

# Bachelor of Engineering in Information Technology

ITM301 Professional Practices in IT

## Unit VII: Automation and effects of digitalization



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## Overview

- Productivity and jobs
- Work environment
- Globalization
- Society
- Environmental

## Impact on Productivity

Mostly positive impacts:

- *Automation*
  - A human pharmacist fills <20 prescriptions per hour; an online pharmacy uses robots to dispense 8,000 prescriptions per hour
- *Streamlining*
  - Middle layers in some organizations become unnecessary (e.g., creating and processing purchase orders)

## Productivity (cont.)

Productivity in the U.S. doubled between 1948 and 1990.

*Implications:*

- We could have maintained our 1948 standard of living and gone to a four-hour work day!

*...but, instead:*

- People in 1990 worked harder than those in 1948 – They owned and consumed twice as much as in 1948.

## Impacts on Jobs

### *Job Elimination –*

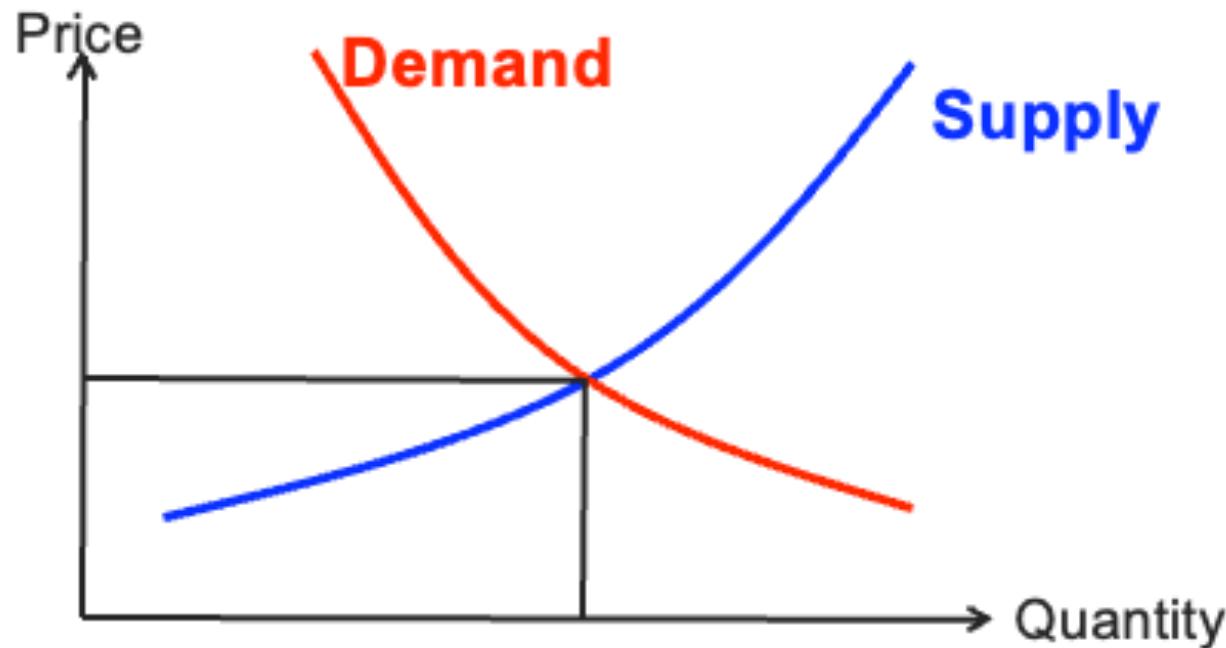
- Automation reduces or eliminates demands in certain job categories:
  - Telephone operators
  - Utility meter readers
  - Records processing staff
  - Secretaries and clerks

## Jobs (Cont..)

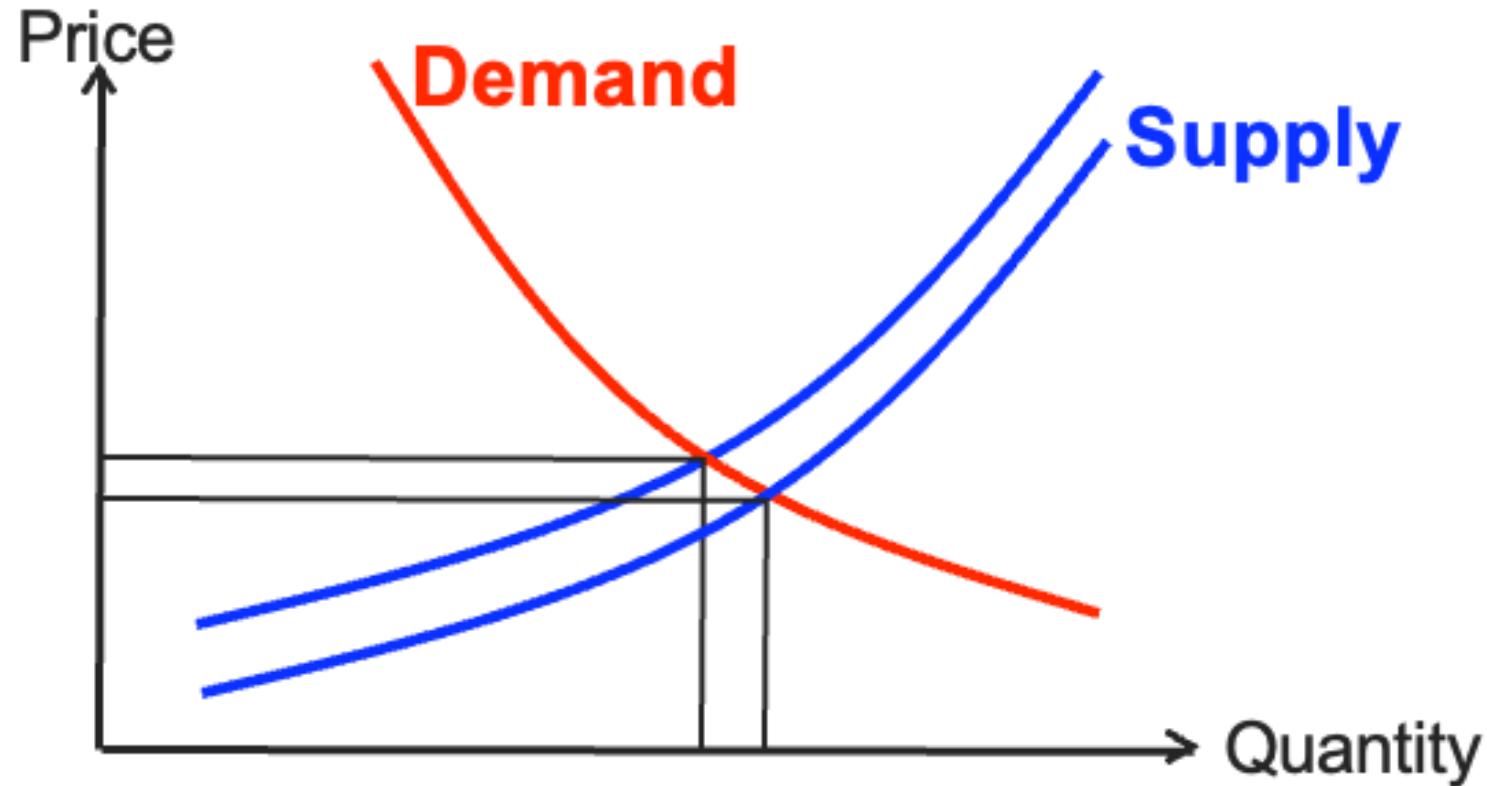
### *Job Creation –*

- New products and new industries create new jobs:
  - DVDs, iPods, ...
  - Cellphone industry
- Higher productivity lowers product prices; lower prices increase demand, which in turn create more jobs

## Supply and Demand



## Supply and Demand



## Jobs (cont..)

*What is the overall impact?*

- “The empirical evidence suggests overall that computers have not replaced workers or destroyed jobs; if anything, they have created jobs” [Larry Hirschhorn]
- “There will be plenty of jobs in the future, and most of them will be high-paying jobs” [Martin Carnoy]

## Impact on Work Environment

- Business organizational changes
- Telecommuting
- Temporary work
- Employee monitoring

## Organizational Change

- Increase in smaller businesses and independent consultants
  - Information entrepreneurs
  - “Mom and pop” shops on the Web
- IT integration into firms
  - Automating back-office functions (e.g., payroll)
  - Improving communication among business units
- *Results:*
  - Flattened organizational structures
  - Eliminating transactional middlemen

## Telecommuting

- Work away from traditional place of work:
  - Home office
  - Customer sites
  - Mobile office (e.g. salesmen)
- About 20% of Americans do some telecommuting

## Telecommuting (Cont..)

### *Benefits:*

- Reduces overhead for employers
- Reduces need for large offices
- Employees are more productive and satisfied
- Reduces traffic congestion, pollution, and stress
- Reduces expenses for commuting and work clothes
- Allows work to continue after blizzards, hurricanes, etc.

## Telecommuting (cont..)

### *Problems:*

- Threatens managers' control and authority
- Makes face-to-face meetings (e.g. with clients) impossible
- Team meetings more difficult (e.g. different schedules)
- Sensitive information less secure
- Tele-workers less visible, and “out of the loop”
- Tele-workers work longer hours for same pay

## Temporary Work

- Companies less committed to employees
- Lay-offs not taboo as they once were
- Companies hiring more temporary employees
  - Saves money on benefits
  - Makes it easier to downsize
- Long-term employment for one firm less common

## Employment Monitoring

- 82% of companies monitor employees in some way.
- *Main purpose:*
  - Identify inappropriate use of company resources
- *Other uses:*
  - Detect illegal activities
  - Gauge and improve productivity
  - Improve security

## Employee Crimes

- *Embezzlement* – fraudulent appropriation of company property
  - Trusted employees have stolen millions of dollars
- *Logic bomb* – software that destroys critical files (payroll and inventory records) after employee leaves
  - Angry fired employees sabotage company systems

## Monitoring Approaches

- *Old “Blue-Collar” Approaches:*
  - Time-clocks and logs
  - Output counts at the end of the day
  - Bosses patrolled the aisles watching workers
  - Camera surveillance in workplace
- *Location Monitoring:*
  - Electronic badge tracking
  - GPS tracking (e.g. in hospitals, long-haul trucks)

## Monitoring Approaches (cont..)

- *E-Mail, Voice Mail, and Web-Use Monitoring:*
  - Roughly half of major companies in the U.S. monitor or search employee e-mail, voice mail, or computer files
  - Some companies block specific web sites
  - Many employers have privacy policies regarding e- mail and voice mail

## Law and Court Cases

- Electronic Communications Privacy Act (ECPA) prohibits interception of e-mail and reading stored e-mail without a court order, but makes an exception for business systems
- Courts put heavy weight on the fact that computers, mail, and phone systems are owned by the employer who provides them for business purposes
- However, courts have ruled against monitoring done to snoop on personal and union activities or to track down whistleblowers
- The National Labor Relation Board (NLRB) sets rules and decides cases about worker-employer relations

## Globalization

- Refer to the process of creating a worldwide network of businesses and markets.
- *Reduce Trade Barriers:*
  - WTO and NAFTA
- *Global Workforce:*
  - Outsourcing
  - Offshoring
  - Foreign IT workers
  - Working for foreign companies (Insourcing?)

## Globalization (cont..)

- *Arguments For:*
  - Increases competition; produces better products
  - Increases everyone's standard of living
  - Global jobs reduce unrest and increase stability
- *Arguments Against:*
  - Forces workers to compete with foreigners who do not get decent wages and benefits
  - Accelerates exporting of manufacturing and white- collar jobs
  - Hurts workers in foreign countries

## Impact on Society

- The Digital Divide – Some people have access to modern IT while others do not.
- *Global digital divide:*
  - Access higher in wealthy countries
  - Access higher where IT infrastructure good
  - Access higher in English-speaking countries
- *Social digital divide:*
  - Access higher for young people
  - Access higher for well-educated people
  - Access higher for urban areas

## Critiques of the Digital Divide

- DD talk suggests the difference between “haves” and “have nots” is simply about access; It implies lack of access leads to less advantaged social position
- *Counter:*
  - Social and culture change are more important
  - Internet is not the pinnacle of IT
  - DD talk puts everyone in two categories, but reality is a continuum

## Environmental Impacts

- Resource Consumption
  - Power and materials
  - Both in production and in operation
- E-Waste

*EPA Statistics (2006-2007):*

	Generated (mil of units)	Disposed (mil of units)	Recycled (mil of units)	Recycle Rate (by weight)
Televisions	26.9	20.6	6.3	18%
Computers	205.5	157.3	48.2	18%
Cell Phones	140.3	126.3	14.0	10%

## Green(er) Computer?

The XO by One Laptop per Child (OLPC):



Claims to be the most eco-green laptop.

## Discussion Questions

- What jobs that were once considered high-skill jobs are now low-skill due to technology?
- Would you want to telecommute?      Why or why not?
- How much privacy is reasonable for an employee to expect in the workplace?
- Under what circumstances is it appropriate for an employer to read an employee's e-mail?

# Thank you