MANAGING MULTIMEDIA CONTENT

A TECHNOLOGY ROADMAP

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Overview

- Motivation
- Roadmap
- Market Drivers
- Product
- Technology
- Resources
  - Funding Structure
  - Multimodal Interface Projects
  - Key Players
- Services and Applications
- Exploitation

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Motivation

Multimedia data can include text, images, audio and/or videos.

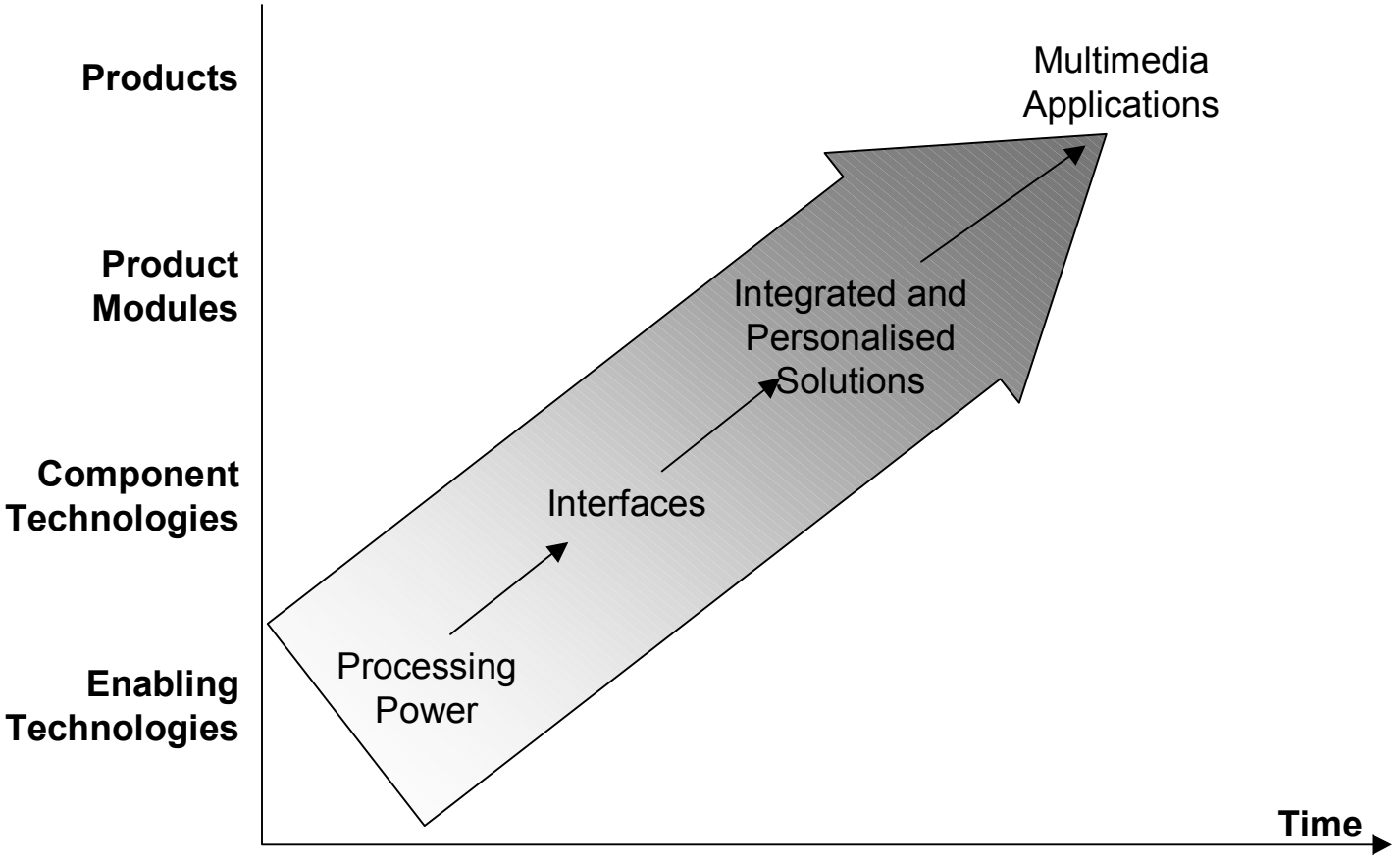
- Multimedia Content - digitisation era
- Technology is fresh and has the capacity for vast improvements
- Fewer technologies have had the same revolutionary effect

Interface Technologies facilitates access to multimedia content.

- Adoption of interfaces that can perceive user needs and adapt accordingly e.g. eye, voice, face, gestures, etc.

Roadmap

- Basic Structure



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Roadmap

- Summary

	Short Term Goals → 2010	Long Term → 2015
Market Social Technological Economic Environmental Political	❑ Information Overload (Internet) - relevancy ❑ Different Languages and Cultures ❑ Copyright and Ethical Issues	❑ Convergence of Technologies ❑ Redefinition of supplier-consumer market relationship ❑ Legislation
Products	❑ Research and Experimental Systems ❑ Interactive Application ❑ Focus on embedding in digital devices - Mobile phones, TV, Internet, etc.	❑ Mass Application of multimedia content management technology ❑ User Interfaces with Intelligent services via WAN and with perceptive user interfaces ❑ Pervasive Interfaces
Technology	❑ Perceptive User Interfaces - Behavioural Unpredictability ❑ Search based on descriptors and features ❑ Network Capability and Speed	❑ Behavioural Models ❑ Search based on semantic meaning ❑ Network security threats
Resources	❑ Funding - EPSRC, EU FP6 ❑ Increase in stipend levels for UK research students	❑ Increased Corporate Investment ❑ Increased number of foreign students (transfer of knowledge)

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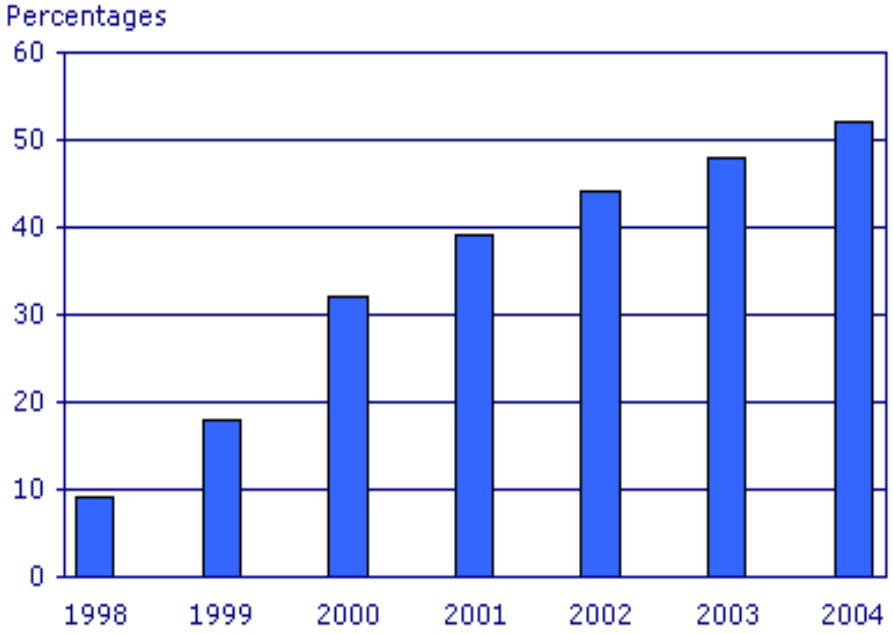
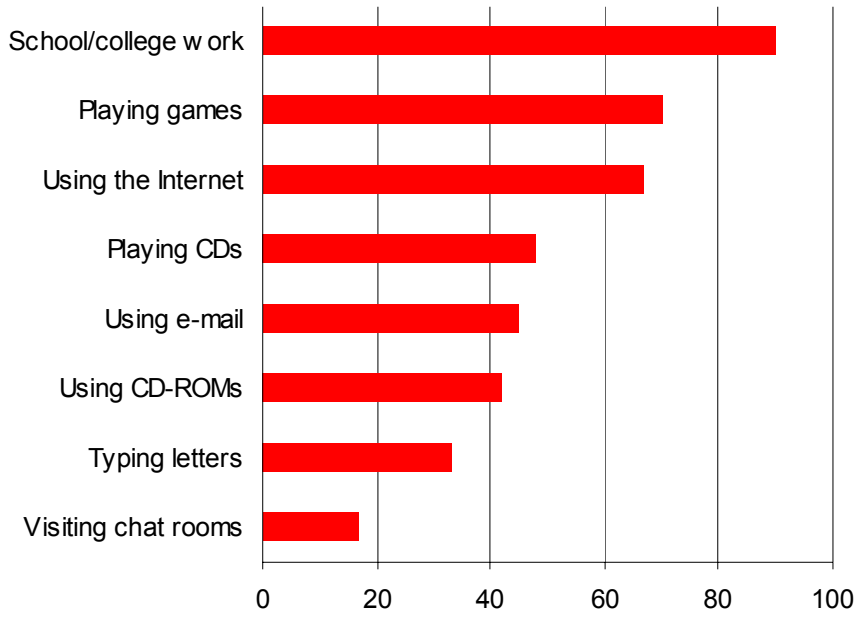
Market Drivers

- UK Internet Access



UK Households with home access to the Internet, July to September (3rd quarter)



Activities undertaken on the computer at home by 11-18 year-olds[1] Autumn 2002, England

[1] More than one reason could be given.

Source: Office of National Statistics

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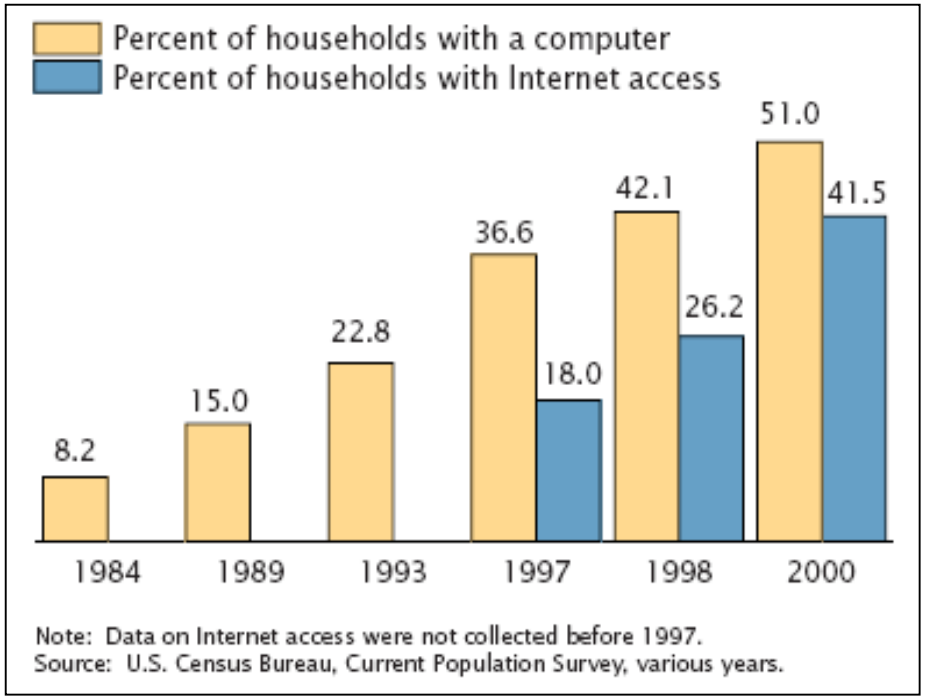
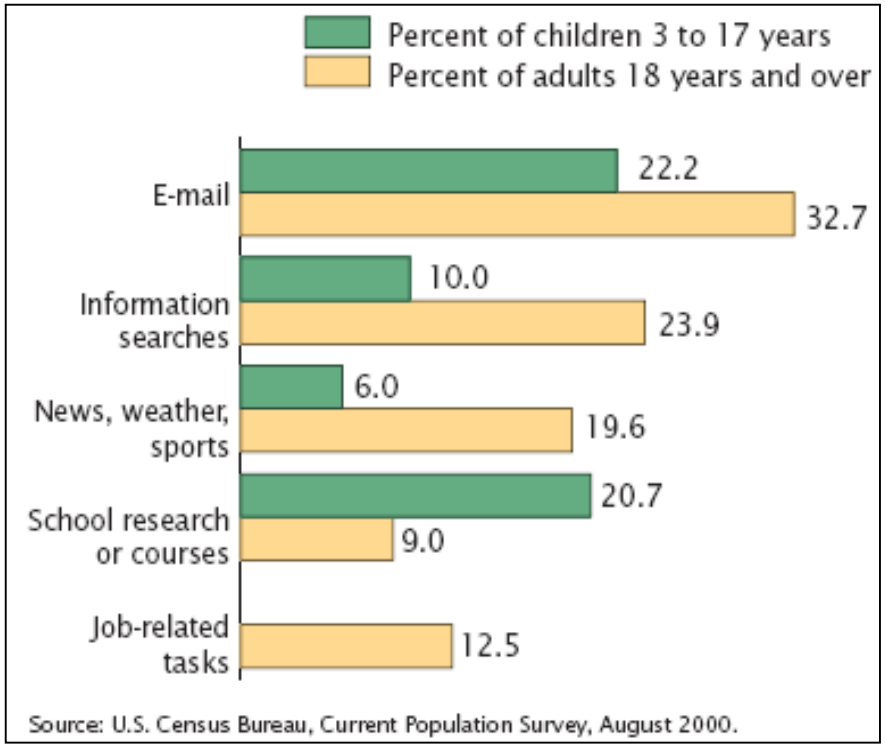
Market Drivers

- US Internet Access



Computers and Internet Access in the Home - 1984 to 2000



Adults and Children Using the Internet for Specific Task - August 2000

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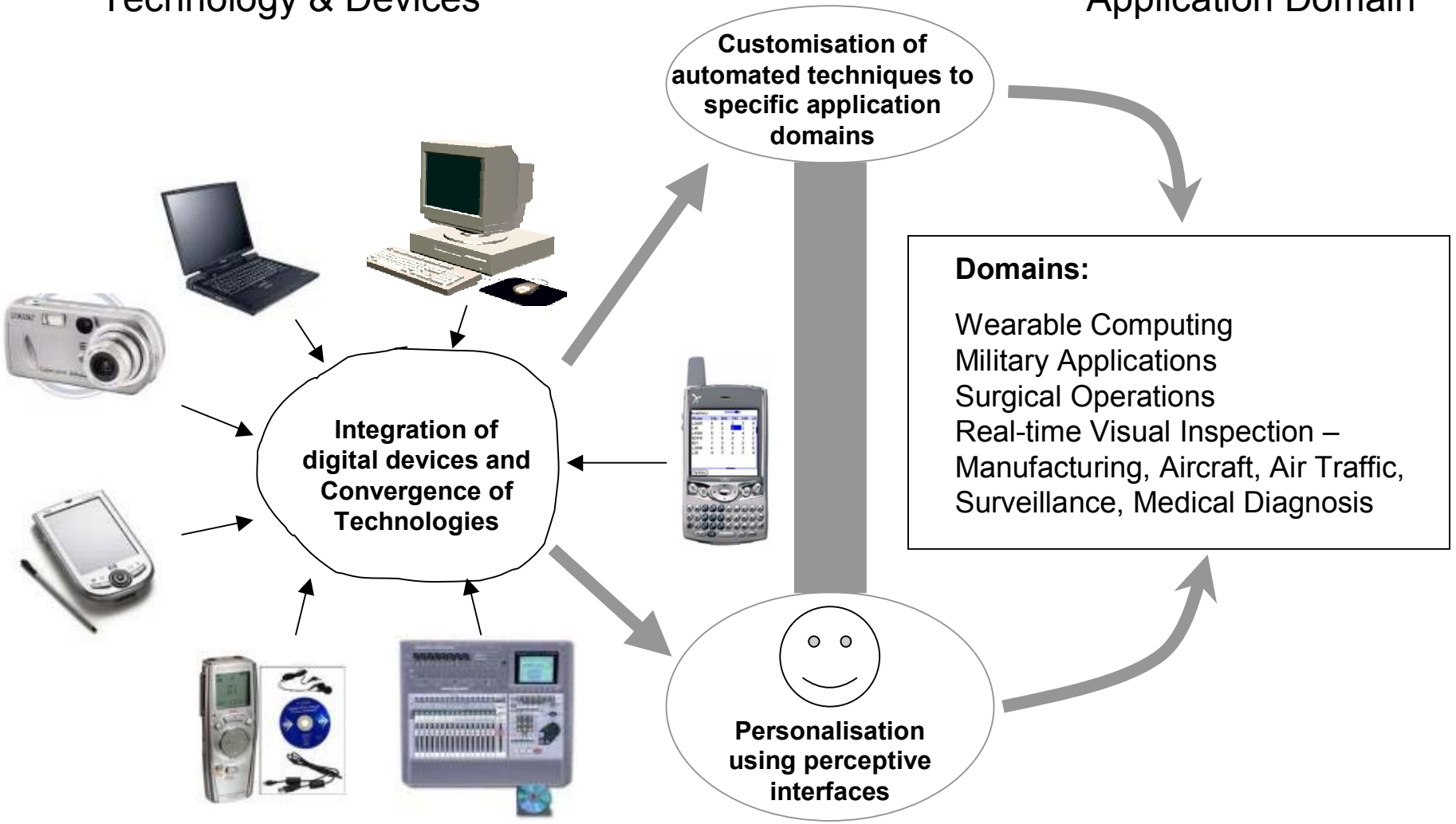
Product

Multimedia - The Big Picture

Technology & Devices → Application Domain



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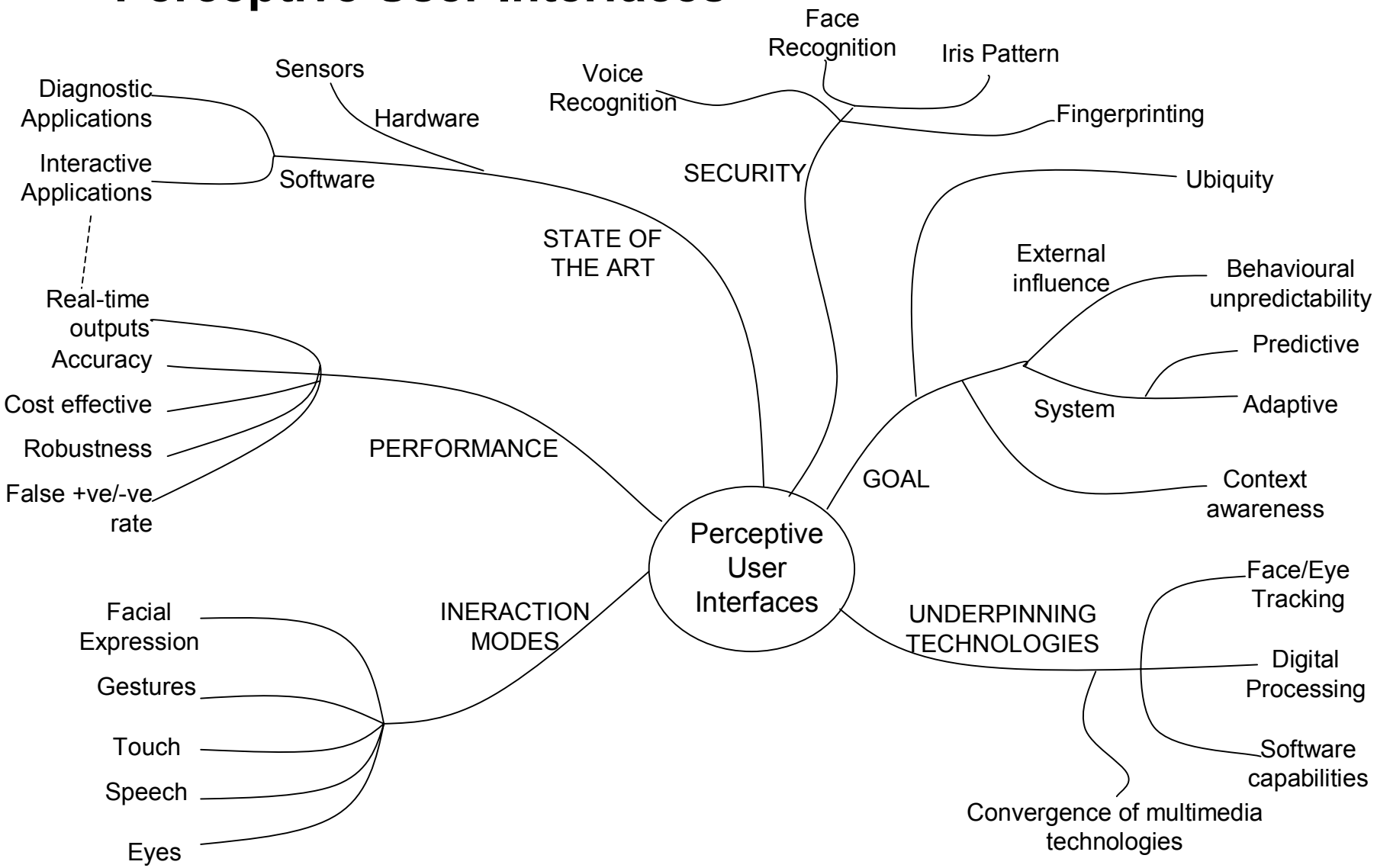
Technology

- Perceptive User Interfaces



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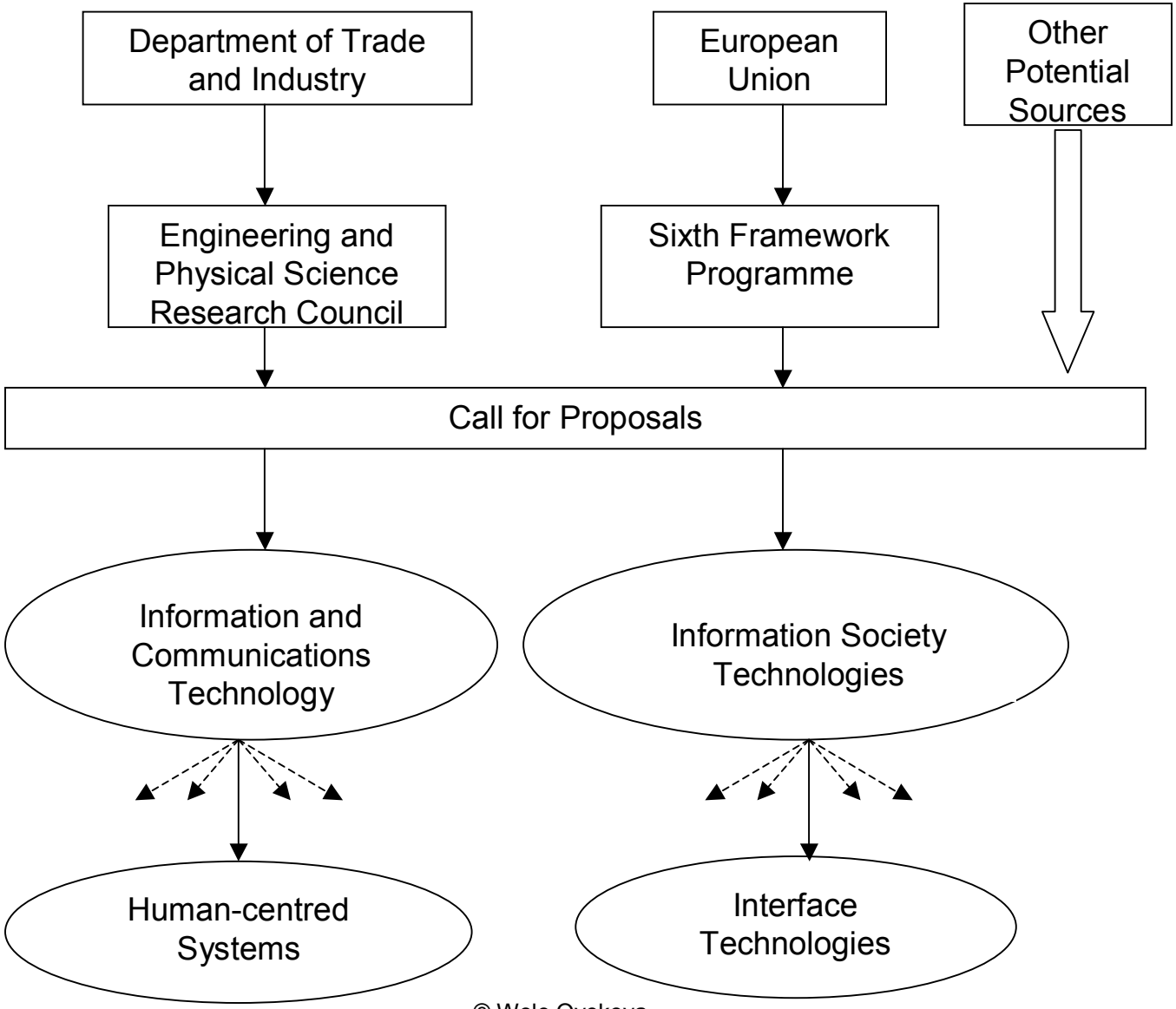
Resources

- Funding Structure



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Resources

- Research Areas

Areas	Strategic Objectives	Indicative pre-allocated budget €M	
Technology Components	Pushing the limits of CMOS, preparing for post-CMOS	75	6.0%
	Micro and nano systems	85	6.8%
	Advanced displays	25	2.0%
	Optical, opto-electronic, photonic functional components	45	3.6%
	Open development platforms for software and services	55	4.4%
Integrated Systems	Broadband for all	60	4.8%
	Mobile and wireless systems beyond 3G	90	7.2%
	Towards a global dependability and security framework	55	4.4%
	Multimodal Interfaces	65	5.2%
	Semantic-based knowledge systems	55	4.4%
	Networked audio-visual systems and home platforms	60	4.8%
	Networked businesses and governments	75	6.0%
	Embedded systems	50	4.0%
	Cognitive systems	25	2.0%
	Applications and Services for the Mobile User and worker	60	4.8%
	Cross-media content for leisure and entertainment	55	4.4%
	GRID-based Systems for solving complex problems	45	3.6%
Sectorial Applications	E Safety of road and air transport	65	5.2%
	eHealth	70	5.6%
	Technology-enhanced learning and access to cultural heritage	65	5.2%
	Improving Risk management	30	2.4%
	eInclusion	30	2.4%

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Multimodal Interfaces

- FP6 IST Priority Area

Objective: To develop natural and adaptive multimodal interfaces that respond intelligently to speech and language, vision, gesture, haptics and other senses.

Projects funded under the 6th framework programme

Projects	Description
1. AMI	Augmented Multi-party Interaction
2. CHIL	Computers In the Human Interaction Loop (CHIL)
3. DIVINES	Diagnostic and Intrinsic Variabilities in Natural Speech
4. ENACTIVE	Enactive interfaces
5. HIWIRE	Human Input that Works In Real Environments
6. HUMAINE	Human-Machine Interaction Network on Emotion
7. MWEB	Multimodal Web Interaction
8. PASCAL	Pattern Analysis, Statistical Modelling and Computational Learning
9. SIMILAR	The European research taskforce creating human-machine interfaces SIMILAR to human-human communication
10. TAI-CHI	Tangible Acoustic Interfaces for Computer-Human Interaction
11. TALK	Talk and Look, Tools for Ambient Linguistic Knowledge
12. TC-STAR	Technology and Corpora for Speech to Speech Translation
13. T'N D	Touch and Design

Key Players

Projects	Funding (Cost) (Million €)	Major Companies Involved
1. AMI	8.8 (16.82)	Philips Electronics Netherlands
2. CHIL	15 (23.44)	Diamler Chrysler Germany IBM Czech Trentino Cultural Institute, Italy
3. DIVINES	2.2 (3.63)	Multitel Belgium France Telecom
4. ENACTIVE (NoE)	5	Sony France
5. HIWIRE	1.8 (2.8)	Thales Avionic France
6. HUMAINE (NoE)	4.95	France Telecom
7. MWEB	0.955 (1.24)	W3C
8. PASCAL (NoE)	5.44	Xerox France
9. SIMILAR (NoE)	6.05	France Telecom
10. TAI-CHI	2.35 (3.31)	-
11. TALK	4.40 (5.71)	BMW Germany
12. TC-STAR	10.99 (18.44)	Trentino Cultural Institute, Italy Siemens Germany IBM Germany Siemens France Nokia Finland Sony Germany
13. T'N D	2.22 (3.4)	-

NoE: Networks of Excellence

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Services and Applications

- Multimedia Messaging Services (MMS) - 3G
- Face-Tracking Auto-Focus feature in Nikon COOLPIX 7900, 5900 and 7600 Compact Digital Cameras
- Military Applications - Eye Tracking for target tracking (Dept of Defence)
- Disabled Application - Automatic Sign Language (eSign)

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Exploitation

- Interface Technologies have been identified as a priority research areas by National and European funding and also evident by the involvement of key players like France Telecom, IBM, Sony, Siemens, etc.
- Future Applications include:
  - Multimodal web access using mobile devices
  - Personalised information retrieval using perceptive interfaces on desktop computers
- The driver for any organisation's technological and research plan should be integration and personalisation (customisation) of multimedia content management (key to maximising this revenue generating capability).
- Core enabling technology: modelling behavioural unpredictability.

Exploitation

Current Work:

- New Query Interfaces (Visual Input)
- Eye Tracking data may yield new information for a more efficient and effective CBIR interface.

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Exploitation

- Identify gaze behaviour that can be used in visual search;
- Investigate algorithms that identify interest from saccades and fixations;
- Results from recent experiment show that the eye is faster than the mouse during visual search tasks;
- Work is ongoing on generating a search behavioural model for searching a CBIR database.

THANK YOU