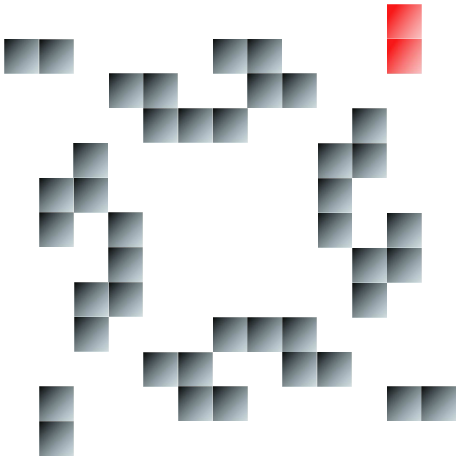

Smart eXperience Laboratory Architecture

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Smart eXperience Laboratory Architecture

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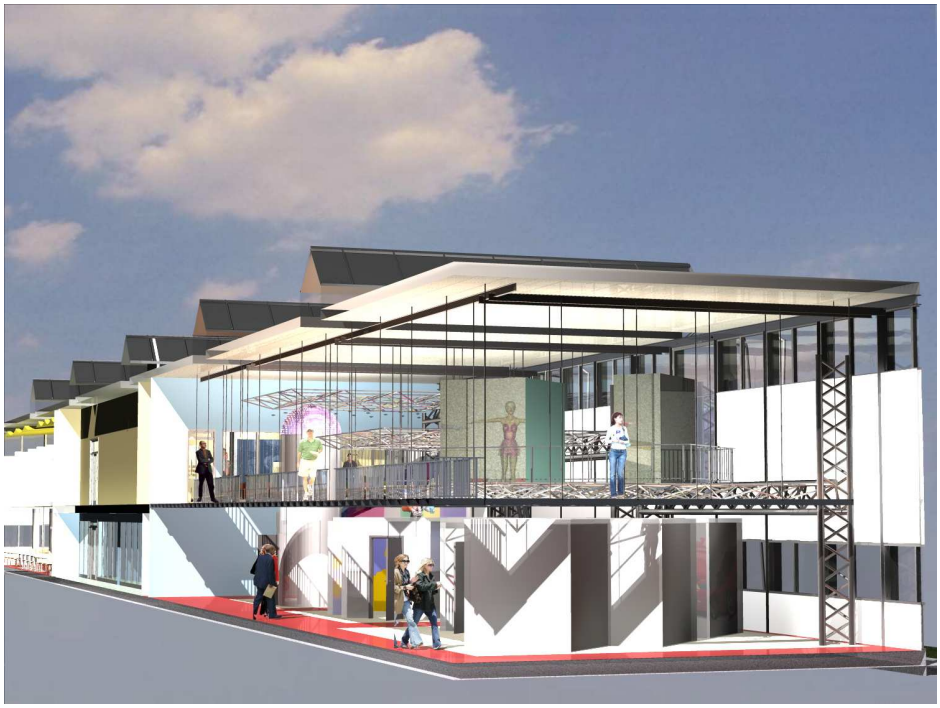
Friday 17th October, 2008

Abstract

This document describes the architectural concept of the joined SmartXp and CreaTe premises in Hal A of the computer science building at University of Twente.

The concepts has been developed for the entire building (1400m^2), whereas only part of it (825m^2) is available today. The remaining part is anticipated to become available in three years time.

In this document we first describe the full picture, followed with a proposal for phasing the implementation.



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1 Introduction

The Smart eXperience lab, SmartXp, is a crucial instrument for the development of the next generations of ubiquitous systems. Future generations will increase in complexity both in breadth as in depth; we need the expertise of more disciplines and we encounter more fundamental problems of the constituting technologies.

Creative Technology, CreaTe, aims to exploit the full potential of information and communication technology. It actively searches for novel application and fascinating combinations of technology. The result yield sound artifacts, artistically and business wise.

The **problem** at hand is to develop an architectural concept for the joined SmartXp and CreaTe premises. The SmartXp is an experience lab that combines virtues of a traditional prototype and context lab. A prototype lab views technology from an engineering point of view whereas a context lab brings technology in a realistic setting in contact with users and measures their attitude. The experience lab creates interaction between technologies and amongst technology and humans. The SmartXp is a living lab in which researchers and student are users and developers at the same time. It is a theatre rather than a museum.

The SmartXp creates the environment for two type of evolution to flourish: Darwin's (coincidental) mutations [Gould, 1977] and Bary's symbiosis (mutualism) [Margulis and Fester, 1991]. Both types are important for the evolution of technology we target in SmartXp and CreaTe.

The brief description above is the essence of the challenge we posed to an interaction designer. The quest is to develop an architectural concept that facilitate the challenge, where the leitmotiv of the design is the conjecture that a good architecture enhances the experience.

For the development of the concept we describe in the document the University of Twente organised a workshop with LuleåUniversity of Technology, Delft University of Technology and MAF Arkitektkontor. The workshop reified the following few key concepts:

Flexibility a theatrical setting requires flexibility

Fascination the architecture must remain startling. One way to achieve that is to be aesthetically appealing and foster hard (entertainment) and soft (effortless) fascination.

Simplicity the design paradigm. The flow must be logical.

The initial location in the Zilverling building was found to be unsuitable. The opportunities to achieve the amount of flexibility and fascination in that location is inadequate. It possible though to create a prototype lab or a context lab there but an experience lab is simply out of reach. The design paradigm can be accomplished in the East part of Hal A because of the empty and high space that it offers.

2 The full picture

The diagrams of Figure 7 and 8 give the full floor plan of the architecture concept for a shared premises for SmartXp and CreaTe. The ground floor (Figure 7) holds the **Education** section. The first floor (Figure 8) holds the **Science** section. The eye catching Exhibition and Experiment room currently holds three theatre stages: Theatre I, II, and III (West to East).

Accesses are to the SmartXp is on the West and East sides. The main entrance is located on the East side. When entering the reception, visitors can get information from the information desk. A pleasant waiting room is located here. From the reception there is a direct access on the ground floor to the theatres for **visit** and **participation**. Also from the reception a stair leads to the 1st floor which yields access to the overhead platform. From the platform one can **observe** activities in the theatres and **interact remotely**. The reception is also connected to the exterior corridor which is the entrance to the education

Figure 1: Community Centre

Figure 2: Theatre I

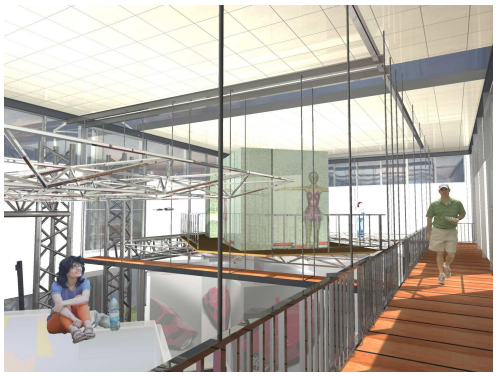

Figure 3: Theatre III

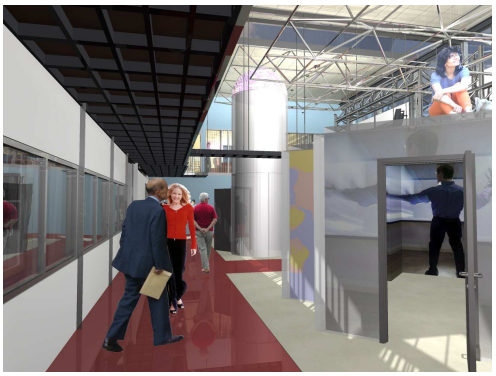

Figure 4: Theatre II

facility and a display area. Here ongoing and past projects are presented. The exterior corridor minimises the interference among experiments and mere passing visitors.

On the East side there is a service door, wide and high enough for a small truck. Note that the East side entrance is closest to the new main entrance of the Zilverling and lecture rooms. For emergencies, the southern part of the glass wall in the reception can be removed and gives easy access to the courtyard, e.g., with a (mini-)van.

On the West side there is an entrance for students and staff who go directly to their rooms. The middle entrance is designated for the Dean and company.

The Theatres are constructed with a modular system. Currently there are three rings but any other number of rings can be realised. The system offers many mounting points and outlets. Furthermore each theatre has a grid frame that can move vertically. So it can be lowered for easy access. The East ring (Theatre III) has a (vertically moveable) platform that can be accessed from the wall mounted platform along the South side of the exhibition space. The platform can also be used to erect a context or a prototype lab.

The platform along the South side of the exhibition room hangs on the ceiling. It can be made of individually hanging sections such that when lowered a staircase or public stand emerges. Lateral to the overhead platform there are three catwalks. Each catwalk can be used as a scaffold to mount experimenting equipment. Catwalks give access to the platforms and theatre grids. Moreover catwalks can move horizontally (West to East) to be moved out of the way if required and they can be moved vertically to follow any differences in level.

The installation in each of the Theatre rings are build from flexible modular systems, typically custom made for the purpose of the experiment. Some of these installations may have a more permanent character, say to serve as an interaction room or 3D cave.

The **ground floor flow** implements an accepted learning model [Kolb and Fry, 1974].

Figure 5: Reception and exterior corridor

Figure 6: Hawker centre

From West to East the flow is from theory through creating to experiment. The jaarzaal offers a place to educate, to lecture, and debate. The workshops in the centre offer a place to create new installations. There also used installations are stored, which can be incorporated in new installations (mutualism) or torn apart and re-used in parts. Finally the theatre floor offers three rings for experimentations. The rings are flexible in use and form. On the ground floor we expect to erect several labs with a prototype orientation. The attitude on the ground floor is towards participation and interaction.

The **1st floor flow** implements a research model. From West to East the flow is from staff quarters through multi disciplinary mutualism (Hawker centre) and debate (community of staff room) to experiment and exhibition. The staff quarters houses lectures and professors etc. The Hawker centre is the place where people, typically PhD students, work together in a multi disciplinary setting. Here technologies cooperate and compete at conceptual level. Newly developed technology can be tuned directly in the prototype labs for audio and video. The service room in the middle is to accommodate the flexibility of these labs. The community room (staff room) instruments a context lab for mature technology. It can be experienced and used. Also, it is an informal place for consultancy and restoration. Please note the entrance of natural light through the skylights. Finally there is an access to the 1st floor of theatre hall. We expect to erect labs on the platform with a context lab orientation. The attitude on the 1st floor is toward observation and interaction.

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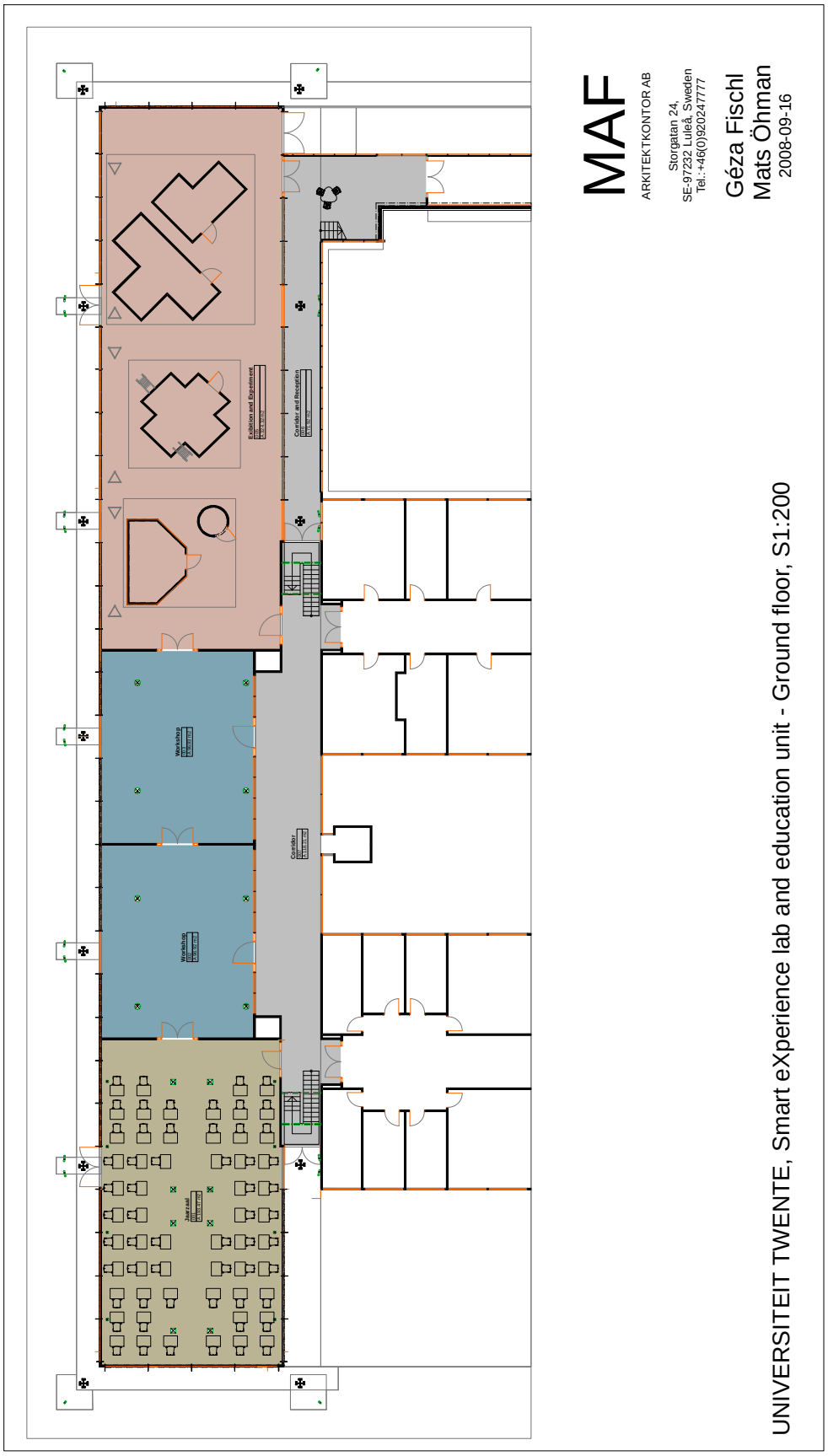

Figure 7: SmartXp the full picture. Ground floor of Hal A, the left hand side is the West wing of the building. Workshops and Theatres are numbered West to East (I, II, [III]).

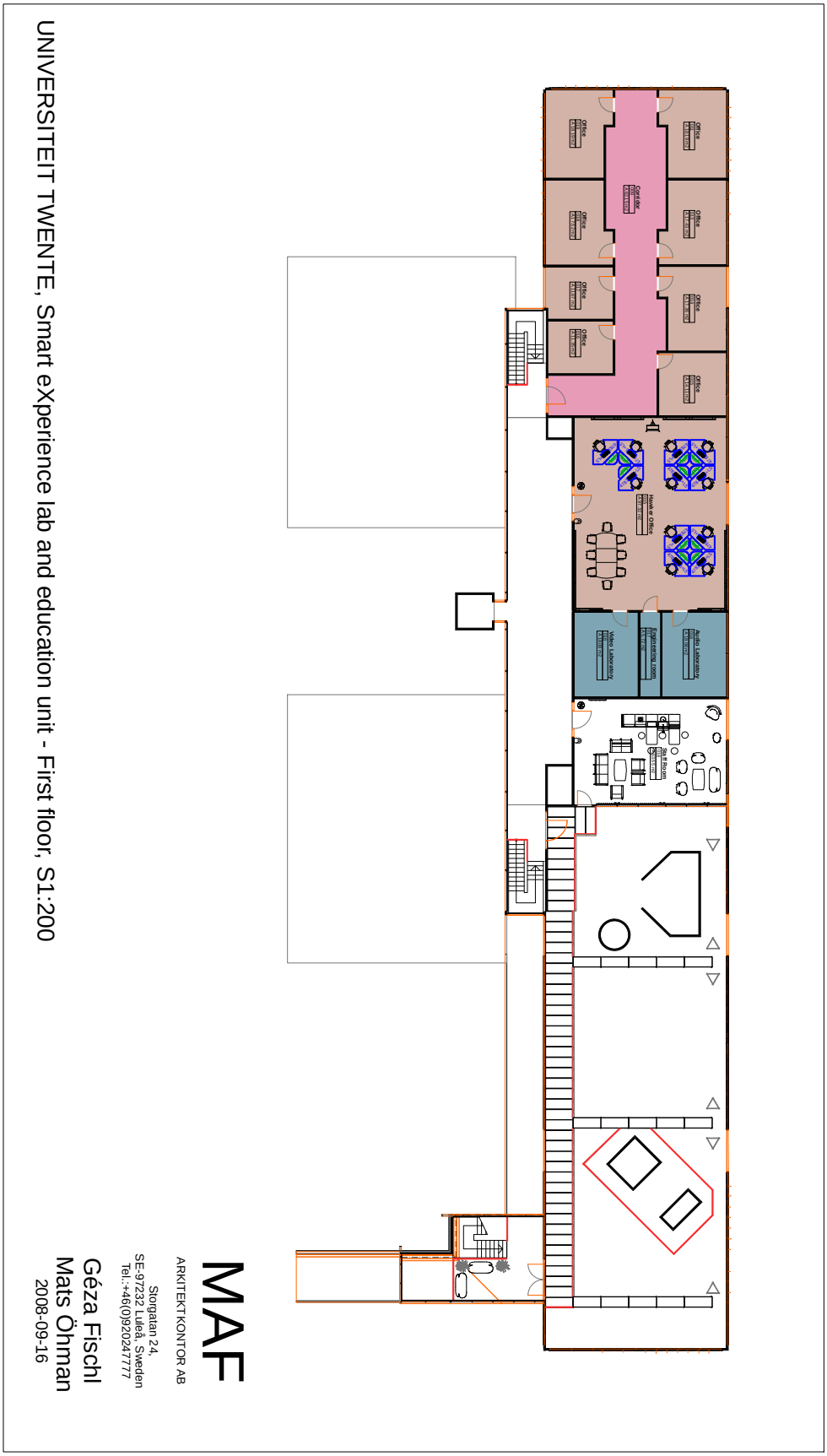

Figure 8: SmartXp the full picture. Top floor of Hal A, the left hand side is the West wing of the building. Theatres are numbered West to East (I, II, III).