Think 2025

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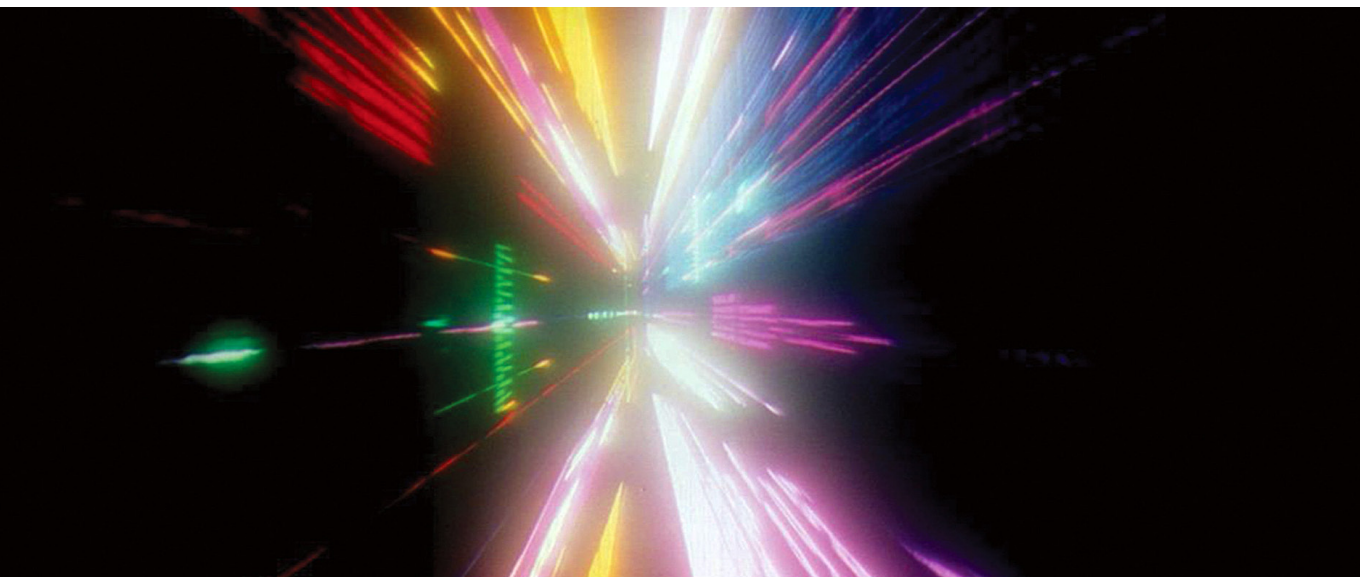
POLE - A Platform for Learning and Teaching

University students are nowadays increasingly challenged within their specific core disciplines; in addition however, they are also supposed to develop skills in order to apply this particular knowledge in practice. This ideally goes hand in hand with a sense of maturity of the individuals' characters vis-à-vis the social, cultural, and economical environment. The practical application of theoretical knowledge can thus only be implemented successfully if these three basic elements are taken into account.

In addition to university students' disciplinary knowledge, the ability to work efficiently within multicultural environments has become increasingly important. Universities are therefore looking to expand and deepen this particular aspect in order to provide the necessary expertise in this field. This realisation has led to universities becoming more proactive with regards to networking and offering joint courses, which is where POLE (Project Oriented Learning Environment) is actively involved in. In the course of this new collaboration, it has become apparent that the complementary aspect has gained in importance. An example for this is the liaising between strongly research-oriented and more practically oriented universities with the common goal of being able to implement the according results as soon as possible. Apart from contributing to more comprehensive and efficient process work, the POLE courses lay

particular emphasis on improved cultural know-how. In order to do this, students are encouraged to contribute their experiences within international teams, regardless of geographical and language barriers.

POLE sees itself as a learning system cooperating with other European or international universities. It does so within a reflexive context, taking into account the various cultures involved in order to create new methods of resolution regarding teaching and learning methods. The students are at the core of this concept, and are given the option to develop process-oriented expert knowledge through trans-disciplinary teamwork. Simultaneously, they learn to work independently and to deal with current problem cases through the use of modern information and communication tools.

Processes within POLE are largely organised within the individual teams themselves. The according goals are set and committed to within the teams; in case of resulting conflicts, weight is given to iterative processes in order to find solutions. A further characteristic of POLE is an increasing tendency for the overlapping, or even amalgamation, of various lines of work in order to give way to new, holistic, and trans-disciplinary perspectives. POLE is a comprehensive platform which gives students the opportunity to contribute their full potential. Each indi-

vidual's attitudes, characteristics, and abilities are taken into account as a whole in order to allow as much space as possible for independent development of students' responsibilities and skills. A contribution to the concept of 'Campus in Mind' is made by POLE in providing the multi-disciplinary teams with learning facilities that are based on experimental and interactive technologies.

The teamwork in the POLE courses allows the students to further expand their specific professional skills, on the other hand, it also gives them the opportunity to develop more generic competences, which nowadays is one of the key qualifications in order to be able to adapt to a contin-uously changing environment. The course also enables students to evaluate their ability to function in a team and to analyse their styles of communication. Through practical examples, students are given the opportunity to explore how well they are able to work in a team, and to what degree they are flexible to accept members' concerns from other disciplines, i.e. how they can integrate these into their own work and patterns of thinking.

Experts and mentors which do not form part of the university, but are active members of businesses and the industry in general, are an essential part of POLE courses. Their participation contributes a high degree of practical knowledge to the projects, pointing out the

actual 'state of the art'. In this manner, POLE manages to link academic education and professional practice. The intensive interaction between these two elements guar-antees a rapid transfer of technology, while at the same time ensuring that the students involved are motivated to a high degree.

POLE is not only about to significantly remould the land-scape of teaching and learning at universities, but it also intends to yield substantial influence concerning deci-sion-making and the creation of practical work processes. In association with university teaching staff, the mentors are instrumental in contributing expert knowledge and regular feedbacks to the teams, while they are also actively involved concerning the evaluation of processes and related products. The latter will be of increasing importance in the future, as scientific research has been initiated in connection with reflections of certain POLE processes. It is the intention of this kind of research to support students with regards to the awareness of their personal learning styles. The findings will then be made accessible for future work in a broader context.

Further POLE research issues include for example the creation of knowledge databases, which will serve as a tool for more rapid evaluation of solutions and deci-sion making processes in the future. These efforts
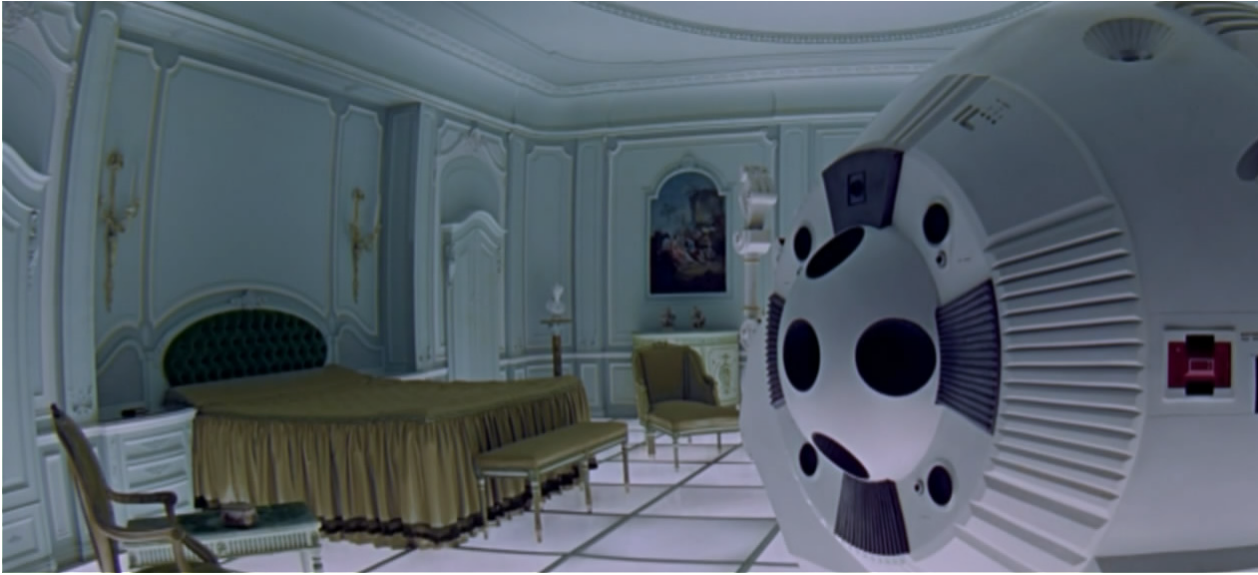
are based on the knowledge that a large part of creational, construction, and design processes are substantially shaped by re-design.

The initial POLE courses had been launched as a result of the ever increasing demands in the current building trade, which is of a highly complex, segmented, and competitive nature. Experts from the fields of architecture, civil engineering, and construction management are clearly demanding a broader education, along with more diversified core skills for engineering students. The POLE learning environment and its associated methodology is not limited to this initial context, but allows students from practically any discipline to apply their theoretical knowledge in practical cases. Through collaboration in interdisciplinary teams guided by process management students, students from fields such as architecture, urban planning, civil engineering, interior design, plastics engineering, mechanical engineering and economics were given the opportunity to cooperate in POLE projects and thus better understand the individual processes involved and acknowledge their relation to the social, economical, and political dimensions.

In 2014 POLE goes into its 14th year. It will bring together the disciplines of industrial and product design, mechanical engineering, electrical engineering, mechatronics, computer science, plastics technology, psychology, medialogy, automotive engineering and process management. POLE invites students and faculty from the University of Applied Sciences North Western Switzerland (leading house); Tecnológico de Monterrey, Campus Guadalajara (Mexico); Aalborg University, Campus Copenhagen (Denmark); Merz Akademie, Stuttgart; BTK, Berlin (both Germany); Windesheim University, Zwolle and Technical University Delft (both The Netherlands); University of Lund (Sweden) and Minnesota State University, Mankato (USA).

**Responsibilities of POLE and
its Partner Universities**
POLE considers itself as a learning platform which enables and facilitates trans-disciplinary processes. It has also proven to offer an excellent test bed for research in the field of modern teaching and learning as well as in the field of evaluation of novel learning spaces. At the same time it is important to put on record that the responsibility for the disciplinary supervision of the students remains with the sending home universities. This relates also to the grading of the students' contribution. POLE on the other hand will provide a qualification on the team processes and on their interaction patterns. (It is suggested that students who successfully participate in POLE projects receive academic credits based on the ECTS.)

The experience during the previous POLE courses has revealed that this double responsibility of the student towards his/her POLE team and towards the
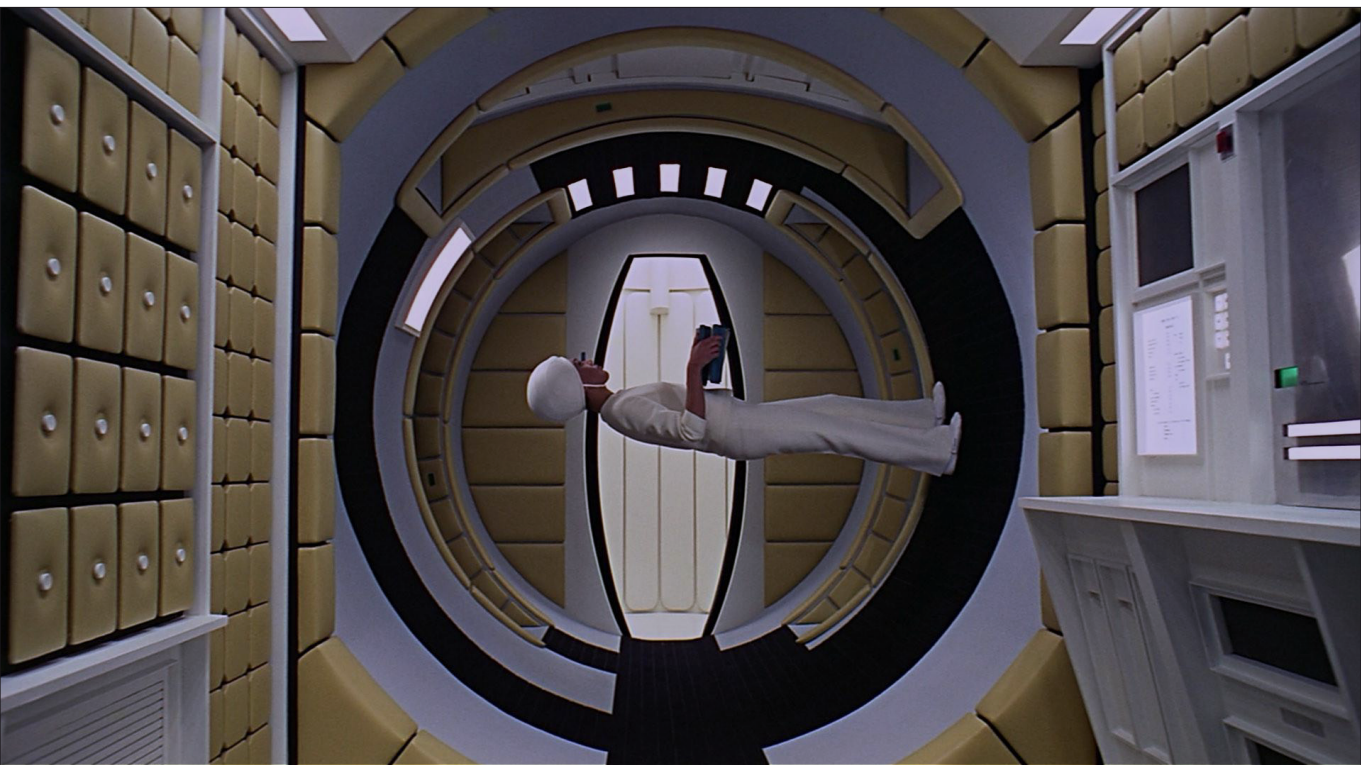
Task: Think 2025

Audi, with its approximately 65'000 employees, is one of the biggest German automobile manufacturers. It belongs to the Volkswagen group and has its headquarters in Ingolstadt in Bavaria. The company was established in 1910 and the brand name is of interest in that it is a play on words to circumvent the naming rights of the former motor vehicle manufacturer Horch. The founder August Horch - after differences of opinion with the CFO of the A. Horch & Cie. Motorwagen Werke, Zwickau - resigned and was looking for a name for his new company. He found by translating his own name into Latin. (Audi is the imperative singular of audire and means "Listen!")

Audi is not only a very successful car maker; the company has also invested heavily in research and development during the past decades. Their holistic approach respects many key areas, including design for environment, renewable fuels, vehicle safety and technologies for increased efficiency.

To a great extent, the success of Audi can be attributed to the clear commitment of the company to innovation and the search for creative solutions that anticipates the needs of users in the future. One example of such activities is the Urban Future Initiative, a biannually announced competitive award that endeavors to provide answers to the challenges in transportation and mobility in the world of tomorrow.

The consumers' desire to use technological tools and innovative gadgets that seamlessly integrate into their lives is the driving force behind Audi's product development. It is obvious that such solutions cannot come solely from technology, but have to take sociological and cultural aspects into account.

The POLE project "Think 2025" supports these efforts and strives to answer the complex question how the future will look. It is a fact that our activities are becoming increasingly connected through novel technologies and communication tools. In deference to this, the task of the present project does not have a primary focus on cars – it rather intends to better understand our activities of today and to extrapolate them into the year 2025 – hoping that such an understanding may, ultimately, help anticipate the needs of the users in the future in a much broader context.

home university and professors, respectively, may also bear conflicts. POLE demands that team decisions be respected what the approach and the agreed objectives is concerned; POLE leaders are convinced that within this frame work there is still ample tether to adhere to high academic standards in the disciplinary work.

Saying this makes it obvious that a close accompaniment and monitoring of the project by the faculty of the partner universities is essential and highly welcomed by POLE. The involved faculty will receive full access to all documents of the POLE project. Their participation during the kick-off events, the reviews and the final presentations will add to the multidisciplinary depth and thus to the quality of the project and to further developments of POLE.

Assessment

POLE has the ambition to continuously improve its learning and teaching platform. One step to do so is by integrating an external assessor into the process, who will participate in as many of the POLE design activities. POLE has cooperated in this field of evaluation and assessment with the Department of Education of the University of Applied Sciences North Western Switzerland and with Stanford University since the very beginning in the year 2000. The participatory assessment will focus on the effectiveness of the design processes and the adequate use of collaborative communication technologies.

Focusing on the upcoming interaction and communication trends, the project's task is to "think the world of 2025" and to describe and explain how people will live in a specific environment:

The student teams will focus on one of five different – but of course interconnected – prototypal environments, namely:
-        Home
-        Work place
-        Shopping
-        In transit
-        Education

The meta level question is: How will people live in 2025? It can be broken down to: How will the home of the future look like? What kind of tools and technology will one find there? How will these tools interact with each other and with the users? How will the (shared?) work place look? How will people deal with their work/life balance when a 'home office' is a standard? How will shopping be organized in 2025? Will everything be delivered by postal services? How will the (e.g. Nike) shop look? What kind of functions will it fulfill? Where are these shops - if at all?

What is the "experience of shopping"? How will education be supplied and carried out – for professionals, for academics? What are the needs when people are "in transit"? What are the requirements and qualities of the nodes and junctions between public and private transportation; train/bike, airplane/car, bus/stroller? Etc. etc.

The teams are asked to conduct megatrend research - which may also include hypotheses about countercultural developments - and, from this, create scenarios for their chosen prototypal scene. The resulting concepts must be embedded into the everyday life of 2025 and proven for feasibility, producibility and sustainability. In the specific environment that the team has chosen, three interactive products must be built and described convincingly to illustrate their purpose and ease of use (functional prototype) as well as their visual and haptic appearance (design prototype). The use of the products must be visualized in a self-explanatory way, i.e. by movies, posters, leporellos or alike.

The solutions shall be presented in the form of an exhibition booth that will remain for a few weeks at the Audi headquarters.

Process Design / Deliverables

POLE as a platform for learning and teaching not only focuses on the product but puts strong emphasis on the structuring of the design process. The following list of deliverables shall facilitate the work process for the teams as a back bone.

Physical Kick-Off (February 20 to 26, 2014)
Team Building and Trust Building
At the end of the physical kick-off week in Windisch, Switzerland
- Written statement of team objective(s)
- Distributed collaboration and information management framework
- Description of the expected contributions of each team member

Design Review I (Videoconference; March 26, 2014):
(duration of presentations 15 minutes/team; discussion 20 minutes)
Trend Research and User Story
- Mega Trends, Technology forecast
- Product Ideation
- Product Selection and Rationale for Decisions
- Research on Selected Products
- Reflection on Distributed Team Collaboration (including the role of each team member)
- Project Timeline and Milestone Check
- Questions to Coaches

Note: Final versions of all of the materials that will be used in the design review presentation (PowerPoint presentations, spreadsheets, sketches, etc.) must be uploaded to the team's intranet platform 1 day prior to the review to make sure that all sites have access to them.

Design Review II (Videoconference; April 30, 2014):
(duration of presentations 15 minutes/team; discussion 20 minutes)
Conceptual Work & Proof of Concept
- Description of Selected Products (out of a series of many)
- Proof of Concept
- Sketches and Mock-ups
- Story Board (concept for final movie)
- Reflection on Distributed Team Collaboration (including the role of each team member)
- Project Timeline and Milestone Check (including identification of remaining tasks and deliverables for project completion)

Final presentation (June 4, 2014)
All relevant final deliverables must be uploaded to POLE's Project intranet portal. (by June 2, midnight)
Visualisation, Demonstration of Prototypes and Movie

A. Oral Presentation of Project Outcomes (audience: colleagues, faculty and jury; duration: 20 minutes/team)
- Floor Plans of Envisioned Scene in 2025
- Proof of Concept, Demonstration (functional and visual via "works-like" and "looks-like" prototypes), Discussion of why and to what extent the proposed design fulfils product requirements
- Posters (templates will be available), Animations and Movies (max. 5 minutes)
- Discussion of Individual Learning Insights

B. Oral Presentation of an Executive Summary for a Delegation of Audi's Directorate (duration: 4 minutes/team)

C. Physical Deliverables (due at final presentation)
- Physical Representation of the Team's Environment (Floor Plans, Booth, Posters)
- Three Physical Prototypes of Proposed Design (design and functional prototypes)
- Copies of 3D Renderings of Proposed Design
- 5 Copies of a Comprehensive Final Project Report, which should include the following sections:
  1. Executive Summary outlining the key points of the proposed design
  2. Background Research section documenting any relevant background research that was conducted
  3. Requirements Section documenting the final list of design requirements the team generated, and to which stakeholders they have a focus to
  4. Design Development Section documenting the different ideas that were generated and the decision making process that was used to select the final concept (with rationale)
  5. Design Specification section documenting the specifications of the proposed design (detailed engineering drawings, including materials information should be placed here)
  6. Design Process section documenting the overall design development and interdisciplinary processes that were used by the team (including reflection on the multi-cultural and interdisciplinary aspects of the project).
- 5 Copies of DVDs containing the final report, the movie, etc. plus possible appendices

Information and Collaboration Technologies ICT

POLE is offering a modern infrastructure with respect to information and communication technologies (ICT). POLE encourages the partner universities to support their students with respect to ICT as much as possible, in particular granting them access to their own information technologies. The following list of ICT tools characterizes the minimum and necessary standards:

· 24 hours per day access to work stations, so students can work on their tasks and are able to communicate at all times
· Access to telephones with international access for conference calls
· Video conferencing facilities (available at least 2 hours per week and team)
· Suitable IT support (firewalls, basic support)
· Broad band internet access
· MS-Office including PowerPoint, Acrobat Reader, ZIP and FTP programmes

During the kick-off sessions POLE will provide instruction in the use of data transfer tools for the sharing of the use of video conferencing as well as in disciplinary applications.

Team Composition

The POLE Think 2025 course 2014 is based on the cooperation of the University of Applied Sciences North Western Switzerland (with its faculties of industrial design, plastics engineering, electrical and mechanical engineering, computer science, psychology and process management) and eight global partner universities.

Approx. 50 students in eight multi-disciplinary teams will work on the anticipation and the visualisation of "Concepts for Life in 2025" under the guidance and supervision of more than 10 faculty members located at the partner universities.

Evaluation Criteria

The evaluation of the project results will be in the duty of an international jury. It will consist of one member of each disci-pline and two members of the POLE directorate as well as of members of Audi. Each team will receive a report with an acknowledgement of the contributions according to the following criteria: (1) fulfilment of Audi's requirements (specifications will be handed out during the kick-off week by the patron), (2) usability, (3) innovative potential of solutions, (4) presentation of product, (5) general impressions.

Confidentiality Agreement

Due to the high potential of such a novel product Audi and POLE have agreed to respect a confidentiality agreement which in turn has to be signed by all partners involved in the project. Individual copies for each participant will be sent to the selected students in advance and shall be ready for signature at the kick-off event. They are a requirement for the participation in the project.

Budget for Production Costs
Each team is granted a budget of max. CHF 700 for material and production expenses. Payments can only be made by POLE against bills or (signed) receipts.

Cost of Living and Accommodation
Thanks to the financial support of sponsors and the industry partner Continental, POLE is able to partially subsidize the cost of living and those for the documentations and hand-outs for the participating students.

Insurance
Note: Each participant is responsible for her/his own insurance matters.

Project Agenda
Virtual Kick-Off (by Videoconference from Home Universities): February 11, 2014

Physical Kick-Off at University of Applied Sciences and Arts, Windisch, Switzerland: February 20 - 26, 2014.

Review 1 (by Videoconference from Home Universities): March 26, 2014

Review 2 (by Videoconference from Home Universities): April 30, 2014

Final Presentations (all teams, faculty, jury, industry partners): June 4, 2014

Stakeholder & Sponsor

Audi