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Digital Fabrication Studio : final project outcomes

Project Concept 1: Building a multi-layered artefact with custom grooves for sensors and pcb, using a unique lazer cut approach rather than 3d modeling.

Approach: The idea was to create a tiny prototype artefact that is based on the interactive abilities of a juke box. In a jukebox, one inserts a coin and gets a momentary impulse of reaction (such as flashing lights). It was to see if any methods from digital fabrication could be used to embed some reactive parts.

Brief Description: The object in question could be CNC milled, 3d fabricated. Typically a 3d object would be approached in this way. However, a lazer cutter could also be used to cut the various slices of the model in a way that inserts a custom size 'groove' within custom thickness of the object. In this way the object retains the functions, however the sensors or other parts that are more integrated such as PCB can be changed form time to time and the behaviour of the object changed.



A multilayered object with custom grooves from a lazer cutter

The object I made has grooves within for putting an led with a certain length of wire for the eyes and a groove for the mouth to insert, eg. some objects or distance sensor. However the form can be modeled in a lazer cutter by copying the outward form and changing the internal structure of each frame.

Outcome: The figure is borrowed from a record cover as such and has to be tested with various interactive components to see what works.

Project Concept 2: Lazer 'engraved' Snake and Ladder Game

Approach: A thin 0.3 / 0.4 mm plywood part is used to explore settings on the laser cutter that gives unique slightly engraved texture with images.

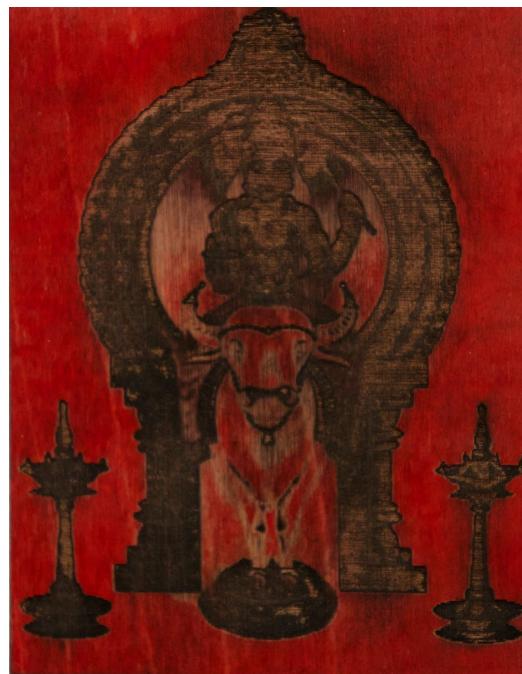
Brief Description: When using 3d settings and a very thin sheet, care should be taken not to burn the material. This can happen as a burnt out effect that blackens everything or even setting the whole material on fire. The ideal settings for this is seen when one chooses a range of 1-4 % for the power and the highest speed possible (100%). The best results were achieved with 4 % for the image at hand, which had not too heavy contrasts. If contrasts are too heavy, in black and white, then the power could be as low as 1%.

Outcome: The image that I have been using is the one that is derived from an old Indian board game called Snakes and Ladders. The versatility of materials allows one to restore some sensory appeal to the media such as print, which often goes through contemporary printing processes and materials. It also allows some room for creativity, though many small 'cold tests' have to be carried out so that material and time is not wasted.

As an experimental discovery, by adding a colour pigment (via watercolour or sketchpen) to the material, and choosing the negative of an image, one can get interesting colours etched away from the engraving. This in a way does not limit the user from trying to find material with some 'colour value' to begin with and a range of tones can be painted on (with non inflammable, water soluble paint) to get lots of interesting effects.



Lazer engraved snake and ladder game



Unique effects achieved from background colouring + 3d laser cutting for raster on thin veneer

Project Concept 3: Organization Design artefact

Approach: A 3mm plywood k is used as a template to develop some conceptual research framework artefact that would function as a negotiation tool or ‘boundary object’¹.

Brief Description: My thesis is based on trying to understand how organizations deal with communication and control issues, in ways that affect their attempt to build a learning or knowledge building organization.

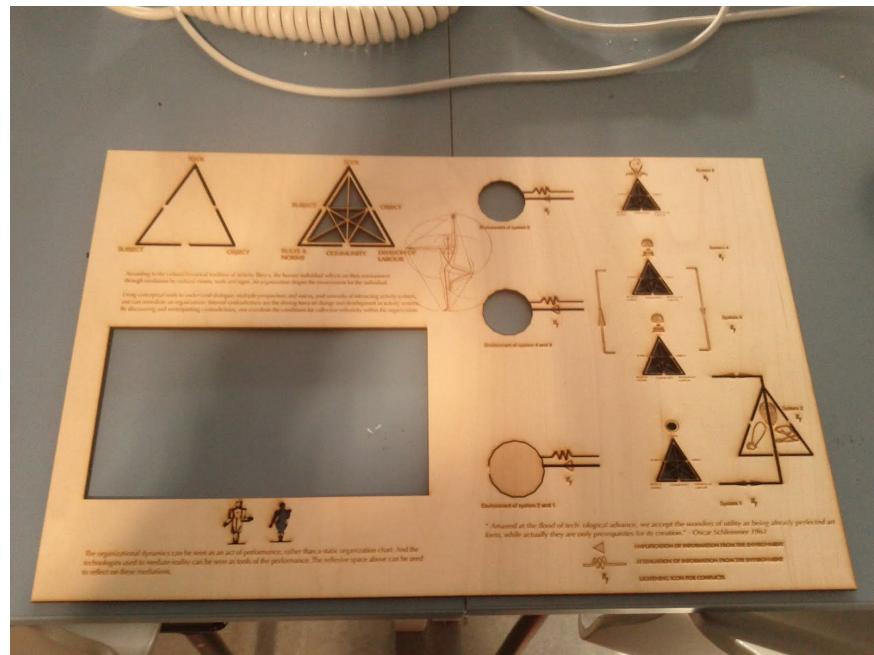
The thesis dealt with several powerful frameworks that I discovered open up a variety of archetypal conflicts across many organizations irrespective of size and function. However, presenting these frameworks were always a challenge, because meeting times would have to be predecided, ‘presentations’ designed for projections and so forth. The boundary object approach combines with prototyping possibilities of 3d printing is quite exceptional, because one can ‘prototype’ a variety of factors into such frameworks, including integrating old or new media in interesting ways.

In the diagram, I depict two key theories that have been the basis of my exploration with organization design. These frameworks, while visually oriented and analogical, are powerful in establishing the context within which the organizations could be diagnosed. However, an added dimension is ability to custom design the other details, such as a slot for inserting an iphone or ipad etc to integrate Apps with the power of custom frameworks like these.

Outcome: i tested this framework in an ongoing project with Nokia and seems that there are interesting possibilities in ‘remediating’ the organization. The boundary object remediated people’s attention to the artefact, and helps to frame the discussions around the key control and communication conflicts for further enquiry. The gap in the diagram suggests various kinds of media that can be inserted in order to amplify and integrate various convergent features from digital information into the ongoing discussion.

I think there is a lot of positive outcomes in exploring how digital fabrication could mediate the huge gaps between old and new media by strengthening the loose ends. Adding more encounters artistically, the imagination is furthermore able to go beyond traditional limits.

¹ http://denham.typepad.com/km/2003/10/boundary_object.html



The organization diagnosis artefact with custom grooves

Conclusion: The digital fabrication course enabled me to go through various basics of the technologies involved in cutting edge 3d. I found the flexibility and utility and improvisational possibilities with lazer cutter being miles ahead of the more complex 3d and cnc mill machines which are more linear in their application (unless sophisticated encounter is made in internalizing the functions of the tool.) Furthermore, the versatility of materials and surprise discoveries without causing much damage and wastage (test prints etc) are added advantages.

From the projects explored within a short span of time, the possibilities opened up with the help of digital fabrication in general seems to be quite broad.