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Service Industrialization and the Global Information Economy

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Evolving Economies

- Economies around the world continue to evolve at a tremendous pace
- The major trends
 - A continuing shift to services
 - The new shift to information economies
 - Waking giants; growing rapidly
 - Changes in tariffs and multi-lateral agreements
 - Huge shifts in trade and global commerce
- What does this mean for the Decision Sciences? For educators and professionals?

UCLA Business and Information Technologies (BIT) Project

- **Global survey of industry practices** (actual)
 - CIO's, CTO's, Senior Information Officers
- **GNP studies of economic evolution by country**
- **Sector studies of key industry sectors**
 - Interviews, cases, data bases
- **Study of the labor and employment impact of outsourcing, off-shoring and automation**
- **Global research partners** (leading institutions) in
 - Sweden, Germany, Italy, India, Spain, Korea, Chile, France
 - Argentina, UK, Japan in discussion
 - To add: China, Russia, Mexico, Indonesia, MENA

Sector Studies: Technology Impact on End-to-end Value Chain

- Financial services
 - **Retail banking**
 - **Insurance**
 - **Mortgage banking: origination, securitization and servicing**
- Entertainment and Media
 - **Film, TV and Video: distribution technologies**
 - *New business models for video products (with Entertainment/Media Center, UCLA)*
- Telecommunications and related services
- Publishing
 - **Electronic publishing; technical and legal**
- Retail
 - **Business continuity planning (funded by AT&T Foundation)**
 - *RFID implementation (projects with WINMEC, UCLA Engineering)*
- Health care
 - *Quality of care, decisions, data mining (with VA, UCLA Med School, Rand Corp)*
- Electronics, Discrete Manufacturing, Supply Chain, Government, Education,, National Security, Business Services, Tourism, Hospitality/Leisure

The Information Economy

- All industry sectors that address the eventual production of information goods and services
- Including
 - Pure information goods: data bases, books
 - Information services: news broadcasts
 - Transactions services: financial services
 - Experiential information goods: music
 - Knowledge based professional services
 - Information transportation: telecommunications
 - Information processing tools: computers

Picturing Economic Evolution

Delivery Form

Products

Services

Material

Steel, Cement
Automotive
Consumer Goods

Restaurants
Retailing
Construction

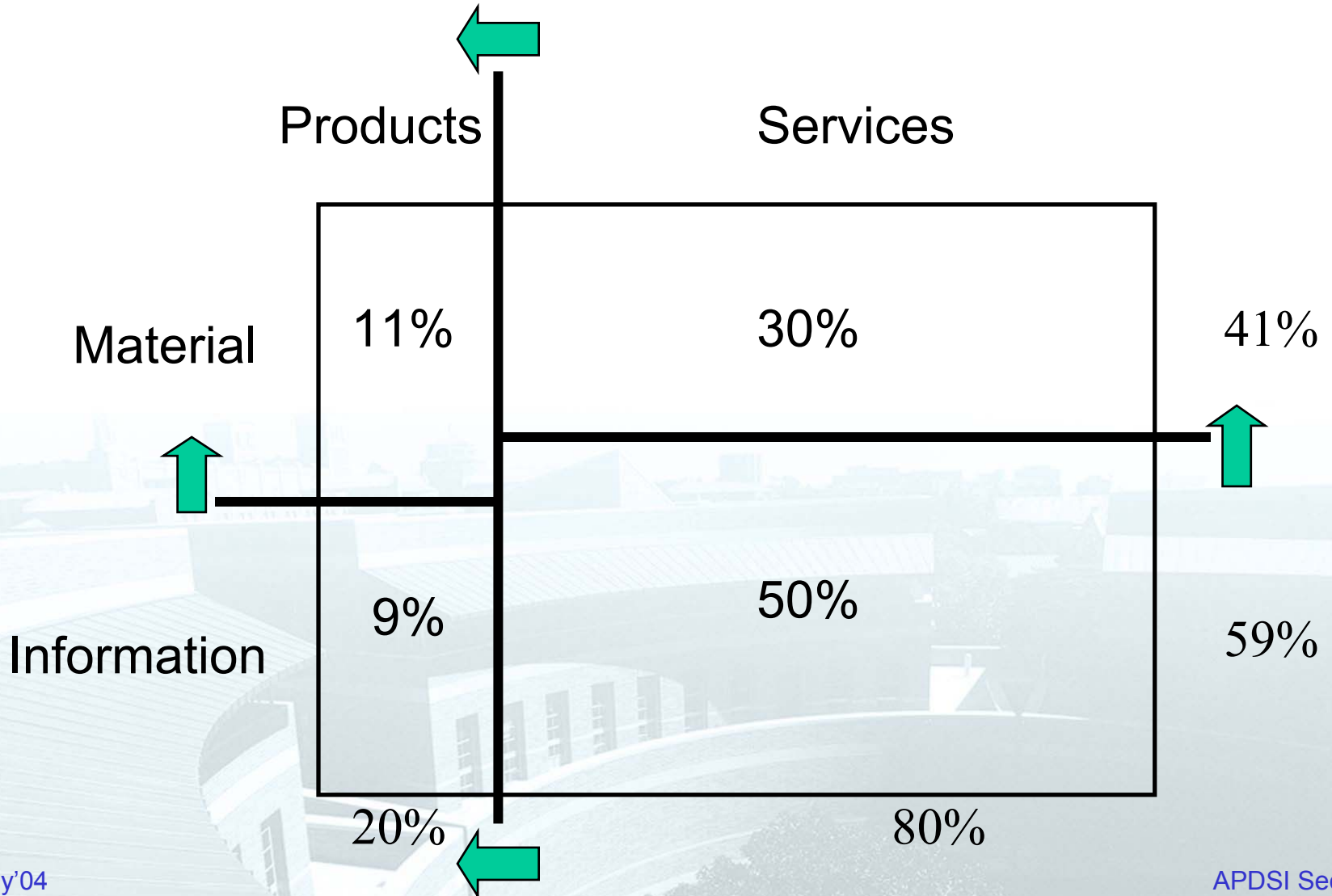
End product

Information

Computers
Books, Magazines
Newspapers
Music CD's

Telecommunications
Television
Education
Consulting

The US Economy



The New US Economy

- The US is now an “information economy”
- Information sectors comprise about 60% of the GNP value added by the private sector
- Information Services are 50% of the total
- Manufacturing continues to shrink
- **The result: information services (consumer and industrial) dominate the US economy**
- **This trend applies to all economies (though at different rates and levels)**

Trends and Drivers

- Manufacturing to services shift
- Manufacturing productivity growth
- Most people are employed in services
- **The new shift: from a material economy to an information economy**
- Globalization continues – with new forms and new players in new sectors
- **Technology: information technologies leading to industrialization of services**

Operations and Decision Sciences

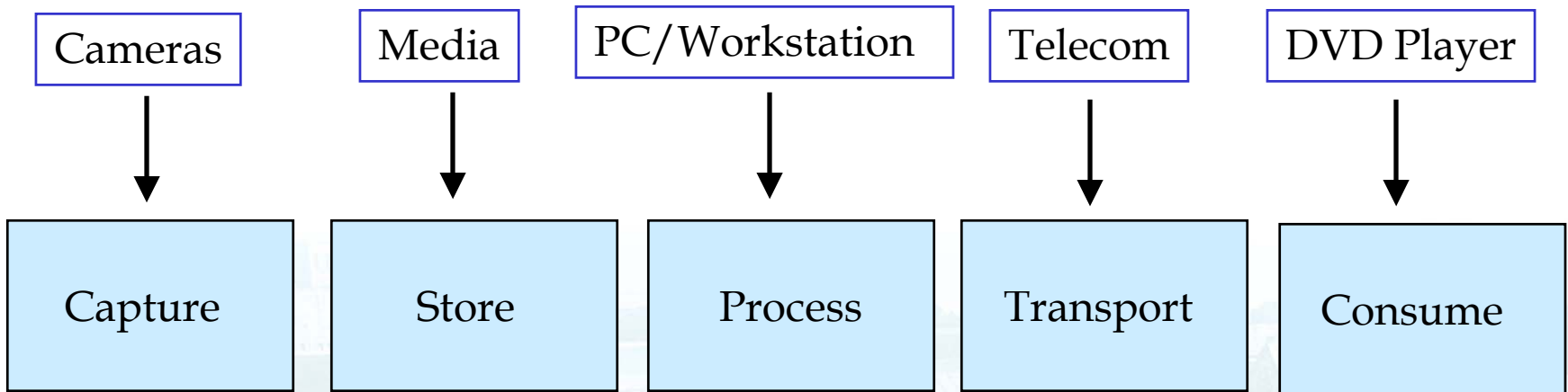
- Modeling processes and chains for information products and services
- Modeling process economics for information and service sectors
- Intelligent systems and decision support for service industries
- Impact of technologies on process economics and process design
- Competition and restructuring of industries
- Planning and operating decisions in information product and service sectors

Information Products

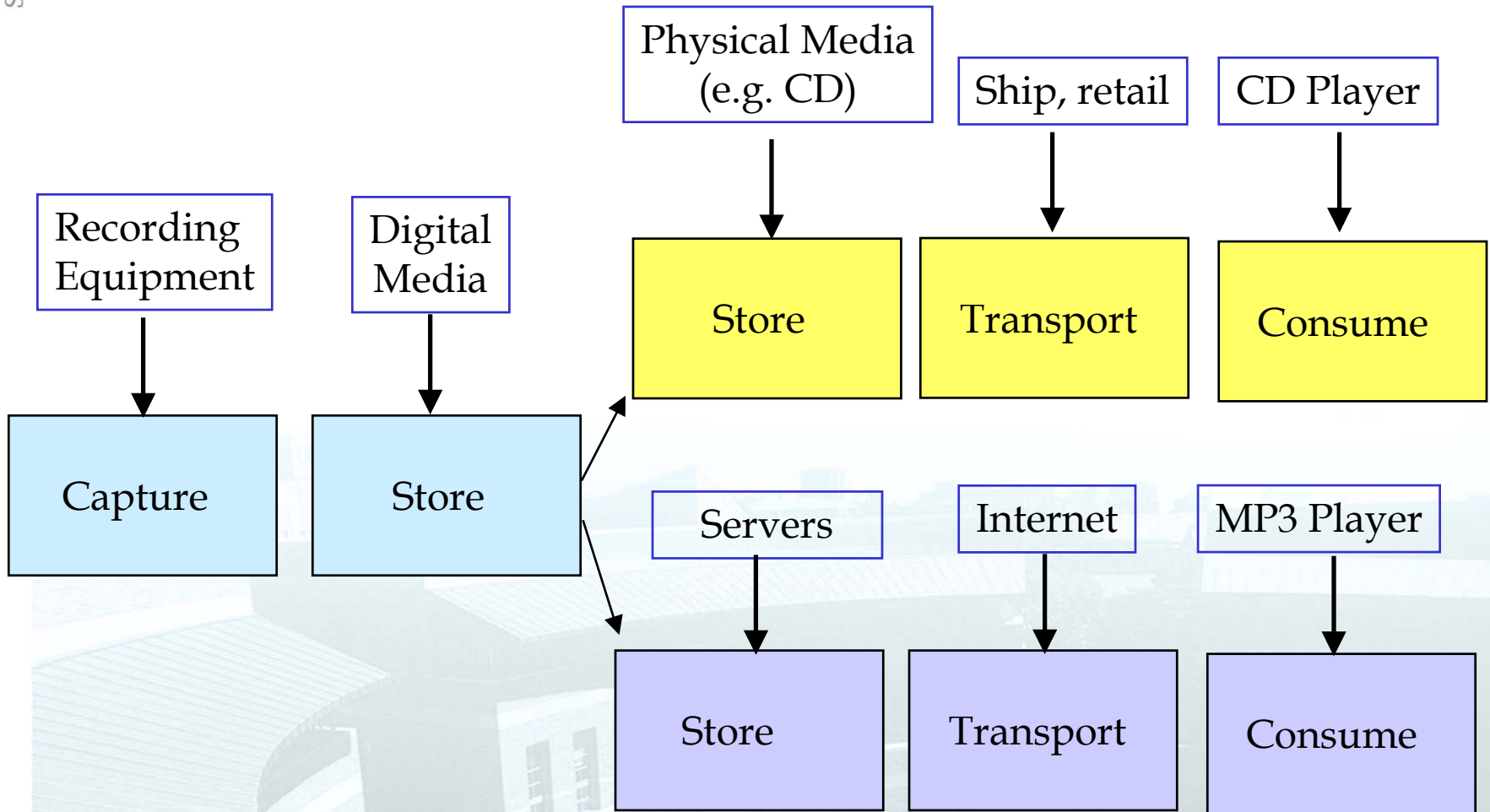
	Products	Services
Material	Steel, Cement Automotive Consumer Goods	Restaurants Retailing Construction
Information	Computers Books, Magazines Newspapers Music CD's	Telecommunications Television Education Consulting



Technology in Information Chains



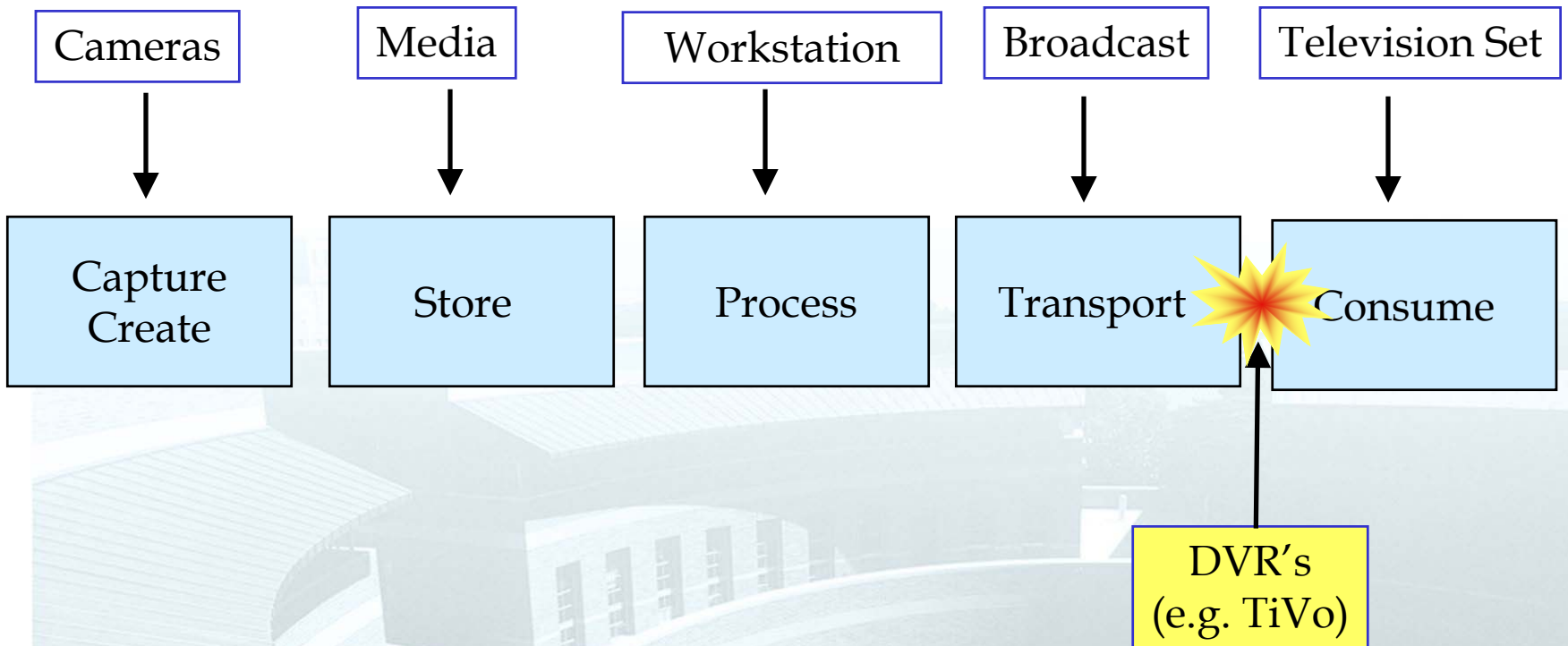
Music Distribution



Reconstruction of Info Product Chains

- Logistics transformed by digital distribution
- Traditional distribution dominance is destroyed (publishing, newspapers, TV)
- First copy, second copy economics threaten IP value (P2P barter, copying, and theft)
- Appliances, services influence distribution (Apple, Sony, iMode, SK Telecom)
- Products morph into services

Example: TV Broadcasting



Rethink Business Models

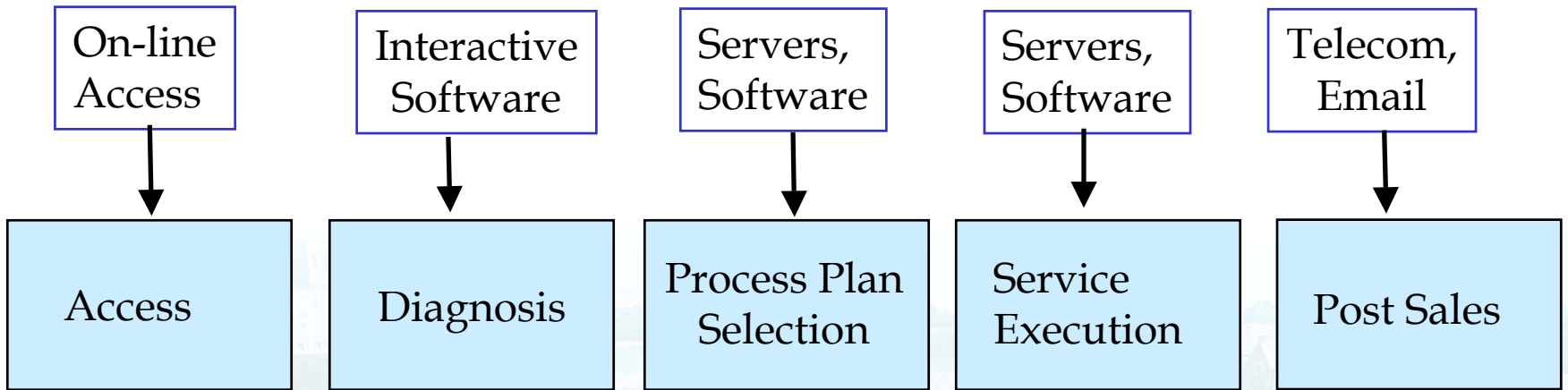
- Attention capture changes with technologies
- New business models are required
- DVR's could destroy traditional broadcasting
- Recall that TV broadcasting destroyed movies (though no one seems to know that)
- P2P and theft problem is huge for movies
- New models? Changed video products, different revenue mechanisms, bundling

Information Services

	Products	Services
Material	Steel, Cement Automotive Consumer Goods	Restaurants Retailing Construction
Information	Computers Books, Magazines Newspapers Music CD's	Telecommunications Television Education Consulting



Technologies in Information Services



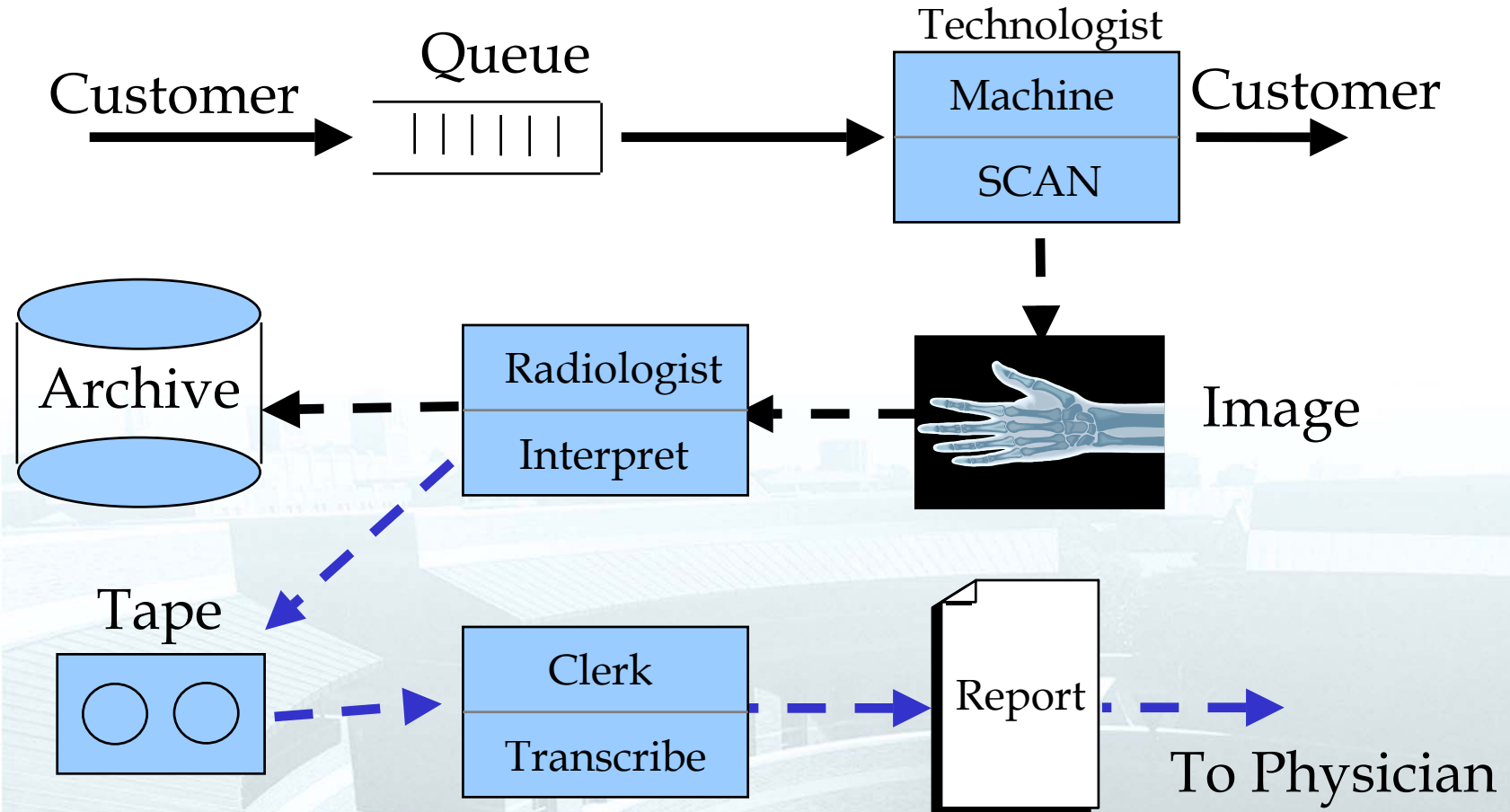
Properties of Services

- Intangible output ; hard to quantify
- No inventories or pre-production
- Lack of portability
- Simultaneous production, consumption
- Customer is “on-line”
- Customer may be a co-producer
- Complex specifications

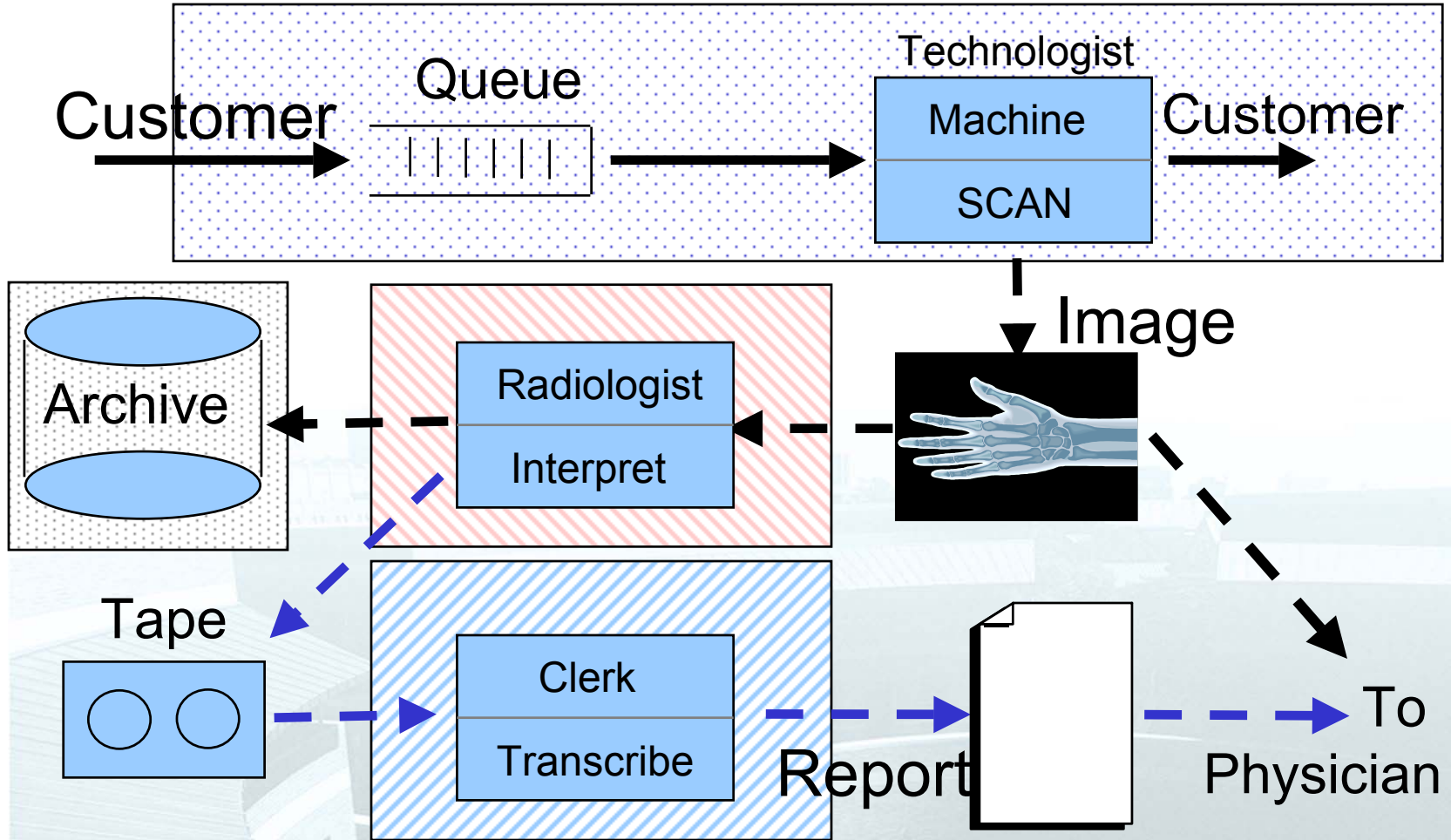
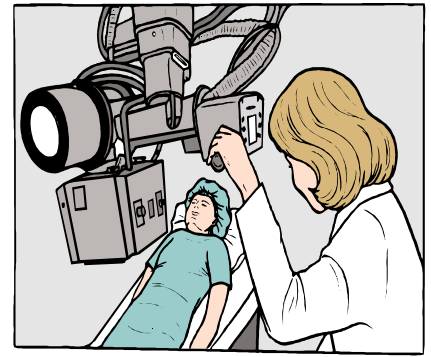
Information services: when is a service not quite a service?

- **Preproduction:** broadcasting, web-sites
- **Tangible output:** data-bases, content delivery
- **Portability:** fax, phone, tapes, CD's, FTP
- **Remote access:** telephone, web, Internet
- **Customer presence:** automation, agents
- **Requirements specs;** quality control: feasible
- **Customer co-production:** YES! increased

Diagnostic Imaging



Decoupled Processes



Outsourcing, De-integration

- Outsourcing of scans – being done
- Outsourcing of diagnosis – being done
- Automation of diagnosis? Coming
- Off shore diagnosis? Starting
- Off shore, outsourced transcription – done
- Digital distributed archiving – being done
- Loss of lock-in: referring physicians can read the images

Service Industrialization

- What is “industrialization”?

- Standardization of products and functionality
- Standardization of components and piece parts
- Standardization of work processes
- Ability to specify and test output requirements
- Ability to package and ship output

- Additional factors

- Low cost, reliable logistics (bandwidth)
- Diffusion of capabilities and technology
- Competition drives innovation, productivity

Service Transformation

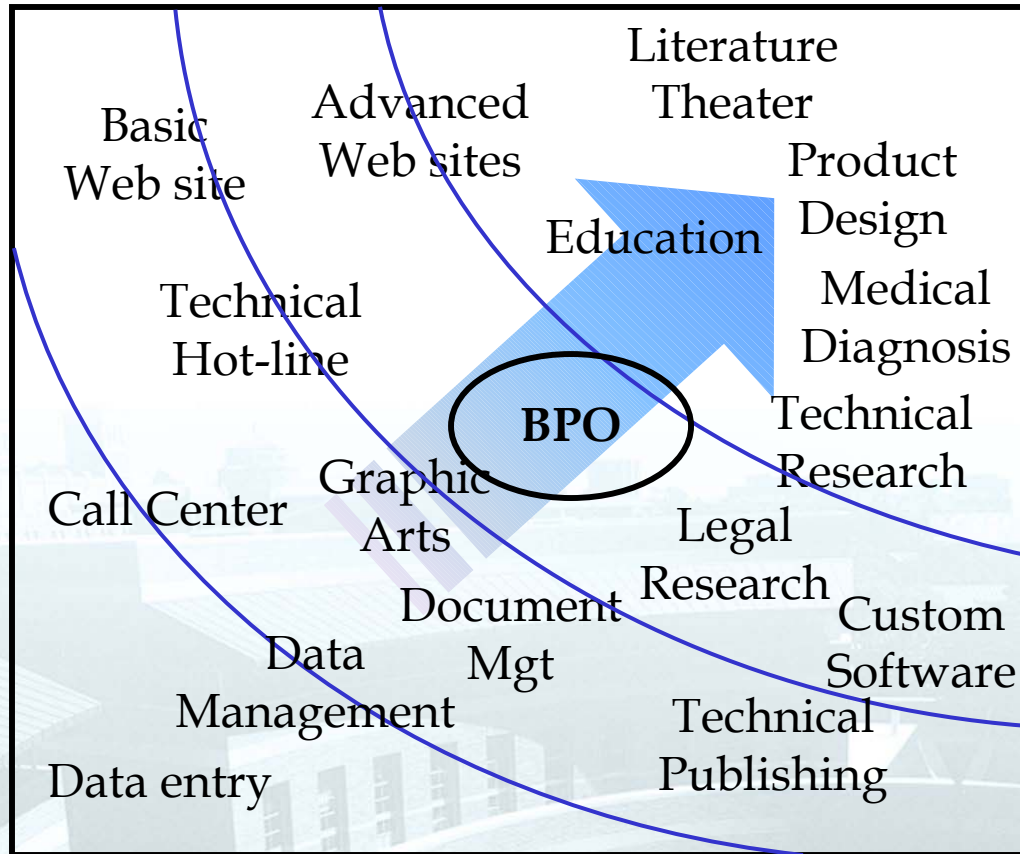
- Technology driven
- Like manufacturing in the 70's
 - **Automation**
 - **Out-sourcing and virtualization**
 - **Off-shore sourcing**
 - **Global competition**
- And...
 - **Self service** (shift process to the consumer)

Global Information Chains

- Advances in information logistics permit globalization of information chains; trade
- Initially: simple data entry and data processing
- Evolving: information and knowledge based areas; content management and creation
- Topology of these chains is determined by
 - Task complexity, interactivity
 - Language and culture similarity
 - **Labor costs** (hardware, logistics are irrelevant)

IT-enabled Services

Custom
Specialized
Interactive
Cultural



Commodity
Standard
Technical
Off-line

Simple

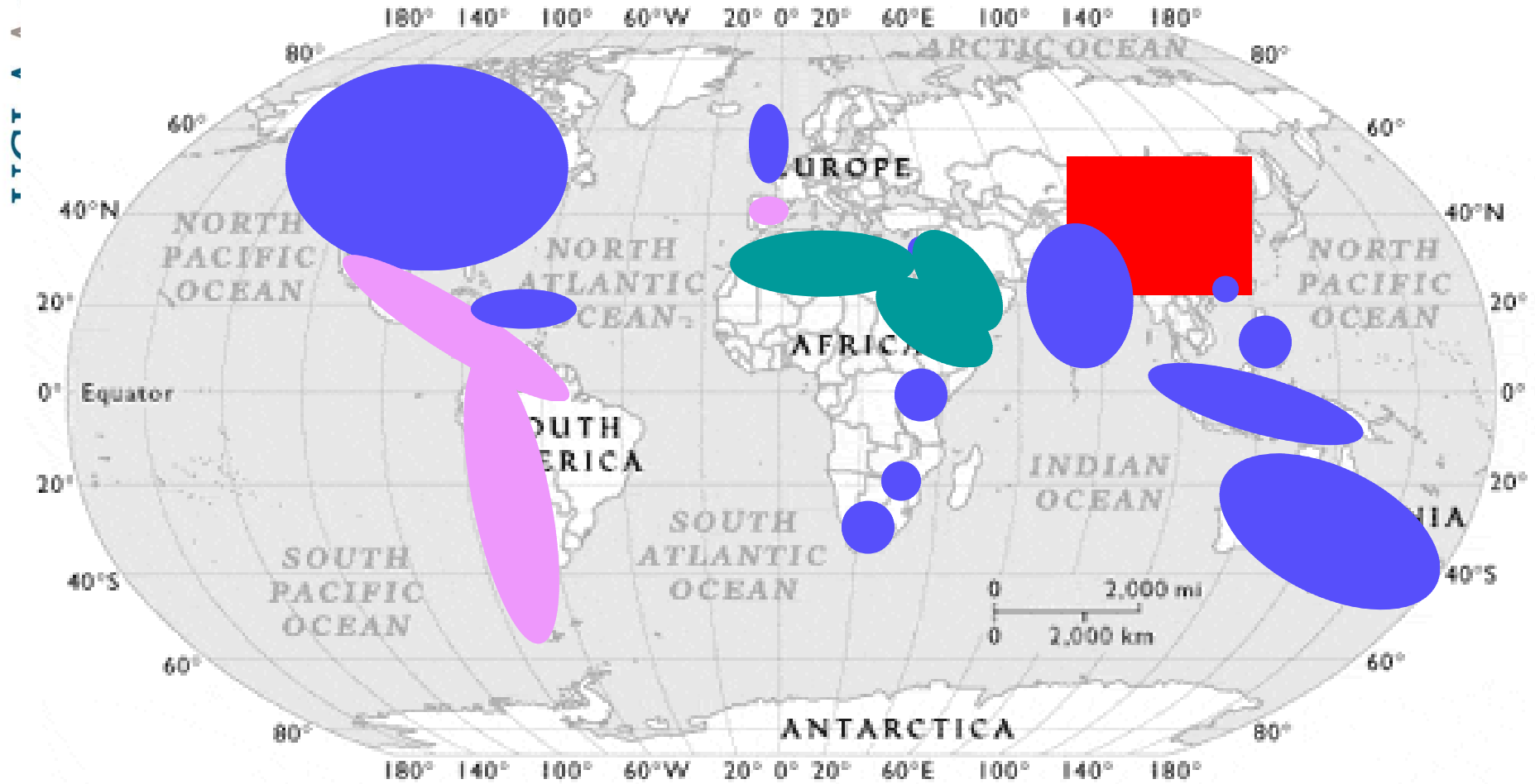
Complex

Most Widely Spoken Languages

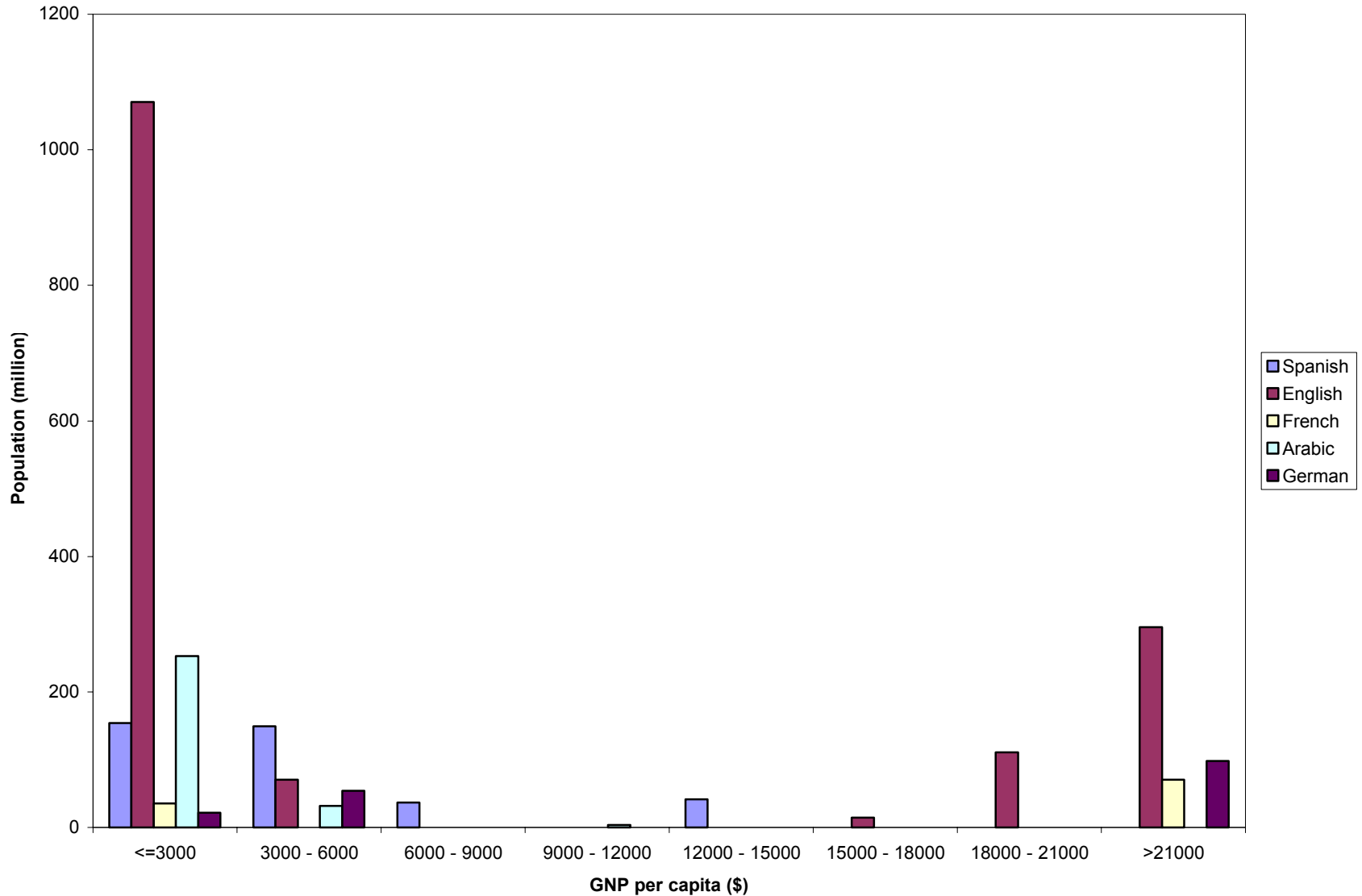
Language	Approx. number of speakers
1. Chinese (Mandarin)	1,075,000,000
2. English	514,000,000
3. Hindustani	496,000,000
4. Spanish	425,000,000
5. Russian	275,000,000
6. Arabic	256,000,000
7. Bengali	215,000,000
8. Portuguese	194,000,000
9. Malay-Indonesian	176,000,000
10. French	129,000,000

Source: *Ethnologue*, 13th Edition and other sources.

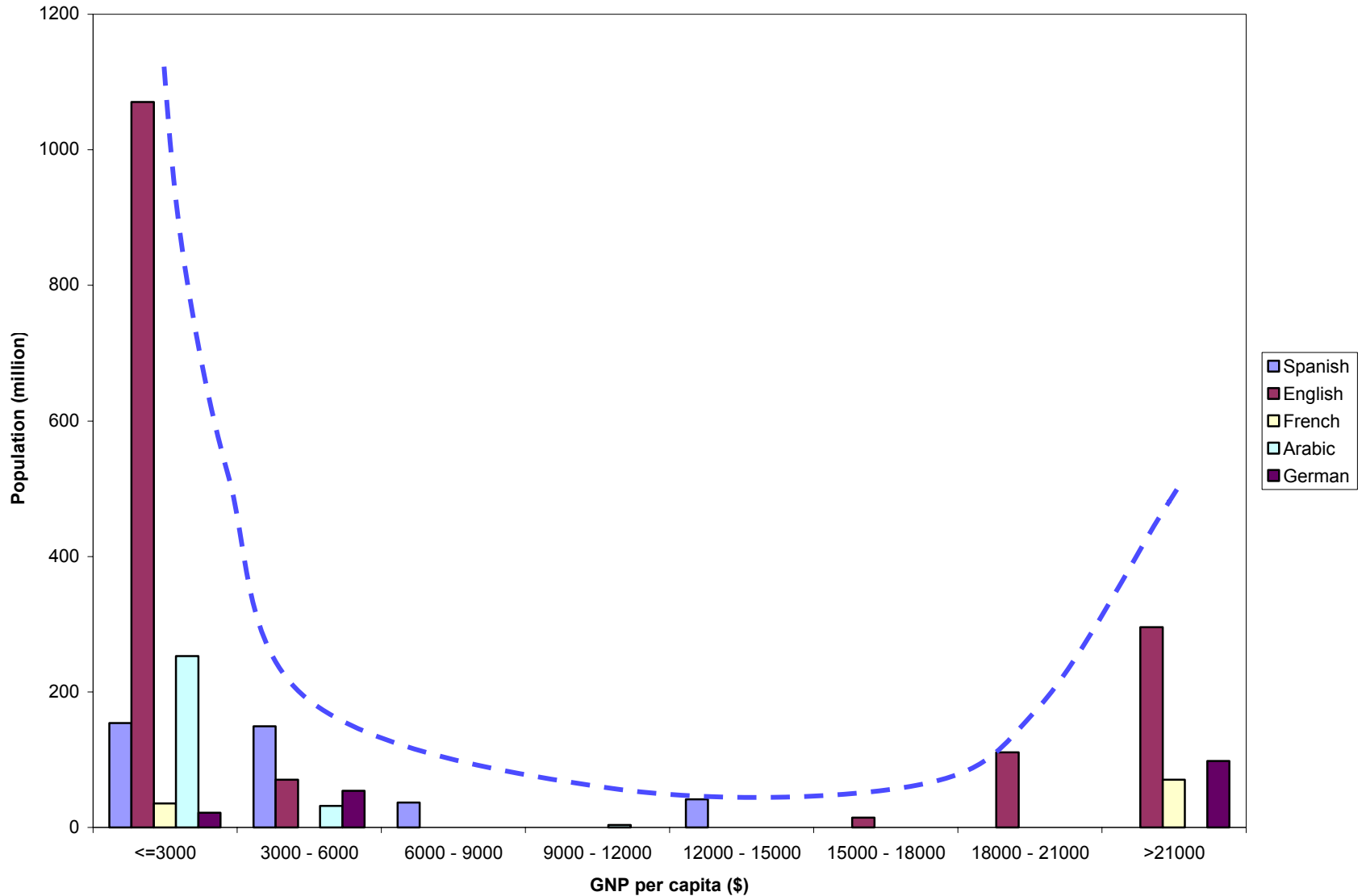
English / Spanish Arabic & Chinese Language Footprints



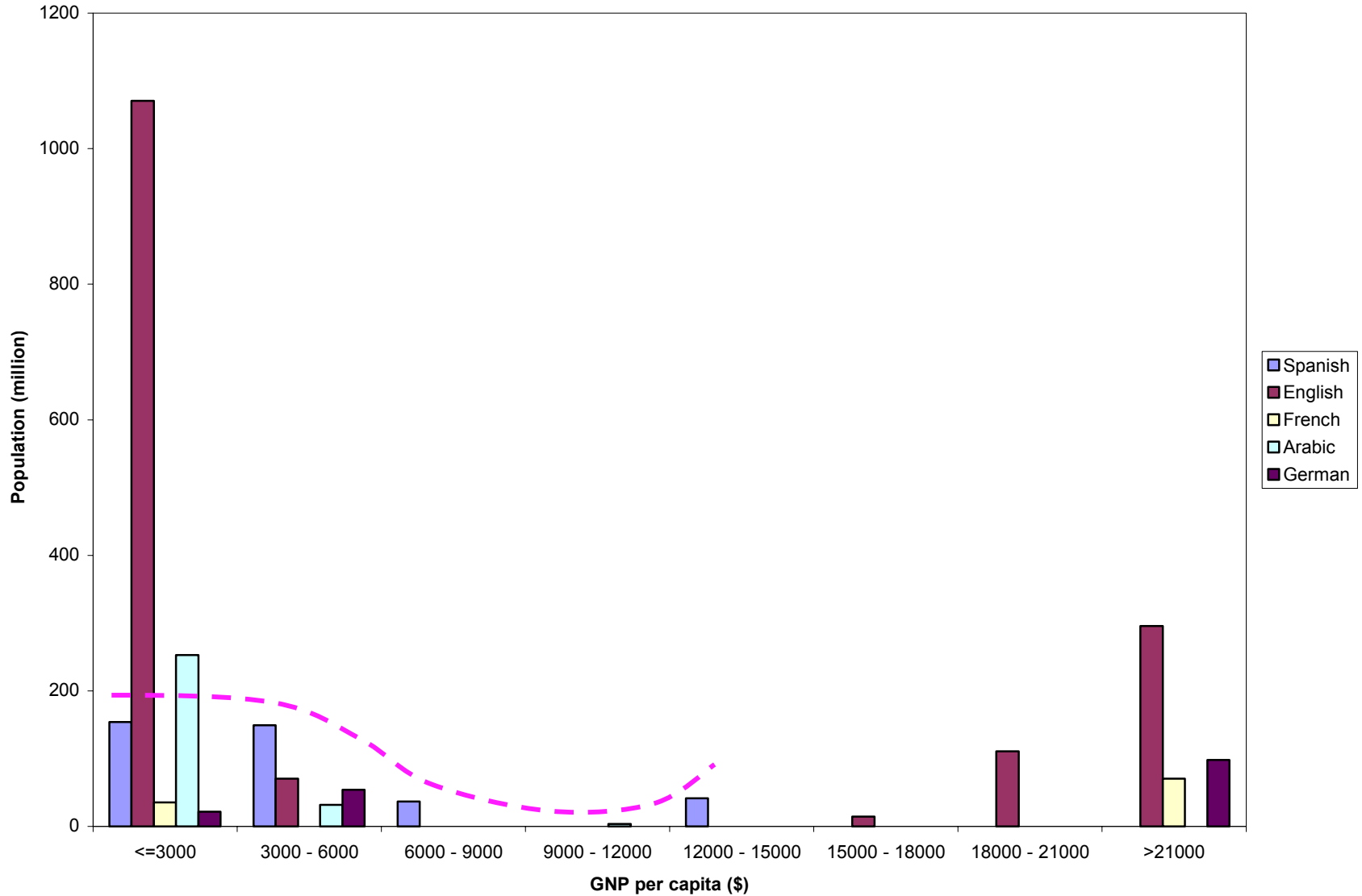
Major Language Groups (per capita GNP and Population)



The English World



The Spanish World



Globalization of Services

- Increasing degree of globalization
- Linguistic/cultural patterns, colonial history
- Largest linguistic markets: **English (open)**, Chinese (localized), Spanish (open), European languages (localized), Arabic (localized), Indian languages (localized)
- Simpler commodity services globalize first
 - Logistics oriented; telecom
 - Basic services: search
 - Transaction oriented: banking and financial

Key Takeaways

- The shift to the “information economy”
- Information services: the key sector
- Information commercialization is advancing from data to knowledge and experience
- New challenges for service management: old experience doesn’t work
- Substantial impacts on globalization, trade, industry structure, and employment
- The structure of information services trade follows linguistic and colonial patterns

Thank you

