The Use of ICT for Improving Knowledge Communication and Knowledge Management for Better Economic Development:

The Data Mining Techniques

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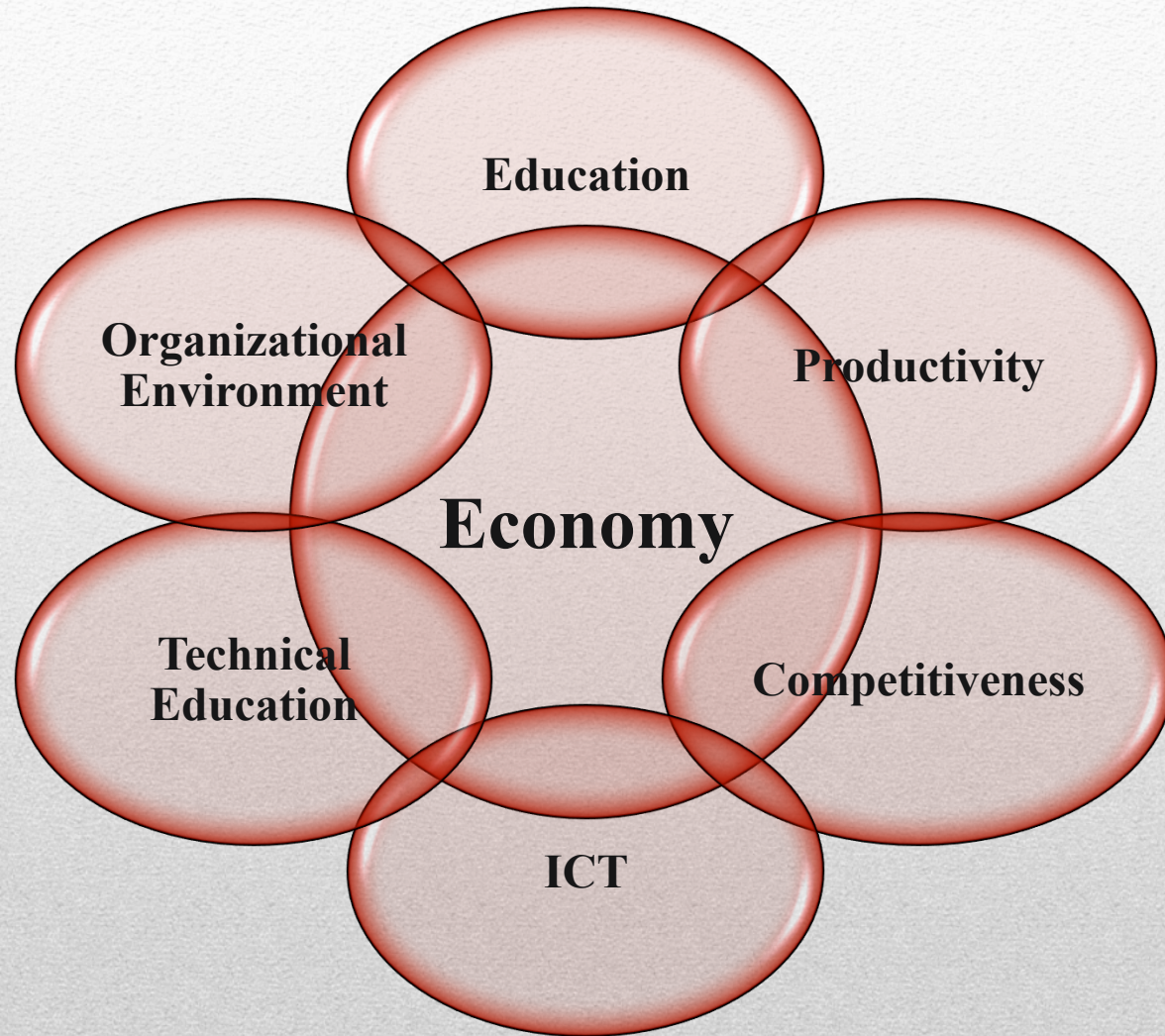**Dr. Mansoor Alaali, The Use of ICT for Improving Knowledge Communication & Knowledge Management for Better Economic Development: The Data Mining Techniques**

2

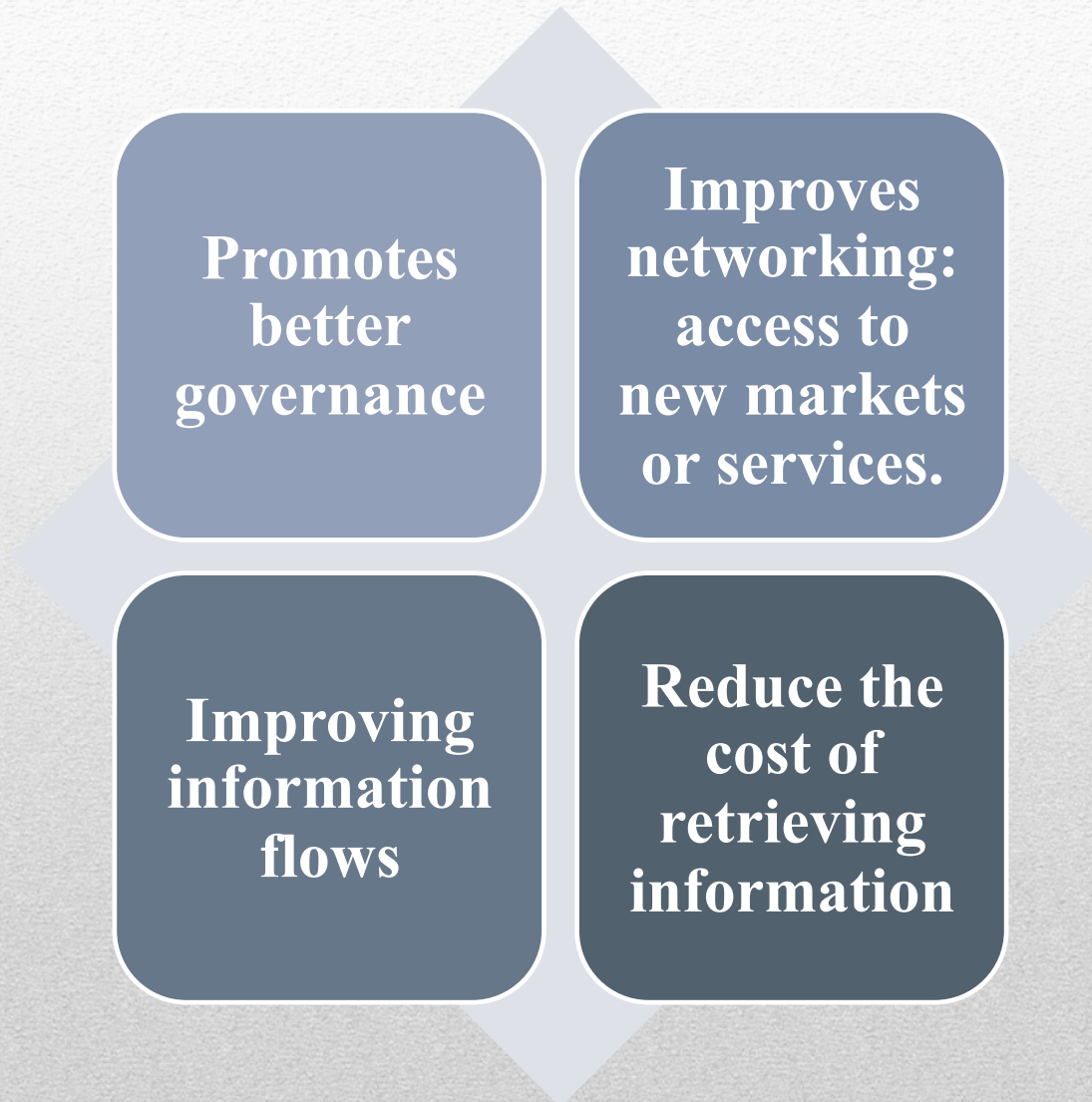# IT in Economic Development

Economic & Social Development Era

Information Technology

Communication Technology

Industrial Era

Electricity

Productivity Increase with Improved ICT Infrastructure

Promotes better governance

Improves networking: access to new markets or services.

Improving information flows

Reduce the cost of retrieving information

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4

ICT Infrastructure & Economy

- Creates production facilities and stimulates economic activities.

- Reduces transaction costs and trade costs thus improving competitiveness.

- Provides employment opportunities to the poor.
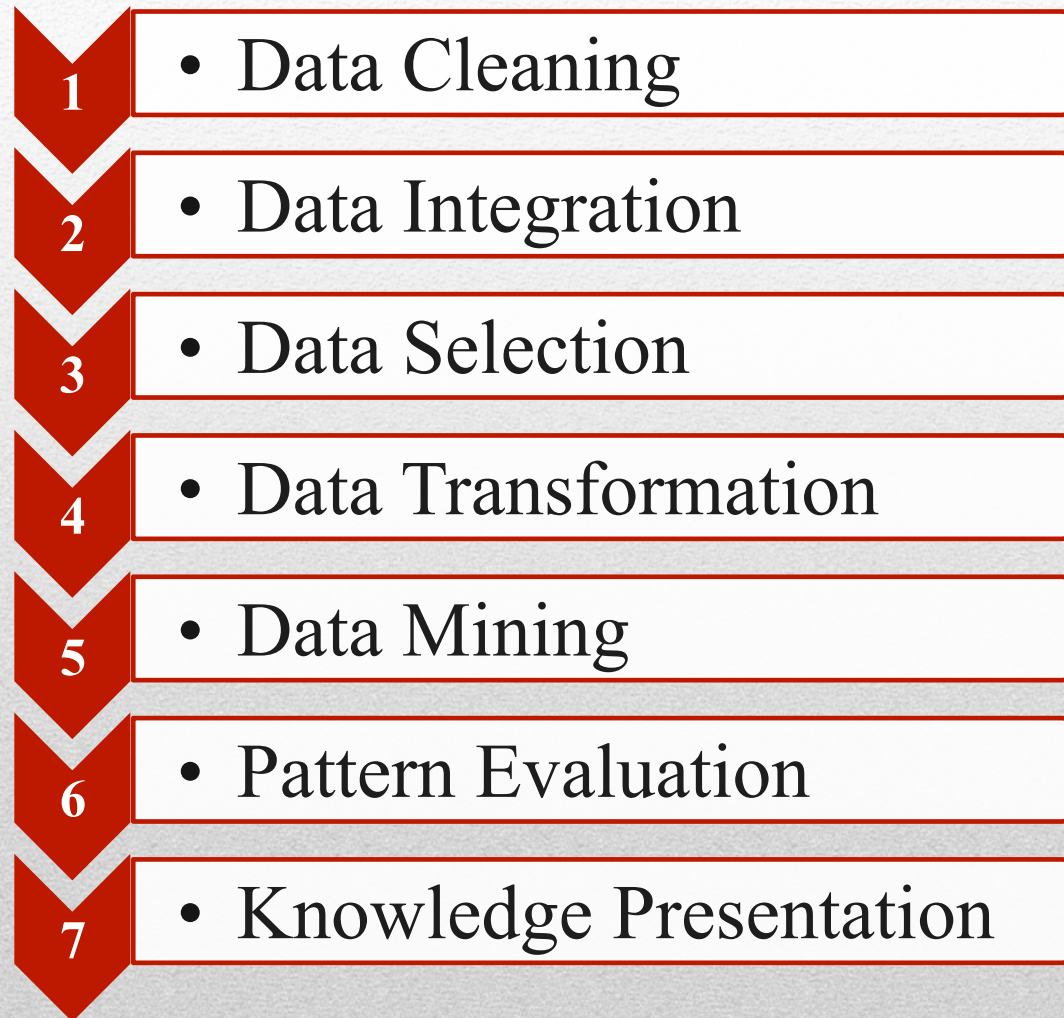
- Plays a role in development goals.

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5

Knowledge

Knowledge is the ability of an actor to respond to a body of facts and principles accumulated over a period of time.

Data	Information	Knowledge

Knowledge Management is to harness, develop and direct the expertise of the organization and to apply it effectively to achieve strategic objectives.

Knowledge Management encourages learning and innovation as sources of competitive advantage

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6

Knowledge Discovery Process

1. • Data Cleaning

2. • Data Integration

3. • Data Selection

4. • Data Transformation

5. • Data Mining

6. • Pattern Evaluation

7. • Knowledge Presentation

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7

ICT - Two-edged Sword

Leapfrog Stages of Economic Growth

Cumulative Retardation

Modernize Production systems

No capacity of the whole society to be educated, and to be able to assimilate and process complex information

Increase Competitiveness

Eg., Asian Pacific economies: Hong Kong, Taiwan, Singapore, Malaysia &South Korea

Cultural Development

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8

Data Mining

The process of discovering interesting knowledge from large amounts of data.

- **Patterns**

- **Associations**

- **Changes**

- **Anomalies**

- **Structures**

Data Mining Applications

Data Mining

Financial Institutions
- Increase sales, reduce costs, improve market performance, enhance customer base.

Retailers
- Assess effectiveness of product selection, placement decisions, coupon offers & products that are purchased together.

Pharmaceutical firm
- Guide the research on new medicines or treatment of diseases.

ISP
- Assess subscribers and strength of competitors.

Public Sectors
- detecting fraud, waste, measuring and improving performance, predicting crime patterns, identifying terrorists, controlling aviation traffic.
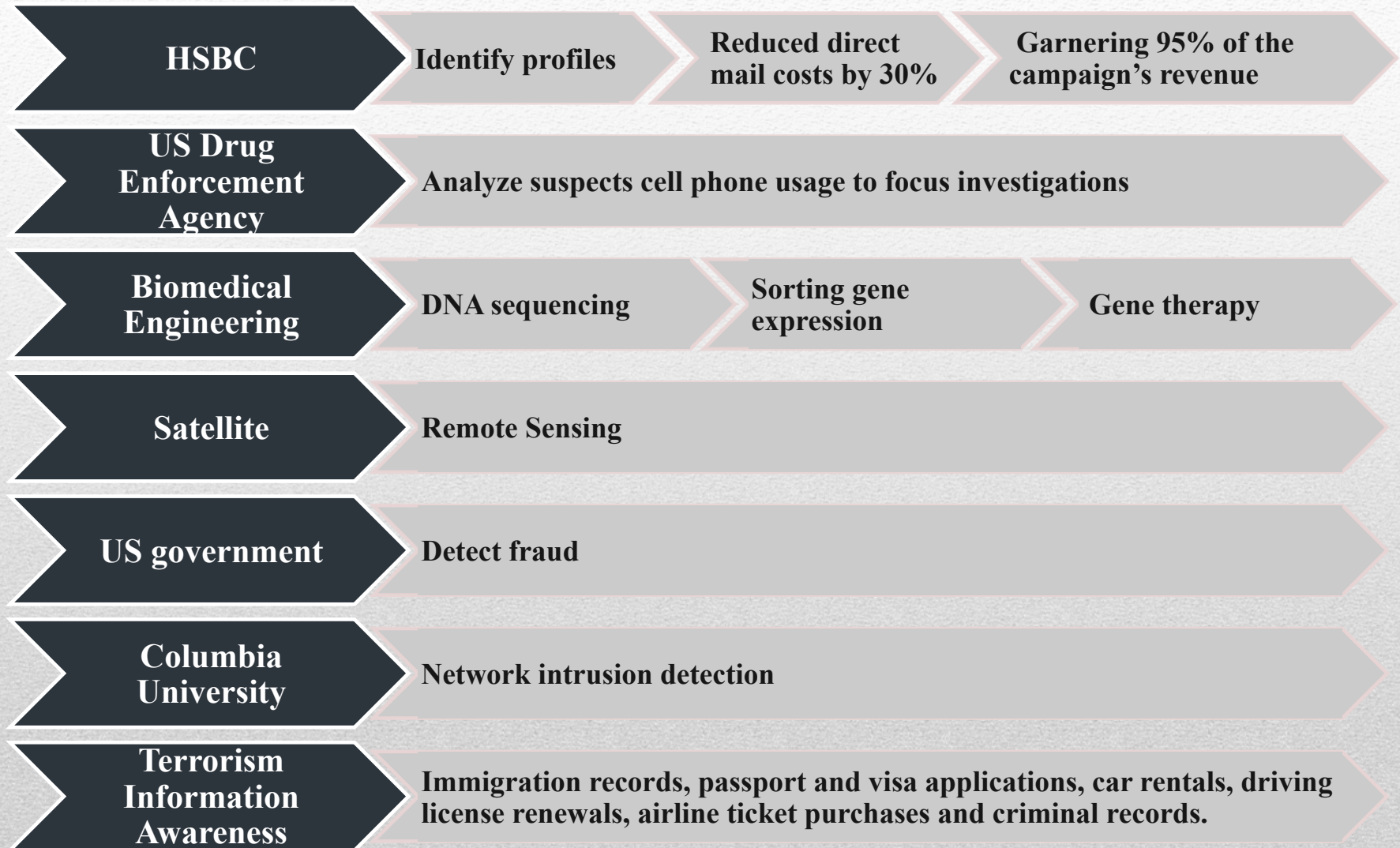
Researchers
- Collect & analyze data more efficiently.

Biological Firms
- Cure deadly diseases like AIDS, cancer and aids large projects (Human Genome Project).

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10

Success Stories of Data Mining Application

HSBC	Identify profiles	Reduced direct mail costs by 30%	Garnering 95% of the campaign's revenue
US Drug Enforcement Agency	Analyze suspects cell phone usage to focus investigations		
Biomedical Engineering	DNA sequencing	Sorting gene expression	Gene therapy
Satellite	Remote Sensing		
US government	Detect fraud		
Columbia University	Network intrusion detection		
Terrorism Information Awareness	Immigration records, passport and visa applications, car rentals, driving license renewals, airline ticket purchases and criminal records.		

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11

Steps in the Evolution of Data Mining

Evolutionary Step	Business Questions	Enabling Technologies	Product Providers	Characteristics
Data Collection (1960s)	What was my total revenue in the last 5 years?	Computers, tapes, disks	IBM	Retrospective, static data delivery
Data Access (1980s)	What were unit sales in New England last March?	RDBMS, SQL, ODBC	Oracle, Sybase, Informix, IBM, Microsoft	Retrospective, dynamic data delivery at record level
Data Warehouse (1990s)	What were unit sales in New England last March? Drill down to Boston.	OLAP, multidimensional DB, data warehouse	SPSS, Comshare, Arbor, Cognos, Microstrategy	Retrospective, dynamic data delivery at multiple levels
Data Mining (Emerging Today)	What's likely to happen to Boston unit sales next month? Why?	Advanced algorithms, multiprocessor computers, massive DB & knowledge bases	SPSS/Clementine, Lockheed, IBM, 5GL, SAS, Oracle, numerous startups	Retrospective, proactive information delivery

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12

Most Admired Knowledge Enterprises (MAKE)

Tata Steel has been recognized as the overall (1st place) 2006 Indian Most Admired Knowledge Enterprises (MAKE) Winner compared to its 6th position for the last year (2005).

There were 8 knowledge performance dimensions which are the basis of the MAKE award and Tata Steel performed as follows:

- Creating an enterprise knowledge-driven culture **(1st place)**
- Developing knowledge workers through senior management leadership **(2nd place)**
- Delivering knowledge-based products/solutions **(3rd place)**
- Maximizing enterprise intellectual capital **(3rd place)**
- Creating an environment for collaborative knowledge sharing **(1st place)**
- Creating a learning organization **(1st place)**
- Delivering value based on customer knowledge **(1st place)**
- Transforming organizational knowledge into shareholder value **(2nd place).**

Thank You

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