3D IN THE LIBRARY

Want to print your own 3D model?
Check out:

MakerBot Replicator

n February 2015, the University of Queensland Library launched a 3D printing service. There were 3D printers already on campus, but access was restricted and the staff wanted to improve access. The journey to make 3D printers more widely available was fun and informative, as SUZANNE MACROW and ORMOND OXENHAM report.

Our first step toward making 3D printers more available was to plan a road trip on which we would visit libraries that already had a 3D printing service up and running. Their experience and insight would be too valuable not to use. The project team consisted of librarians, client services officers and library IT staff. We visited two public libraries and one printing service at a university. The staff were very generous with their time and knowledge and we learned a lot.

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The first thing we learned was that one machine would not be enough. This is complex technology, so failures happen and machinery goes offline. So we suggested to management that a second printer be purchased. We also learned that trying to increase efficiency by printing multiple jobs at once can be fraught with danger, as a malfunction can result in not only one ruined project but several. This forewarned us about the time component involved in providing this service. To broaden the scope of our investigations, we conducted internet searches. They showed us various ways of costing

the service, methods of submitting requests, popular software and file types, methods of payment for requested items and conditions of use.

We concluded that there was a need for this service and that it could be incorporated into existing library operations. It was now time to choose a printer and look at the logistics of providing the service.

When deciding which printer to purchase the following points were considered:

- Cost – Not only did the initial price of the machine need to be within our budget, but also the ongoing costs had to be considered. The printer's consumables were covered by charges passed on to the customer, but if they were too high then clients would not embrace the service.

- Reliability – The technology is still relatively new and the printing process is susceptible to imperfections and failures. We wanted maximum uptime for the service.

- Ease of use – We wanted anyone working in the library to be able to operate this equipment. The printer needed to be relatively easy to use and to troubleshoot. The technology is still far from 'set and forget'; it needs regular staff intervention for calibration, replenishing of consumables and troubleshooting for operating faults.

- Support – With the likelihood of frequent mechanical and technical problems, we intentionally purchased the printer from a local distributor who offers good aftermarket support. This was the driving force behind not being tempted to save dollars by purchasing overseas. The MakerBot Replicator 5th Generation was deemed the printer for us.

The printer arrived and there was an air of excitement in the library. Before it was even out of the box we already had our first printing enquiry from a medical student. A cabinet was commissioned so the printer could be publicly displayed, and so become its own advertisement. Information sessions were held for interested staff to come along and learn about the technology and its exciting applications. The attendees were invited to submit a request for a printed item, which helped us refine the requesting process for the time when the service would be open to the public. Interested staff were trained and acquired skills such as:

- understanding the working parts of the machine, including any health and safety concerns

- preparing the printer for printing and loading and unloading the printing material (PLA plastic)

- finding 3D models online and preparing them for printing

- adjusting the size, resolution and position of the model for best results

- troubleshooting failures – Was it the model? Was it the machine? Was it the user?

- completing the model with a post-print clean-up – even though this was originally going to be the responsibility of the customer.

We set up a team webpage, and staff were encouraged to add hints and tips to it.

By the time the service went live we had revised our costing model from the original $5.00 setup fee plus 10 cents per gram of material used to a $5.00 flat fee, with a build time of no longer than four hours. We are flexible with the build time if the item is for assignment work. Find more details on our webpage – go to goo.gl/zHBL2Y.

To date, we have received 456 requests, of which 427 have been completed. We have also seen a move from creating amusing knick-knacks – such as figurines of an Easter Island head or *Star Wars* characters or skulls – to objects that actually help students in their courses, such as the copy of a fossil that was made for an anthropology student, or miniature prototypes of buildings for architecture students. Early in 2016, the UQ Library will open the Centre for Digital Scholarship, and in it there will be an expanded 3D service that includes 3D scanning. Implementing this service was well worth the effort, and both the library staff and our clients will benefit.

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A figurine of the Buddha and an Easter Island statue (moai) are just some of the countless items that the 3D printer can create.