

Online Electronic information for Engineers

Who are our customers?

What are their needs?

How do we address these needs?

What effect does this have on the library and its personnel?

WHO ARE OUR CUSTOMERS?

“Normal people believe that if it ain’t broke, don’t fix it.

Engineers believe that if it ain’t broke, it doesn’t have enough features yet.”

Future professionals

Highly computer literate

Always constrained by time

Self-sufficient

Not frequent library users

Personality type: Mostly introverts, very realistic and has the ability to linear thinking.

Dress code: very conservative

Scientists vs. engineers

Scientists are researchers of the nature as it exists, while engineers are more concerned with the application of the science into something useful for the better of mankind.

They are very different from many other professions in the sense that they are focused primarily on technical products and not so much on human clients.

Although engineers share professional status, an organization and general training, they are largely specialists, trained at a university level in the numerous subspecialties of engineering (e.g. chemical, electronic, mechanical, civil, etc.).

WHAT ARE THEIR NEEDS?

Engineers need far more information than they generate. They consume information primarily to produce physically encoded information or things.

This information has to be:

- Accurate
- Up to date
- Reliable

- Original
- Immediate, i.e. online in full text, ready to download immediately.
- Integrated, all on one platform. They tend to get hooked on one platform and refuses to use anything else.

According to Leckie the following are reasons why engineers use certain databases rather than other:

Familiarity

Trustworthiness – information accurate and confidentiality of search

Prior success

Packaging

Timeliness

Cost

Accessibility

According to King engineers spend 2/3 of their time in communicating, both as input to their work (reading, listening) and as output resulting from their work (written documents, presentations).

HOW DO WE ADDRESS THESE NEEDS?

At the Academic Information Service, i.e. the library of the University of Pretoria, we strive to assist and link to the vision and mission of the University of Pretoria, but also of the different faculties we serve.

Vision (5 points)

The University of Pretoria strives to be -

- a leader in higher education that is recognised internationally for academic excellence and a focus on quality
- a university that is known for international competitiveness and local relevance through continuous innovation
- the premier university in South Africa that acknowledges its prominent role in Africa, is a symbol of national aspiration and hope, reconciliation and pride, and is committed to discharging its social responsibilities.

Mission

The mission of the University of Pretoria is to be an internationally recognised South African teaching and research university and a member of the international community of scholarly institutions

The Vice-Chancellor and Principal of the University, prof. Calie Pistorius, like to say: “We are transforming a very good university into a truly great university”. We are training the Innovation Generation of the Future. Our researchers and students are therefore entitled to only the very best the University can afford.

In this presentation I am going to concentrate on one engineering department and how we, at the Academic Information Service (AIS), addressed their needs. This is the Dept. of Electrical, Electronic and Computer Engineering.

Background on the EEC Eng. dept. and their specific needs:

There are 8 different departments within the School for Engineering at UP. Currently the EEC Dept. is the largest engineering dept. More than 1/3 of all engineering students study at this dept. There are roughly about 1 000 undergraduates. The dept. present a total of 32 courses annually on Honners level. They also have quite a few students on Masters and PhD. level. The dept. has 33 lecturers and researchers.

Annually there are about 200 undergraduate students at EEC eng. in their final year that have to submit a project. Here students are taught how to handle a project from concept to the final product. They have to start off with a formal project proposal, which includes a literature search and a lot of reading. Then they start designing, building a product and test and evaluate it against certain specifications. They have only 2 months to complete this whole process. Time is of the essence. This is where the AIS comes in.

Most researchers and scientists indicate that the most frustrating part about online searching is limited access to full text documents. Not even broken hypertext links or inadequate search engines come close to this.

- 2001: *Disaster and frustration:* Up to 2001 this was the situation within the dept. for Electrical, Electronic and Computer Engineering (EEC Engineering). Their most important resources for research were the IEEE and IEE journals. The AIS was subscribed to most of these journals in paper format. The way people did their research, was by browsing these journals. Some of them would do an electronic search on Compendex, which was readily available for the informed. Not everybody new of the existence of such a database and most engineers are not likely to enquire –very self-sufficient, remember. Very few of them would request their information specialist to do a Dialog search on INSPEC. If a journal or conference proceeding was not available at the AIS, interlibrary loans were the only option for the researcher, with implications of availability, money and time delay.
- 2002: *Solution:* The decision to buy online access to 113 IEEE Transactions, 1988+ in full text. Our users could do searches on the full IEEE database, which includes all IEEE journals, conference proceedings and standards. It also includes all IEE journals and conference proceedings, but they only had full text access to 113 of the IEEE transactions. The consequence of this was that interlibrary loans increased tremendously during this year. Users were now able to see everything that was available, but could not download it. This was even a greater frustration than before.
- 2003: *Ultimate solution:* The AIS had no other choice than to look into buying access to the full IEEE/IEE Electronic Library (IEL) package. This is a very expensive package and the AIS could not fund it alone. The dept. of EEC Engineering was so excited about this database, that they were willing to fund half of it. The time saving result they could already see was enough to convince them. With the much stronger Rand against the Dollar, the price of this package is much less and the AIS now fund it all by itself.

Show interlibrary loans statistics for 2001 – 2003.

2001: R4 811.57

2002: R12 916.69

2003: R 3 871.30

These are only the amounts spend on international interlibrary loans.

Unfortunately I could not get hold of the South African statistics as well, but this gives quite a good indication of the amount of interlibrary loans done by the dept. EEC Engineering.

- *Ripple effect:* A lot of other university departments also started to see the benefit of using this platform, eg. All departments of the School for IT, all other engineering departments, medicine and music. IEEE/IEE started to publish some journals and conference proceedings together with the ACM. This is where the IT departments benefit, together with the other journals. They also started working in collaboration with Medicine.

Show IEEE statistics

2003: 28,581

2004: 38,433

2005: 45,644

If we look at the price we paid for the IEL in 2004 against the amount of pdf's downloaded, the cost per pdf was R18.50.

Feedback from members of the dept. of EEC Engineering:

The Head of the Dept. – “The IEEE is the largest Institute in the world (all disciplines included). This Institute represents all fields of EEC Engineering, as well as Bio-engineering, Control systems, Engineering management, and much more.

IEEE is the sole or combined organiser of all important conferences on our fields of research, e.g. the Optical Fibre Conference in the USA, attended by 36 000 conference goers.

Access to all IEEE publications, therefore is very important to our dept. and a number of other departments as well. Access to the conference proceedings (which includes ‘post-deadline’ papers) give information on the latest research on all fields. With about 260 post graduate students this is of the utmost importance.”

Somewhere during last year he also told me that one of his doctoral students finished his studies 6 months earlier than expected, because of our access to the IEL.

An IEEE member and previous member of the Executive Office of the University

– “IEEE is an incredible resource. Very few people understand the huge volume of publications included in the IEEE transactions and proceedings. If one adds the Electronic Letters and the IEE Proceedings, it is one of the most powerful resources there is. The platform is quite easy to use and the results are being presented in a user friendly manner. In my own work during the past few months, I was able to gather

references within a couple of weeks, that normally would have taken me years. No serious researcher can do without this tool!!”

Another IEEE member – “Since the availability of the IEEE Explore facilities, I have noticed that the level of research that our students do before tackling final year projects, has improved drastically. The accessibility of new papers relevant to their selected topics, and the ease with which these can be used to "dig down" for previous work has a great deal to do with this.”

Chair person of the IEEE Student organisation - “Having access to the latest research and thoughts allows for cutting edge studies and can only help facilitate the learning process. Final year students in the Department of Electrical, Electronic and Computer Engineering are required to do research and reference at least three articles and material covered in IEEE publications for their project.

I have personally found that having access to the IEEE resources has allowed me to further my own education and my colleagues in the Branch agree. Having been the Chairman for two years, I have been able to use the fact that our library provides access to the IEEE resources as a drawing card for prospective members.”

What effect does this have on the library and its personnel?

There were implications for a number of departments within the AIS.

- Interlibrary loans decreased.
- Subscriptions to journals in paper format were cancelled. This had the implication that fewer personnel were needed for the maintenance of the journals in general, i.e. opening of paper copies, receiving thereof and the shelving and reshelving of the journals.
- Fewer journals had to go to the binders as well.
- Physical facilities are very expensive and libraries are forever running out of space. Fortunately new facilities were not necessary to house the large amount of IEEE/IEE journals.
- Finances neither decreased, nor increased. It was just moved from one department to another. Money was saved at interlibrary loans, acquisitions of paper journals and the maintenance of paper journals. This money had to be moved to the electronic journal fund.

Because of decreasing activity in some of the above-mentioned departments, personnel had to undergo changing roles as well to fit the increasing electronic library environment.

Especially information specialists changed from information seekers and suppliers to educators of where to find information. Most of our Engineering students believe that Google is the ultimate solution to all problems.

Fortunately it is compulsory for students at the EEC dept. to make use of the IEL in order to pass their courses.

During the first quarter of the year information specialists are fully occupied with training courses for students. Courses are compiled and produced

through Power Point presentations. For engineers these presentations are more a showing of what is available and where to find it. It is not so much a training course. They really see training of computer databases as an insult. These presentations are then linked to either the virtual library web sites we set up for every department, or on their Web CT pages. Web CT is the program we use to link all study material to. These presentations are normally combined with the lecture where they receive the subjects to their projects for the final year.

Conclusion

The IEL is one platform the University of Pretoria will never be able to go without again. I can only recommend the use thereof. It minimizes our client's stress and frustration levels and it is wonderful having all these wonderful information at our fingertips. It really does give your clients an advantage over others and help them to compete and being recognised internationally as stated in the University's vision and mission.

Bibliography

1. King, DW, Casto, J and Jones H, Communication by Engineers: a literature review of engineers' information needs, seeking processes, and use, Center for information studies, University of Tennessee, Aug. 1994.
2. Leckie, GJ, Pettigrew KE and Sylvain C, Modeling the information seeking of professionals: a general model derived from research on engineers, health care professionals, and lawyers, *Library Quarterly*, vol 66, no. 2, 1996, pp 161-193