STARTS

Innovation at the nexus of

Science, Technology, and the ARTS

A perspective on innovation linking
science, technology, society, culture, and ... the Arts

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Just 25 Years Ago

- *No World Wide Web*
- *No NMR Imaging in medicine*
- *No sequenced human genome*
- *No sophisticated Financial Engineering*
- *No GPS (atomic clocks)*

Much of this [technological] innovation came from research universities: it was knowledge-driven

Innovation has changed: From 20th to 21st century

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ICT is changing the way we interact, create, and innovate

Culture3.0: culture as a (social)platform of innovation

Human-centred innovation

Co-creation

Virtualisation of content

Entrepreneurial spirit

Open - Participatory

Open - Borderless

20th century	21st century
Specialisation	Transdisciplinarity: Innovation happens at boundaries
Knowledge: R&D drives innovation	Creativity
Technology: standardisation	Services: ecosystems Avoid the hardware trap!
Culture and Technology are separate sectors	Crossovers from Culture to innovation in industry and society

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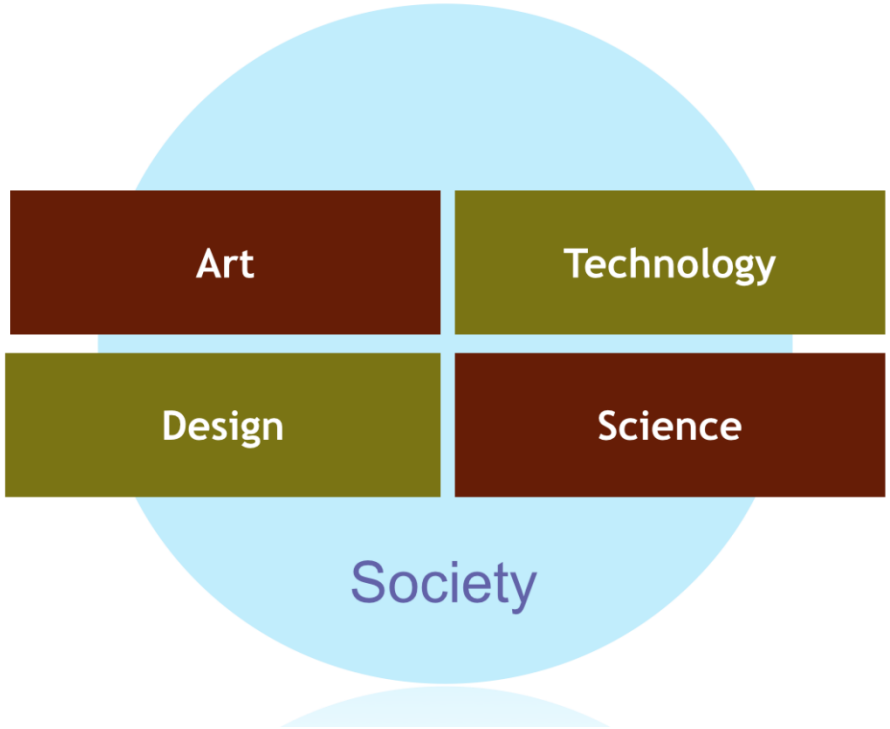
Innovation at the nexus ……



Technology
Solutions....
How to make it (feasible)?

Science
Questions -Exploration
What is (in principle) possible?

The Arts
Questions - Visions
What could/should be possible?

Design
Solutions....
How to make it!

'Design is not about how it looks, it's about the system thinking that went into [a product]'
John Maeda, MIT

'Artists put ideas and values into physical forms [and/or processes]'
Olafur Elliasson

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Iphone: competitive edge needs more than just technology

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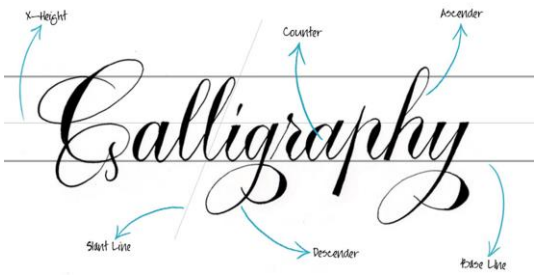
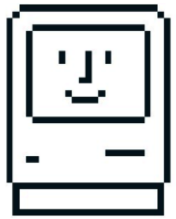
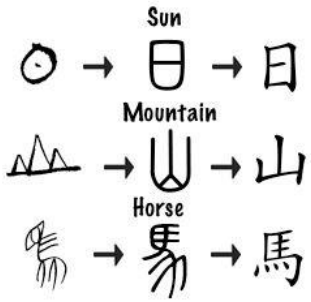
"The reason that Apple is able to create products like iPad is because we try to be at the intersection of technology and liberal arts, to be able to get the best of both."

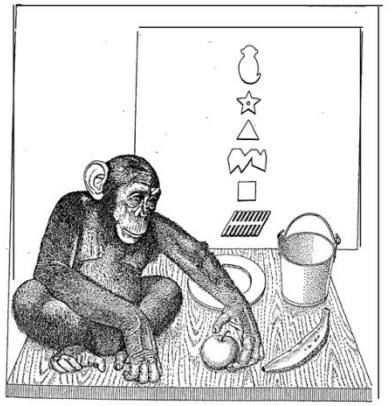
"I think our major contribution [to computing] was in bringing a liberal arts point of view to the use of computers."

Steve Jobs, CEO, Apple









The Iphone intertwines seamlessly:

Technology
Services (Apps-Itunes)
Design
Interfaces

Example: Mercedes teams up with artists for the car of the future and the future of transport

Daimler works with Ars Electronica Futurelab to explore new ways to communicate with autonomous cars.

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Crossovers supported by policy

G. H. Öttinger (in answer during EP hearing):

"Artistic creativity and critical thinking are essential for innovation in today's digital world. Already, highly innovative companies thrive on a strong link between artists and their engineers; Daimler has set up a lab exploring futures of urban transport with artists..... ".

112TH CONGRESS
1ST SESSION

H. RES. 319

Expressing the sense of the House of Representatives that adding art and design into Federal programs that target the Science, Technology, Engineering, and Mathematics (STEM) fields encourages innovation and economic growth in the United States.

IN THE HOUSE OF REPRESENTATIVES

JUNE 21, 2011

Council conclusions of European presidency :
Crossovers from culture to innovation in industry and society

...The council considers that crossovers between the cultural/creative sectors and other sectors can be understood as a process of combining knowledge and skills in order to generate innovative and intelligent solutions for today's societal challenges.....

....The council invites the Commission to take actions for
- supporting multidisciplinary teams of artists, researchers and technologists;
- developing at all stages in education transversal skills, such as critical and creative thinking;

.....

Global players are already implementing crossovers in education:

- China is strongly pushing a more active role for art across all education.
- US has launched the STEAM (STEM+ARTS) programme in education and innovation
- Korea is both in industry and culture very active in achieving synergies/crossovers
- Europe trailing: Aalto university laudable exception!

H2020 initiative
STARTS == S&T+ARTS
The goals

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Creativity is key to companies' ability to innovate and a society's ability to create value.

STARTS - Innovation at the nexus of **S**cience, **T**echnology and the **ARTS**
Initiative of EC in DG CONNECT in Research/Innovation and education.

Goals of STARTS:

- Bringing artists into development teams as integral component of innovation process.
- Bringing artists into high-tech companies as facilitators and work environment designers
- Hybrid experimentation recombining artistic, design, scientific and technological thinking
- Artists involved in testing and in triggering of prototyping

Operational goal:

Promoting/facilitating inclusion of artists in (most) H2020 funded projects.

Identified obstacles:

- Sectorial thinking ('silo thinking')
- Lack of opportunities for interaction of artists and scientists/engineers

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STARTS: How to achieve goals? Funding in H2020

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- Matchmaking: Coordination activities allowing artists and engineers/scientists to interact

- Fund residences of artists in technology and of scientists in art institutions.
- Matchmaking events: artists meet engineers/scientists (7 on 7 events)
- Small scale projects that have artists and engineers collaborate on prototypes

- STARTS EDUCATION: Cross-Sectorial Curricula to promote Technology- Arts links in higher education (following lead of Aalto university)

- STARTS prize to give visibility to innovation rooted in links with the Arts
  Two categories (each awarded 20.000Euros):
  - Appropriation by the Arts has altered use, or perception of technology
  - Collaborations of industry with the Arts opening new pathways for innovation.

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Two findings of a study on STARTS

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CLOSE-TO-MARKET OUTPUTS

Results of art and technology research projects are in their majority in the form of proof of concept. Knowledge is materialized in concrete applications and very often including usability testing in their in early stages. Results are therefore closer to market.

CREATING NEW TECHNOLOGIES

Many artists have been at the origin of new technologies. The example of the Berlin-based company ART+COM is key. The company created the Terravision system in 1994 that many consider to be the prequel to Google Earth. It can be said that the artistic origin of one of the most successsful worldwide on-line platforms lies in Europe, but was commercially explored elsewhere. More recently, Eduardo Miranda has developed the new bio musical computer which potentials will certainly take some time to be unveiled.

More info on STARTS and STARTS study

http://ec.europa.eu/digital-agenda/en/ict-art-starts-platform

http://ictartconnect.eu

'Artists put ideas and values into physical forms [and/or processes]'

Olafur Elliasson

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3D printing and Arts:
Melting arts, craft, industry and DIY

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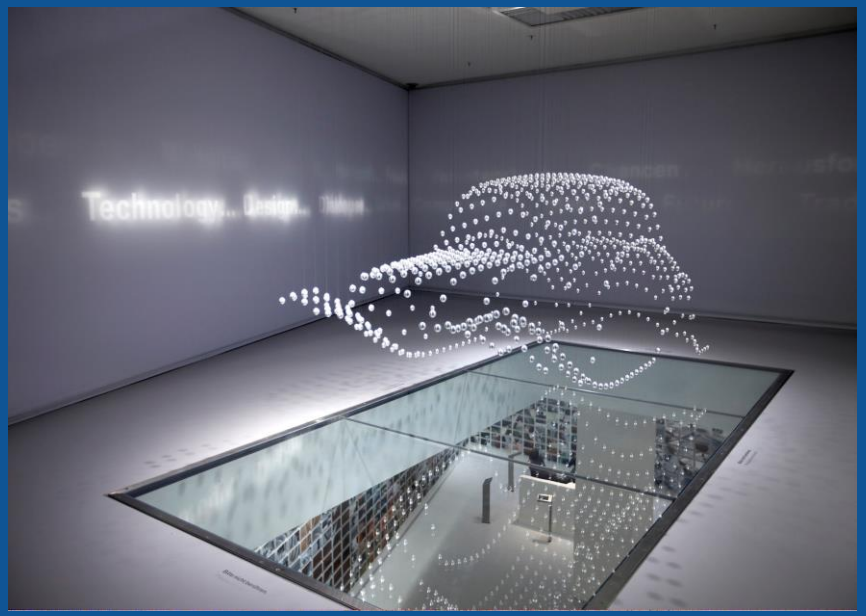
Product development as art installation

Nick Ervinck, artist



Nick Ervinck's collaboration with Materialise, a Belgium 3D printing company has been pushing the boundaries of 3D Printing.

He has been challenging the company's engineers with his intricate designs.

Art+Com and BMW
Kinetic Sculpture, 2008

The form-finding process in car design as five seven-minute choreographed sequences covering the design process of five iconic cars from the company's past and present.

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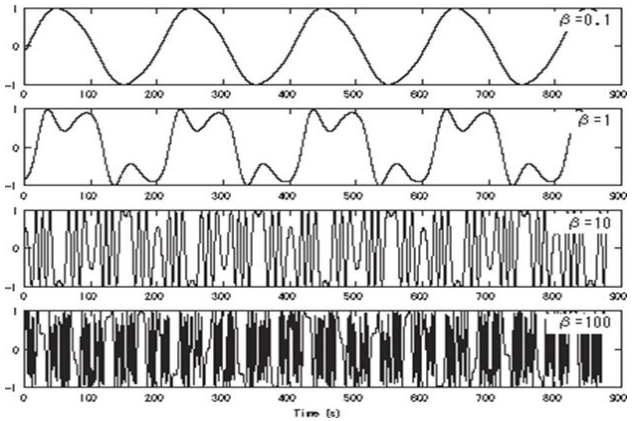

The audio industry is rooted in the desire of an artist's - John Chowning, Stanford - to compose electronic music.

Eduardo R. Miranda, Plymouth University

Bio-computer Music explores the potential of the bio-computer, an interactive musical computer based on living organic components (Physarum polycephalum) cultured on a circuit board.

Most sounds we record and reproduce today (including synthesized voices) are rooted in this discoveries (another ingredient is FFT)

It evolved into what is now called DSP (digital sound processing)