

An international perspective on design & technology
lessons for the road ahead

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Overview

- State of the Nation
- A contemporary justification for a changing landscape
- Clarification from an international study
- Six international influences
- Impact of the influences?
- Questions for the future

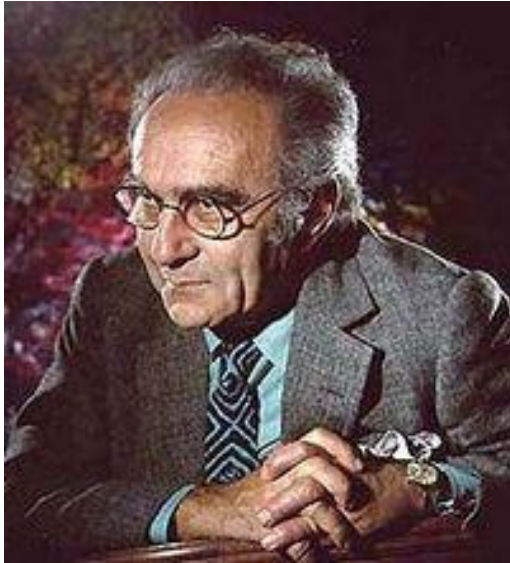
State of the Nation



- Primary doing better than secondary
- Secondary schools rarely build on primary experience
- Insufficient opportunities for 'modern' technologies
- Take up of electronics and systems and control low
- Dated approaches reinforce stereotypes
- Insufficient use of CPD

Could do better!

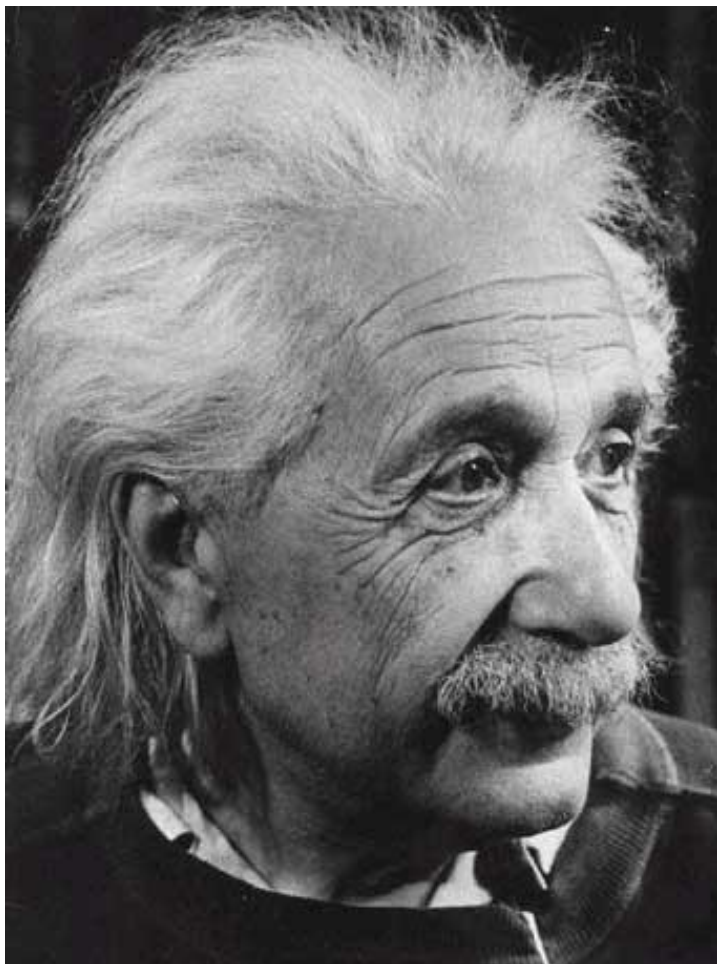
1. Cultural significance



Man is a singular creature. He has a set of gifts, which make him unique among animals; so that, unlike them, he is not a figure in the landscape ...

... he is a shaper of the landscape.

The hand is the cutting edge of the mind. Civilisation is not a collection of finished artefacts; it is an elaboration of processes. In the end the march of man is the refinement of the hand in action



Imagination is
more important
than knowledge



He (the engineer) has to conceive of a concrete object which does not yet exist, and he has to determine spatial and temporal details which cannot yet be observed, but will have to be created by the designing and manufacturing process.

2. Achieving personal effectiveness



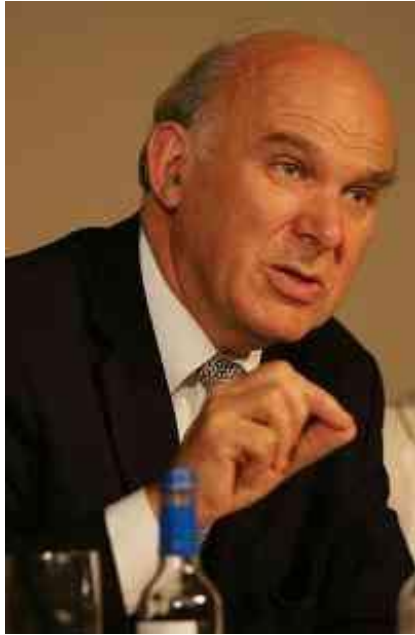
Self esteem

Self efficacy



A can do approach

3. Economic recovery



We have to improve the image of manufacturing ... if we are to attract the brightest and best into industry

BIS | Department for Business
Innovation & Skills



We want the words 'made in Britain, created in Britain, designed in Britain, invented in Britain' to drive our nation forward



HM TREASURY

4. Meeting global challenges

Technology creates solutions that create problems which require further technology to solve

Climate change

Resource depletion

Resource distribution

Health and wellbeing

Energy supply

Transport

Information availability
and reliability

The ministerial position



It is crucial that we identify the essential knowledge that children need in order to progress and develop their understanding

Facts

Concepts

Principles

Fundamental operations

Concepts

Main concept	Sub-concepts
Designing (design as a verb)	Invention
	Optimising
	Trade-offs
	Specification
	Product life cycle
Systems	Artefacts (design as noun)
	Structure
	Function
Modelling	
Resources	Materials
	Energy
	Information
Values	Sustainability
	Innovation
	Risk/failure
	Social interaction
	Technology assessment

Contexts

Shelter (construction)

Food

Artefacts for practical purposes

Water

Mobility (transportation)

Energy

Communication

Safety

Health (biomedical technologies)

International Influences 1

- The rise of makerism
 - The Fab Lab movement
 - Providing hacker spaces where you can come together...feel comfortable, have fun ... ideas really flow, once you form the ideas you have the equipment to work them out
 - 3D fully assembled, touchable, holdable objects that are as downloadable as music or movies!



International Influences 2

- The influence of engineering
 - Not ITEA but ITEEA
 - Using technology to enhance learning in mathematics and mathematics to enhance learning in technology



International Influences 3

- The impact of modern materials
 - Programmable materials
 - Robot modules
 - Claytronics
 - Origami
 - Fluid assembly
 - DNA velcro
 - Biology based - the bio brick phenomenon



International Influences 4

- Considering design as social activism
 - The difference between good design and design for good



Everything that I designed
is absolutely unnecessary



Emily Pilloton
Design revolutionary

International Influences 5

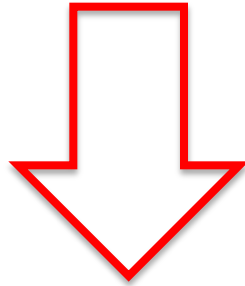
- The curriculum in France and China
 - Robotics features highly
- Artificial intelligence (AI) will become embedded in most everyday objects



International influences 6

The planet is changing
the way it behaves!

We are running
out of stuff!



An imperative to radically
change the way we do things

Impact of the influences?

Designing
without
making

Designing
and
making

Making
without
designing

Exploring
technology
and society



Impact of the influences?

Making
without
designing

The influence of
engineering leading to
the UTC Curriculum ...
Maintenance
Repair
Installation
Manufacture

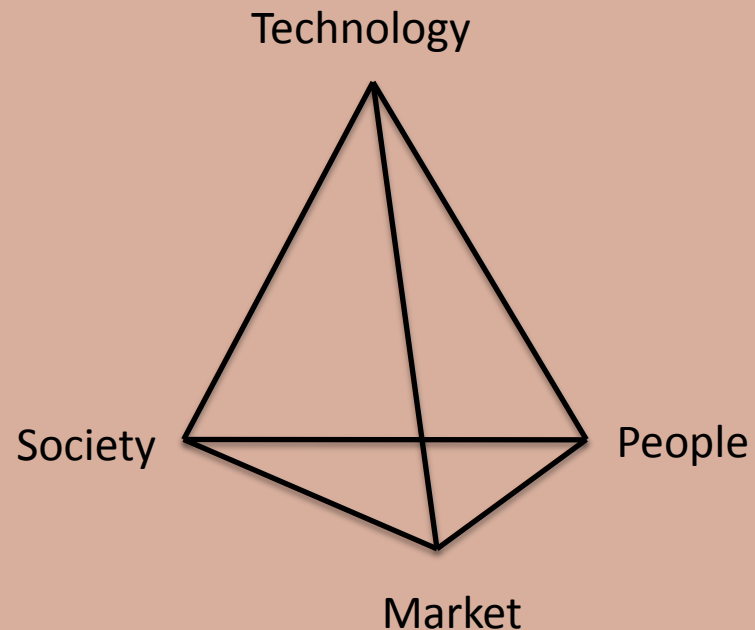
How might the KS3
precursor manifest itself?

Impact of the influences?

Designing
without
making

How might this manifest
itself at KS3 and KS4?

The impact of
considering modern
materials ...

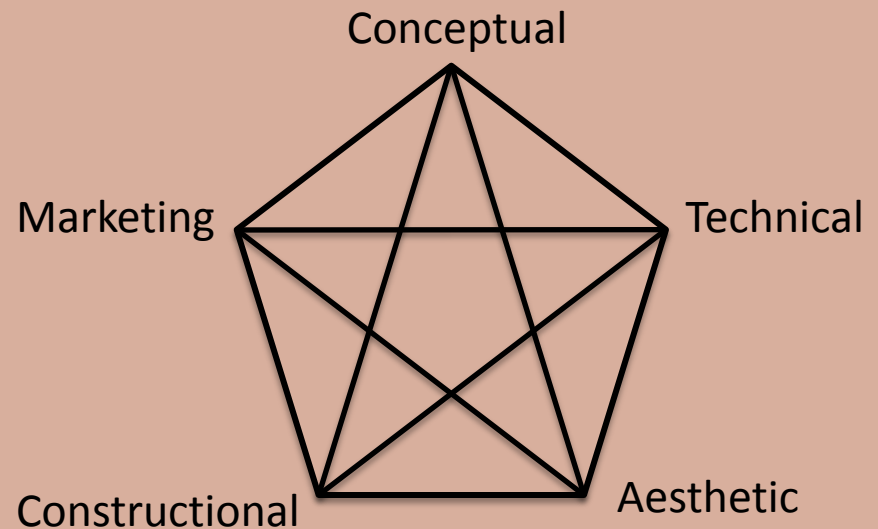


Impact of the influences?

Designing
and
making

How might this manifest
itself at KS3 and KS4?

The rise of makerism ...

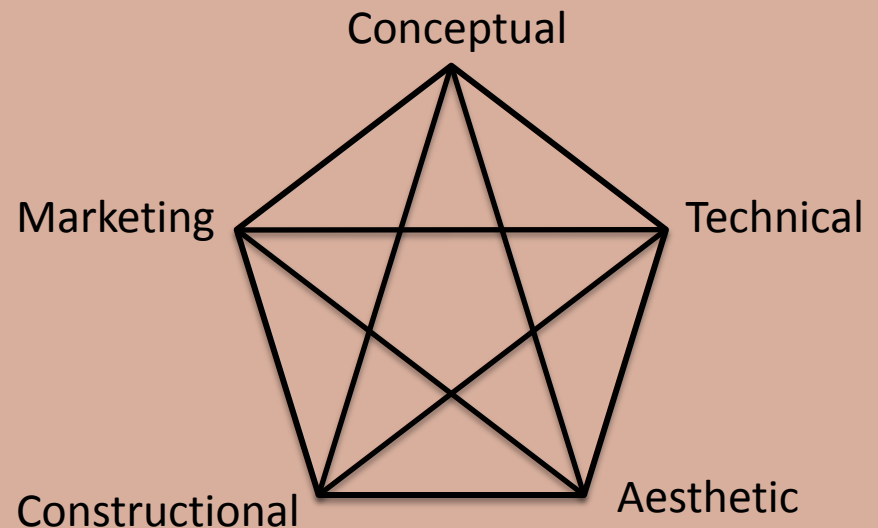


Impact of the influences?

Designing
and
making

How might this manifest
itself at KS3 and KS4?

The influence of
engineering ...



Where will mathematical
modelling feature?

Impact of the influences?

Designing
and
making

Design as social activism

...

Something
For
Somebody
In a
Situation

How might this manifest
itself at KS3 and KS4?

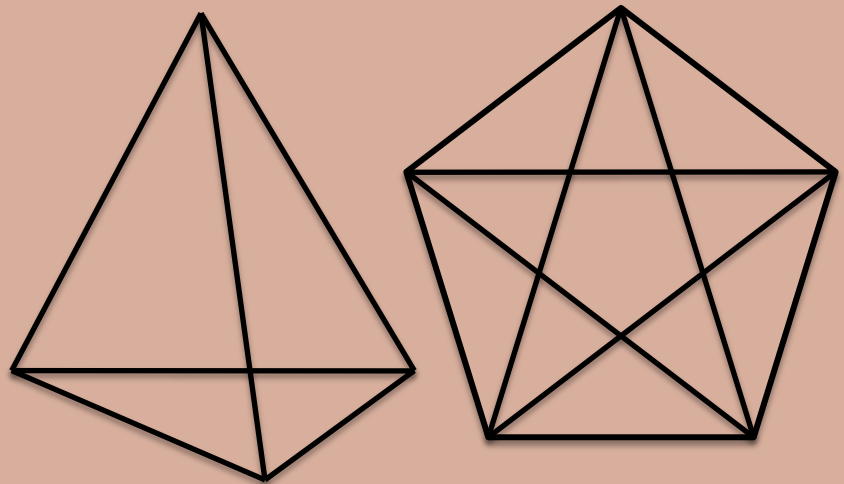
The triple S approach to
design

Impact of the influences?

Exploring
technology
and society

The impact of
considering **modern
materials**

How might this manifest
itself at KS3 and KS4?



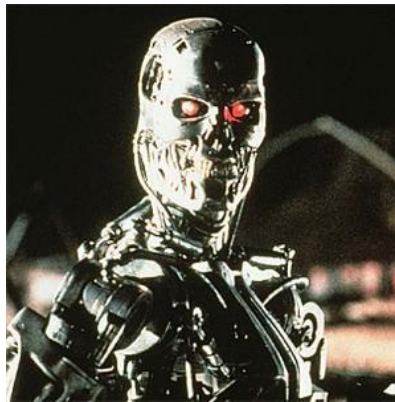
Impact of the influences?

Designing
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Robotics
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Designing
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Making
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Exploring
technology
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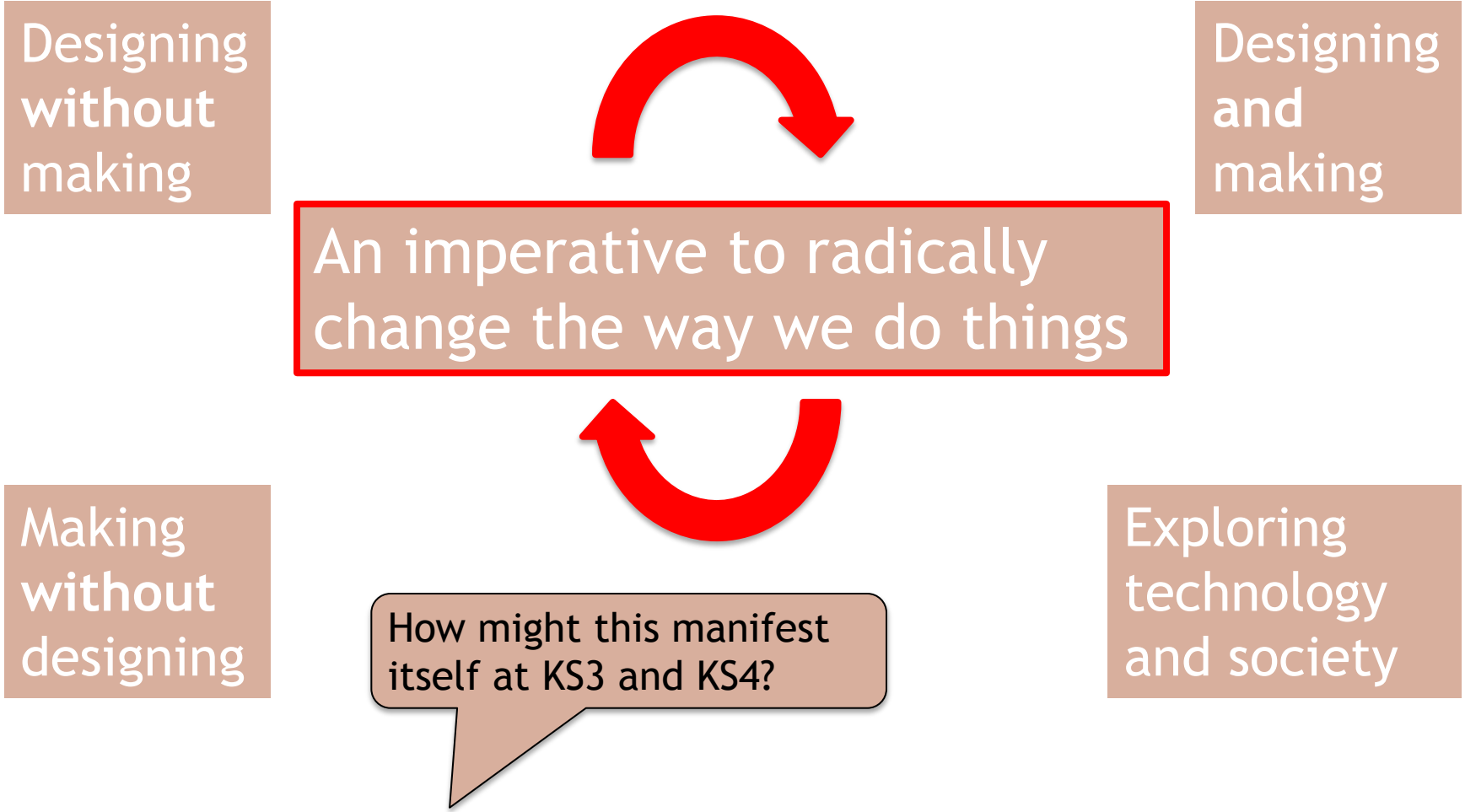
How might this manifest
itself at KS3 and KS4?

See ect framework
Hidden Worlds and
Thinking Machines

Impact of the influences?

Designing
without
making

Designing
and
making



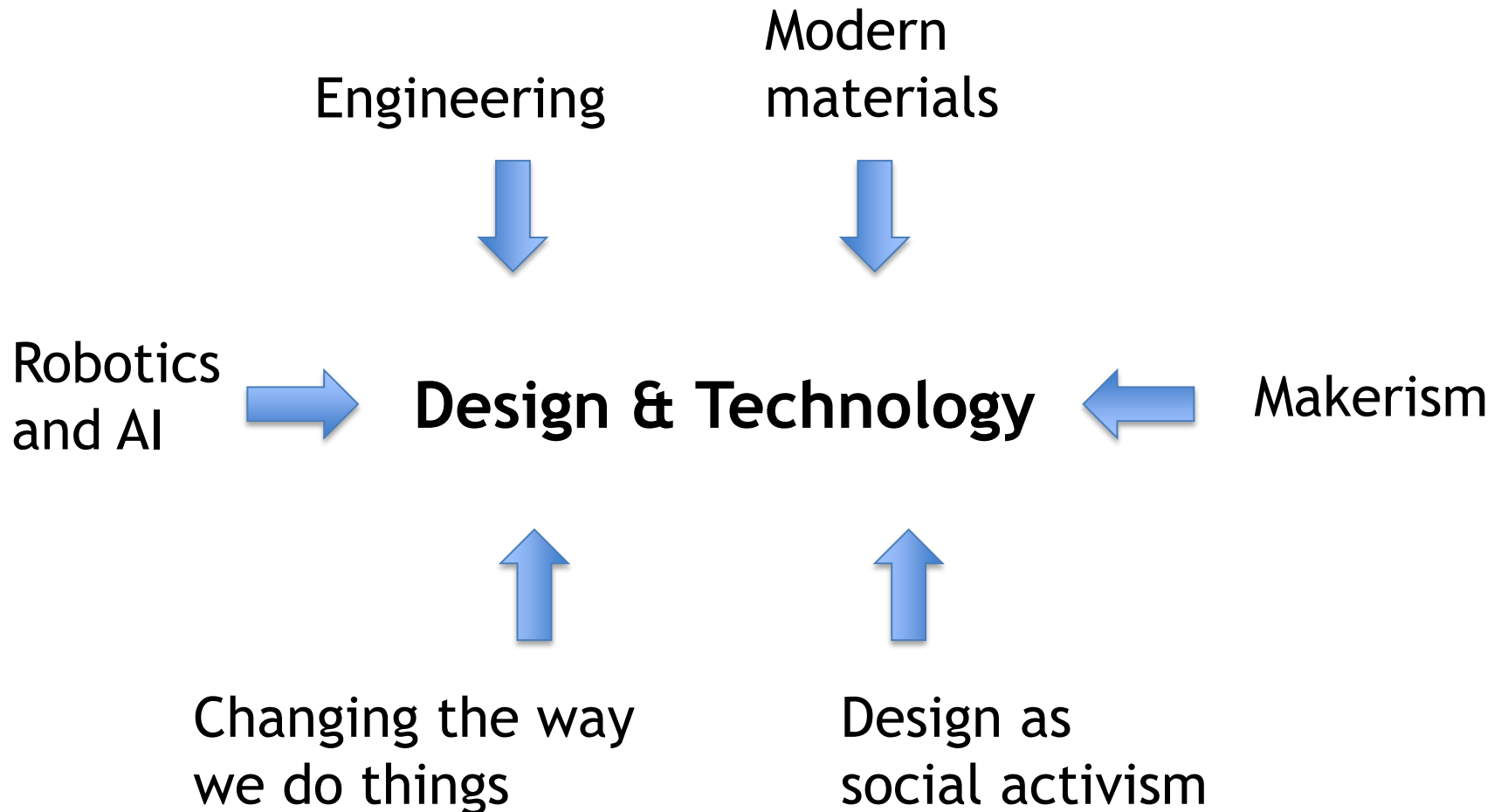
An imperative to radically
change the way we do things

Making
without
designing

Exploring
technology
and society

How might this manifest
itself at KS3 and KS4?

Influence overview



A note of caution

It would be sad if an exciting and radical curriculum innovation, potentially of great significance, should collapse under the weight of the unrealistic responsibilities being placed upon it.

David Layton OBE 1925 - 2010

Questions for the future We have until 2013

What should drive the modernisation agenda for design & technology?

What already exists on which we should build?

What already exists that we should abandon?

How can we strengthen the roles of mathematics and science within design & technology?

How will design & technology education manifest itself in different schools - academies, UTCs, free schools, faith schools, specialist schools?

How do we square the vocational versus general education circle?

Will a TechBac solve the EBac problem?

How will we ensure that the curriculum we create is irresistible?

Who will fund the necessary CPD?

Who will provide the necessary CPD?

Should we be considering technology as opposed to design & technology?

What should NAAIDT and D&T Association be doing?

Thank you for your attention

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