quality learning resources and technologies. A specific strategy related to this goal is to further develop digital library facilities for access by all students. The DocEx initiatives, by extending and integrating access to both electronic resources and service requesting, directly support the University’s learning and teaching goals.

2.2 WHAT WE’VE DONE

The best way to predict the future is to invent it. (Alan Kay)

At the time of writing this paper, the achievements we hope to talk about at the conference are still in the planning and implementation stages. So in some ways, this section describes the system elements that we hope to bring to fruition in the early part of 2005.

At the beginning of 2004, USQ Library launched its DocEx service using the Fretwell-Downing ZPortal for end-user searching and requesting and VDX software at the back end for staff management of requests. Initially, our rollout of this system provided inter-campus loans and provision of scanned or photocopied documents for off-campus students only. Although VDX is primarily designed as an inter-library loan management system, USQ focused on its potential for delivery of scanned copies of resources to off-campus students (our area of greatest need). Full details of this first phase of implementation can be found in Lowe and Jeffries (2004).

DocEx functioned very successfully throughout 2004, with 794 active users placing 5,506 off-campus and 200 inter-campus requests. DocEx accounted for roughly 65% of requests received by Off-

Campus Services overall. Fifteen percent of students requested web delivery for scanned material rather than postal delivery. The success of the DocEx service only reflects a part of the potential of this new “strategic” system in USQ’s systems strategy. It was always seen as, and intended to be, Phase 1 of a rollout plan for the functionality offered by the system.

Phase 2 was planned for providing Inter-Library Loan (ILL) functionality for staff and on-campus postgraduate students, as well as brokering off-campus requests from postgraduates who were eligible for ILL.

Phase 3 evolved as we began to consider further applications of the functionality that ZPortal and VDX offered.

Like most academic libraries in late 2004, USQ was grappling with various solutions for federated searching. In mid-2004 Library management had to decide whether to continue with the AARLIN Project or to find a viable alternative. Various discussion papers later, it was decided to withdraw from AARLIN, primarily for financial reasons, and to contract Fretwell-Downing Informatics to supply the additional functionality for federated search and open linking within the ZPortal interface we were already using successfully for online and postal document delivery. This solution was seen to have a number of distinct advantages:

- we would not have to familiarize ourselves with a new product
- we would not have to manage another Help Desk service
- we already had an established and satisfactory relationship with the vendor
- it offered a high level of integration between searching electronic resources and ILL / document delivery
- minor changes to the interface already used for DocEx
- we knew that authentication using LDAP was working successfully in DocEx.

The main reasoning for this decision was to expand the services offered to our off-campus students through the same interface they were already using for document requests. With an increasing clientele and positive student feedback about the service, we believe this will be the best way of introducing the concept and benefits of federated search for some of our key electronic resources.

ZPortal search profiles can be set up to search both Z39.50 and non-Z39.50 but web-accessible resources. The latter can be searched using FDI’s Z2Web technology.

Faculty Librarians representing Arts, Business, Education, Engineering and Sciences were asked to prioritize the resources that would be most suitable for federated search. Their preliminary list included EBSCOHost, Informit databases, eBrary, Netlibrary, Emerald, Curriculum Exchange, Factiva, CCH Electronic Libraries, LexisNexis Butterworths, IEEE, ASCE, COMPENDEX, OVID, PSYCINFO and SCIENCE DIRECT.

In October 2004, the Library’s Electronic Resources Officer configured the test instance of ZPortal to include search profiles for two main resources, EBSCOhost and Ovid. This gave us a basic but sufficient example to demonstrate internally in order to promote the solution. A steering committee was established, with representatives from Information Services, Cataloguing, Client Services and Systems. This committee met only sporadically through the end of 2004, with fortnightly meetings planned from the start of 2005.

The following screens show the addition of electronic resources to the list of available search profiles. These search profiles display to the user upon login. The screen captures have been taken from the USQ test system and represent the vanilla installation of ZPortal. USQ has cosmetically modified its production system to compliment our website / CMS look and feel.

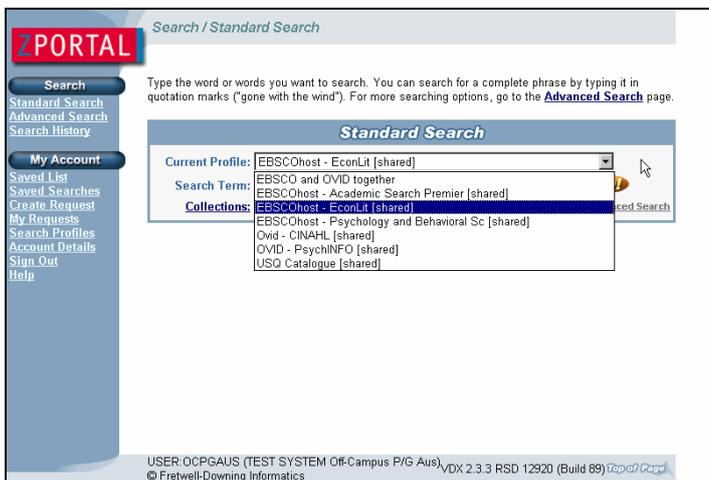


Figure 1: Drop down box showing search profiles available to user on login

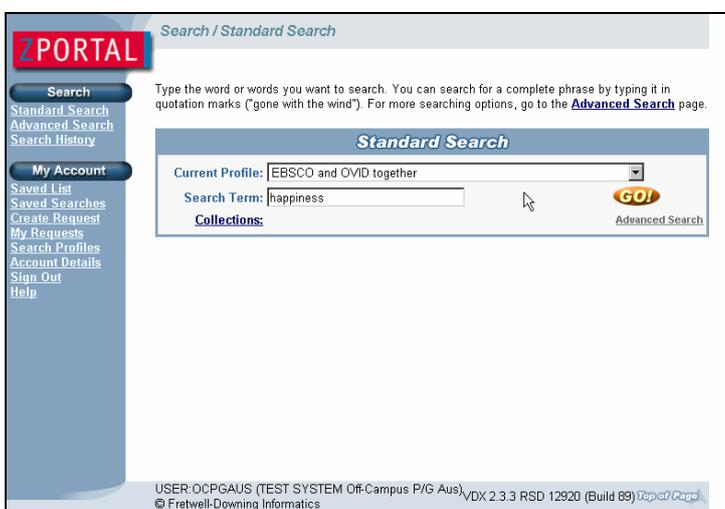


Figure 2: Combined EBSCO and OVID profile selected, search term “happiness”



Figure 3: Search results screen. Links to full text (HTTP icon) and option to request via ILL (“Get It”)

With the high level of integration between the ILL functionality and federated search, eligible users are able to retrieve the full text instantly or place a request for an ILL if full text is not available.

Again, our strategy for implementing the new functionality was to break it down into manageable milestones. Our plan has been to roll out search access to a small number of highly significant resources, upon which we can build as our users' experience develops. This service will become even more valuable when we implement open linking, broadening our users' access to full text immediately online.

In late November 2004, we have had to consider the implications of the beta Google Scholar search interface (<http://scholar.google.com>) and whether or not this should affect our plans to roll out federated searching through DocEx.

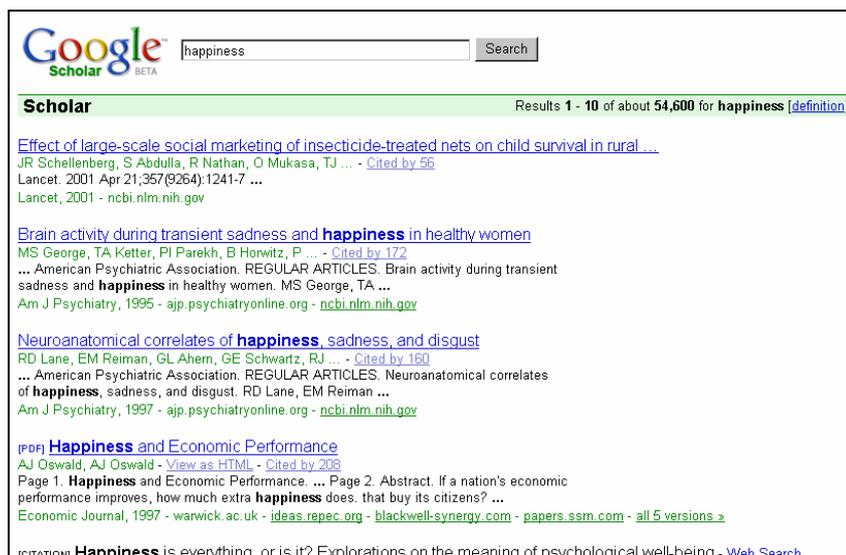


Figure 4: Google Scholar search results, PDFs marked

Google Scholar offers a number of distinct benefits: open linking is available and other significant pilot projects such as Cross Ref (<http://www.crossref.org/crossrefsearch.html>) and Open WorldCat (<http://www.oclc.org/worldcat/open/default.htm>) are incorporated. While the latter has limited benefit to a regional university library in Australia, they are features that may develop in the future in such a way that we can take advantage of them.

With Google Scholar in its infancy and uncertainty about features such as integration with EZProxy and access for off-campus users (Pival, 2004), USQ made the decision to pursue the solution already underway in the expansion of DocEx to include federated search. One of our concerns about adding the functionality to the existing system was that it did not offer a solution to our on-campus users, although this could certainly be configured and would be addressed at a later point. One of the advantages of using the VDX product is that it enables us to very specifically tailor services to select groups of users.

With configurations already in place for our off-campus students, it will be a very simple matter of adding the search targets to the "User Location Defaults". Concurrently with the federated search project, the Systems Librarian and Off-Campus Services Coordinator were working on the necessary configurations to implement full inter-library loan functionality. Part of the configurations for ILL includes adding staff records to the system and once this is done, their "User Location Defaults" can also easily be set up to access the search profiles created for electronic resources in addition to the catalogue. USQ's user population consists of three fairly distinct groups of users with particular needs, primarily consisting of off-campus users, in addition to staff and on-campus students. With a few simple configurations, we would be able to offer federated search to the first two categories of user. Google Scholar, rather than complicating our strategy, was seen as potentially offering part of the solution for our third group, the on-campus student users.

Best of all, the DocEx solution provides seamless integration between searching of our Library catalogue and electronic resources and inter-library loan and document delivery options for our end users. With the ability to provide links to web pages outside of the system, DocEx seems to be rapidly emerging as our new “one stop shop”, targeting our off-campus users particularly.

2.3 CHALLENGES WE FACED, AND HOW WE ADDRESSED THEM

Good ideas are not adopted automatically. They must be driven into practice with courageous patience. (Hyman Rickover)

Staff acceptance of the new system, at least initially, was hampered by some of the problems mentioned below (particularly initial interoperability difficulties). Planned training in Phase 1 (off-campus requesting) had to be postponed and the section coordinator spent considerable energy in maintaining the spirits of staff who already had anxieties about the new system. Once training sessions were held, workflow changes worked through, and “quiet time” was made available for practising with the system, staff felt more comfortable. Within three months, all staff were competent in basic operations. A particular highlight of the new system in Phase 1 was the document scanning process, considered by staff to be more “fun” than photocopying documents. Follow-up training focussed on developing greater troubleshooting skills. Training for Phases 2 and 3 was able to build on a solid platform of basic system understanding.

The overall staff impact has been positive. Staff feel, justifiably, that they tackled a challenge with flexibility and creativity, developed new skills, and improved client service. Having succeeded in Phase 1, there was much greater confidence about moving on to the next stages.

The success of Phase 1 and implementation of Phases 2 and 3 simply could not have been possible without a close working relationship between Systems and Off-Campus Services staff. Both sides agree that neither one could have accomplished successful implementation without each other's dedication and input to the process. We have also been incredibly lucky to have had the unfailing support and dedication of our ITS team, whose DBAs have applied exceptional trouble-shooting skills on a number of occasions. Our ITS team has also proactively resolved at least two situations where we had made oversights in our initial setup that were not straightforward to resolve without assistance. These related to a load of all NLA KDD Locations and the turning-on of a Document Deleter program in our production system. Without these issues being resolved, we would not have been able to proceed beyond Phase 1 and would soon have found our capacity to use the system diminished from system resource issues.

The biggest challenge has been the level of interoperability between this system and our legacy Library systems, particularly the Library catalogue (Virtua) and electronic resources. We have found ourselves in a new world, where the maintenance of search indexes on Virtua can dramatically affect response times in VDX and where a system upgrade on one system dramatically affects our service provision through another. The indexing issue was our first major hurdle in interoperability and took a week to isolate and resolve when we were planning to train our staff. The two major instances of upgrade impact occurred in late 2004 when we moved our Virtua system to a new hardware platform and then upgraded it to Oracle 9 and a new release of database a few weeks later. The hardware change particularly, which occurred on a weekend, meant that the ZPortal search profile was not able to connect with Virtua until the settings on VDX had been updated. It is obvious to us that when Virtua is offline for backup or upgrades, DocEx cannot offer catalogue searching, but how do we explain that to our users?

In November, a number of unrelated technical glitches affected our ability to process documents. In this case, within a 24 hour period we had a power blackout caused by a storm which corrupted our Ariel software, new virus scanning software rolled out automatically by ITS which shut off our Ariel email, and rollback segment problems on the Oracle database. When dealing with systems that are closely tied to one another, troubleshooting can become an intricate and challenging maze of problems and solutions.

Another big challenge, not only for the Systems team but for all Library staff, is to mask the underlying complexity of our systems when it comes to the interfaces we present to our users.

During 2004, the Systems Librarian developed a detailed spreadsheet of the range of Library systems that were being supported and developed, mainly to assess the viability of migrating systems to common platforms when the time came to replace hardware. The spreadsheet detailed supported platforms for all systems, vendor recommendations in terms of hardware sizing and configuration and timeframes for system hardware replacement. Elements of this information were transferred to a diagram format which could more easily be explained to both Library management and senior management of ITS.

It is helpful to refer to the diagram as part of our ongoing planning and strategy development, looking for efficiencies in the model as well as determining impacts across and between systems where co-dependence is an issue.

USQ Library Systems, September 2004

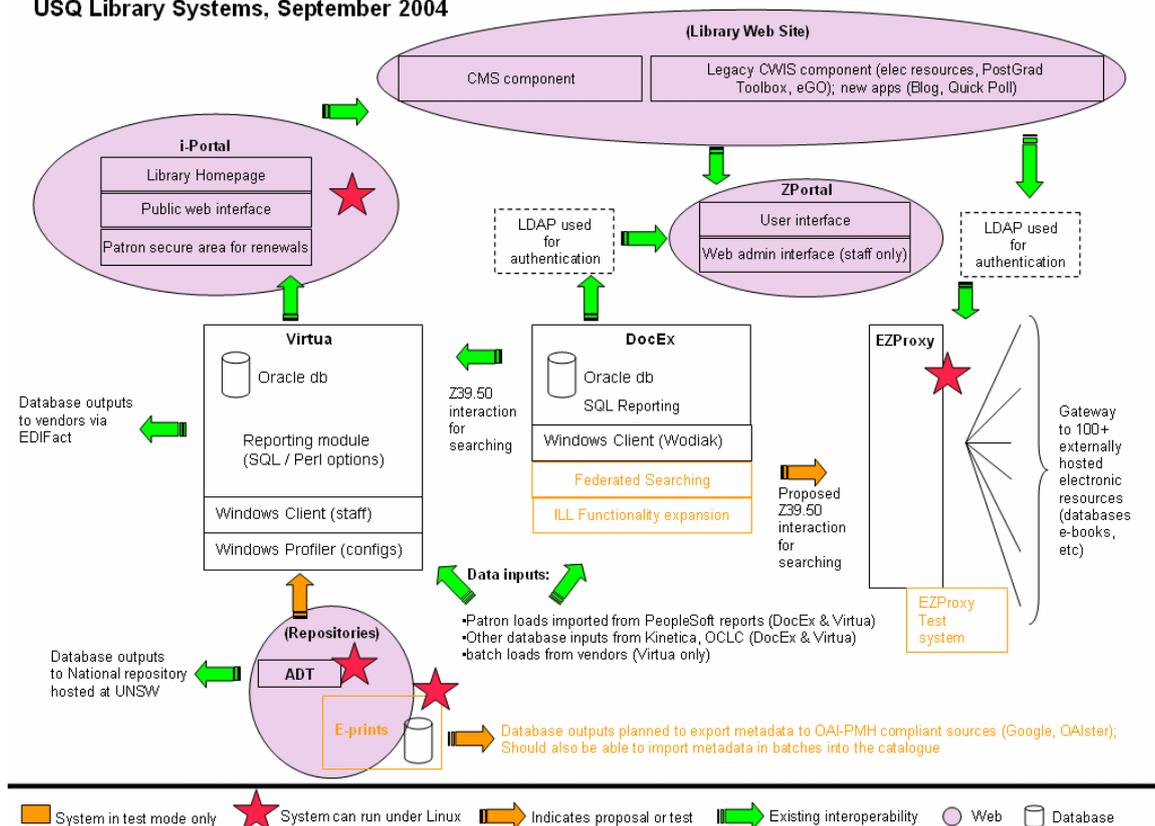


Figure 5: USQ Library systems

If nothing else, the diagram demonstrates that USQ Library has moved well beyond the monolithic infrastructure of a single Library catalogue system over the past 10 years, with the rate of modularization increasing each year. This is a fairly typical trend, with the areas of pressure outlined in the recent OCLC Environmental Scan causing “the library systems environment [to become] more densely interconnected”. (OCLC, 2003)

2.4 WHAT WE’VE LEARNED

Change, when it comes, cracks everything open. (Dorothy Allison, *O Magazine*)

Staff in the Off-Campus Services section of the Library have learned that the challenges of an immense change can be embraced and not just overcome. DocEx has fostered a close working relationship between the Systems team, who have worked intensely on both the interface and configuration aspects of the system, and the Off-Campus Services staff, who have managed the rollout of the system and dealt with all of the user and functionality issues while the system was bedded down.

We had recognised for some years that our staff needed a higher level of IT skills. The implementation of DocEx reinforced that impression. The Library has recently conducted a workforce planning

exercise that involved developing likely scenarios over the next three years, identifying the staff skills that would be needed in those environments, and developing strategies to provide those skills. Some of the strategies we'll be using, apart from specific recruitment, are targeted training, staff exchanges and secondments between sections, and a more project-based approach to work.

Our users have been fulsome in their praise for the new systems. In Phase 1, our students appreciated being involved in the trial phase and being able to give feedback. Initial reactions to the off-campus requesting system were that the system eliminated many steps, saved time and typing, and was user-friendly. Comments such as "absolutely brilliant", "wonderful" and "great" were common.

We found that usability testing is important. Lossau (2004) states that "in any market situation it is of paramount importance to take a close look at potential customers and their usage behaviour. ... the new, competitive situation forces libraries to see things much more from the perspective of the user". At each step of our phased rollout of DocEx, we have conducted a "pilot" phase with selected users in order to gather feedback and iron out problems in functionality and workflow before opening it up to our general user base. This is the best way we can ensure our users will have a positive experience with the system when it goes fully live – and is also a valuable and less stressful environment for staff to get up to speed with changed workflows and processes before dealing with large volumes of requests and enquiries.

We are also learning more and more about standards every day. Our experience of Z39.50 searching and Yaz testing is probably common to any library implementing federated search – we have added new expressions, such as "search mangling" to our daily vocabulary. Standards are important for interoperability, single sign-on, integration, administration.

The decision to pursue ZPortal's federated search capability was also affected by the existing relationship USQ had developed with the vendor over the implementation of Phase 1 of DocEx. Vendor support has been consistent and of a high calibre. Originally outsourced, support had been brought in-house in mid-2004. While there had been some concern about this change in the support relationship, particularly in the Australian User Group, USQ found it to be a relatively seamless transition. Some benefits were gained from the change, particularly the introduction of monthly support calls from our Account Manager to review outstanding Help Desk issues and to continually revise and prioritize those issues. Furthermore, USQ perceived that this vendor provided "a system to support current business practices, with an architecture capable of evolving to meet new functional requirements" as well as being "a vendor with demonstrated ability to achieve that evolution" (Richardson & Hopkins, 2004).

3 CONCLUSIONS

"Monolithic system architecture is not any longer state-of-the-art" (Lossau, 2004). Lossau argues that increased discussion between libraries and IT departments to find the potential for system integration, re-use and streamlining of administration are indicative of the increasing need to modularize and integrate disparate systems. This also offers us the potential to move beyond the silos of our departmental systems within the wider university context – to see where library systems might integrate into learning management systems, for example. The possibilities seem to be ever unfolding before us.

We need to continue to be open to opportunities to add new "modules" to our systems infrastructure, to continually redefine synergies between our systems and our services, to look for those elements of interaction and find the intersections that provide greatest benefits to our users.

Every day you may make progress. Every step may be fruitful. Yet there will stretch out before you an ever-lengthening, ever-ascending, ever-improving path. You know you will never get to the end of the journey. But this, so far from discouraging, only adds to the joy and glory of the climb. (Winston Churchill)

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