SIV851:
Special Module on
e-Governance
(1-credit)

Subhash Bhalla (Mar-Apr 2024)

Department of Computer Science and Engineering, Indian Institute of Technology, Delhi

Outline

- Today's discussion:
  What constitutes the term e-governance

- Background
- Case Studies
- History - Cases of e-governance in India
- Problems of e-governance & best practices
- e-governance Infrastructure and scalability
- Conclusions

Course Outline

- What is E-Governance
  - Electronic Governance
  - Enabling Governance

Computing Systems and Changes – Cycle

Classes → Class Assignments (readings)(10 points)
→ Quizes (2) 30 points
→ Exercises (XML, Web Services)(10 points)

Governance – Public Administration

- Term Government → Governance
- Support normal activities that concern people (not business) + maintain records (200+ year archives)
- Concerns laws, public welfare, constitution, enforcement of Judicial, legal and executive authority
- Change management over time with elements of evolution for the betterment
- Plan for growth, civics, …,civil and criminal

Beginning of Computing View of Governance

- 1960-70s Computers were very large
- Problems → Predict weather ? Rain/storm

  - Before sowing deeds / before harvest

  - To predict weather after 1 week –

  - The time to compute took 2 weeks
    (Need for large Capacity of data
    and faster computing)

Beginning of Computing View of Governance

- Computing → Mostly for Governance
- Census data
- Military
- Weather prediction

- Computers were costly , bulky , low on capacity, doing Scientific Computing

- Called → Main Frames, later Super Computers

- In 1960s Thomas Watson (IBM Founder's Comment → world needs 8-10 computers

Recent View of Computing and Governance

Problems cover all fields
(Number and size: too many and too large)

- (not just scientific computing)
- Mid-80s (Internet) → PCs, Workstations
- After 1990-93 (Web)
- Google Search (1990s)
- Maps (2000s)
- Cloud Computing → Smartphones (2010s)
- CHATgpt and AI (2020s)

Recent View of Changes in Computing and Governance

- University Faculty attend Conference
- Information – by broadcast on DBWORLD mail server (1993 – 1999)
- Information by Web page 1995 –
- Webservices → location on Maps and calender dates (Choose area and time) 2005
- In agriculture, Healthcare, Transportation → more and more real-time approaches are needed.

Governance

- 100s of activities as tasks and subtasks
- + Aadhar
- +PAN card
- +Election cards
- +employment in rural area

- Large scale

- Concern population

- Manual procedures
- Simple adoption of IT and
- computerization

- Tasks → unmanageable without IT or e-governance

Recent News

- Vivo secretly sent out Rs 62,476 crore to China to avoid taxes in India

- Read more at: https://www.deccanherald.com/national/vivo-remitted-rs-62476-crore-to-china-to-avoid-getting-taxed-in-india-says-ed-1124632.html

- DRI accuses Oppo India of Rs 4,400 crore tax and duty evasion

- Read more at:
- http://timesofindia.indiatimes.com/articleshow/92861539.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

- No Governance ? Omissions OR Commisions ?

- Evolutionary process – too little and too late

E-governance in other countries

- In China, Japan, USA, .. → It is not possible to avoid tax

- In China, a company required to use transactional software approved by Govt. of China
- → A copy of each business transaction is sent to China Govt. servers for record and audit in real-time

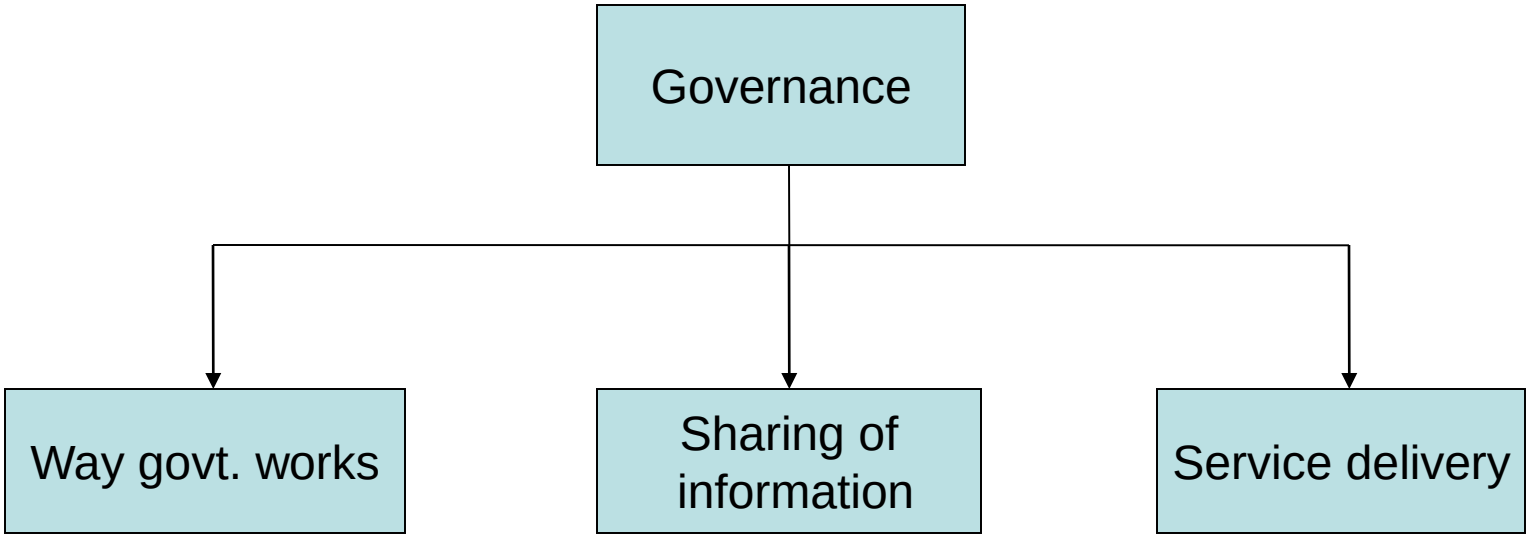
- YAHOO Japan news in July 2022 (after vivo and oppo): In India, most cases, authority notice has legal flaws (governance is weak, e-governance ?

- Hence (courts, lawyers, reply quoting a rule, etc…)

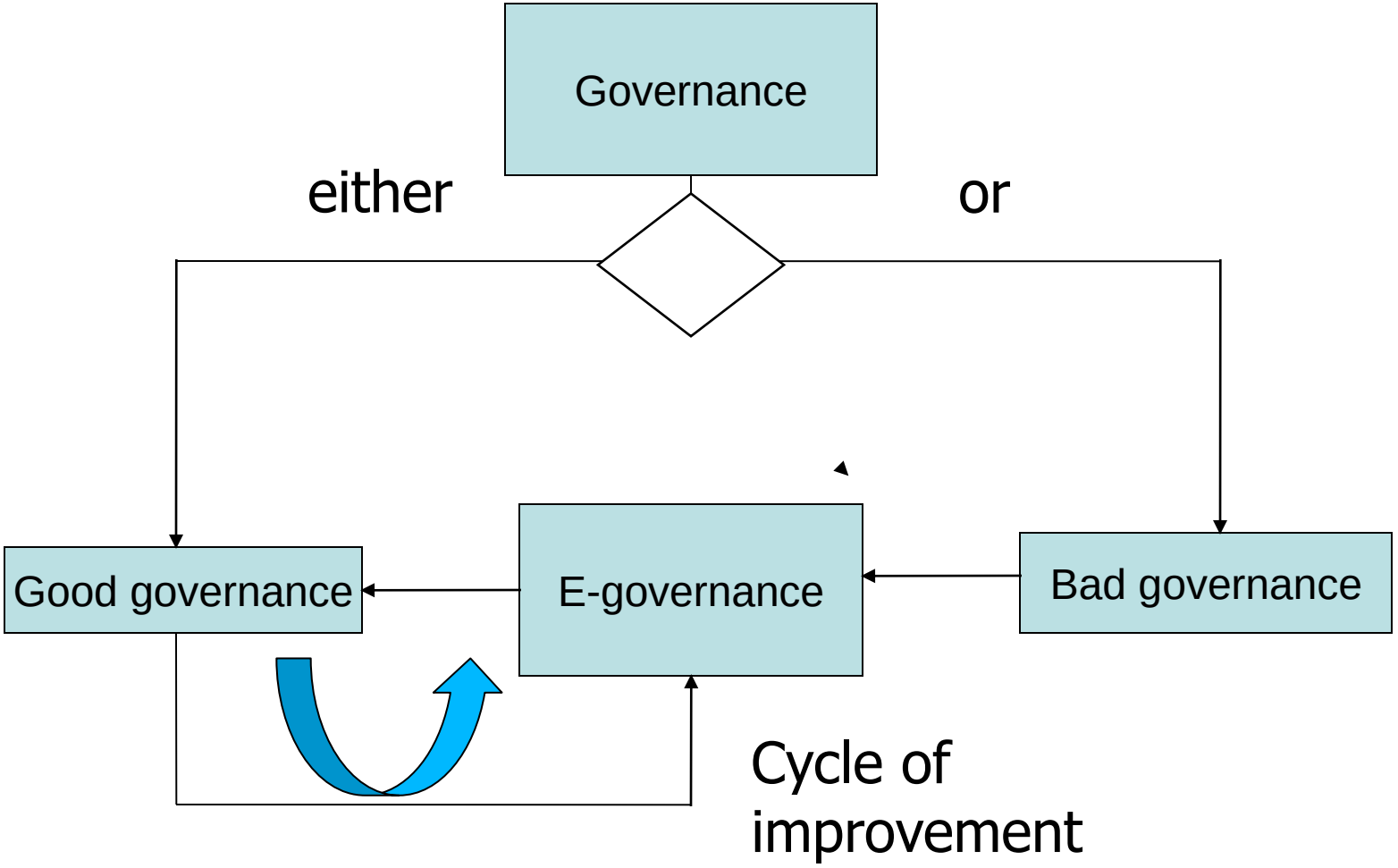
- Bank frauds → Chowksi, Nirav Modi, ..ICICI Bank

- ED and CBI cases " conviction rates are poor"
- Governance →e-governance (records and monitoring) is missing ?

Background:
Role of Governance?
Public adminsitration



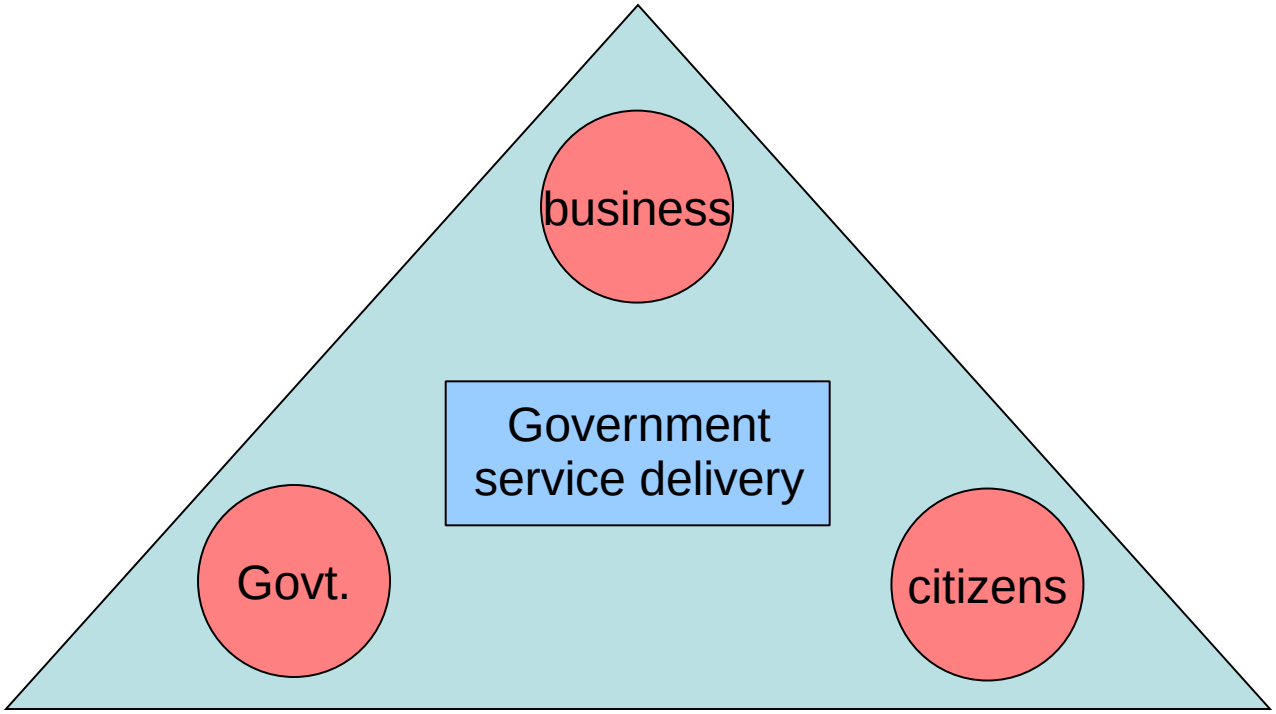
Background: Role of e-governance



Definition: What is included in E-Governance

- Information and Communication Technology (ICT)
- Efficiency
- Productivity
- Reach
- Sharing of information
- Service delivery to masses
- Welfare of people

Agencies in E-Governance



Evolution of E-Governance

- Terms in use: IT in Governance
- Data Governance
- Electronic Governance

- [1. Step-wise adoption of IT in processes
- (adoption of e-forms, paperless offices)
- Example- Computerization of manual processes

- 2. web-based Database systems
- (Reach and records), e.g. Banking

- 3. Large scale Governance in Public Administration (Change,..Technology Disruptions)

Enabling Governance (e-Governance) at large scale

- state-of-the-art technology
- (Cloud-based Databases, Service-oriented Architecture, Distributed Systems)

- Examples
- e-Agriculture for public welfare,
- e-Healthcare for public, (saves cost of medical care)
- e-money [part of Digital India plan]
- ;;:; . . . . .

- E as in Enabling (Enabling Governance)

Focus of our study

Case Example: e-Agriculture

- IIIT Hyderabad → eSagu project
- Sagu means Cultivation (local farmers in AP)
- Project Funded by Ministry of IT (Govt. of India)
- Readings:

1. eSagu™: a data warehouse enabled personalized agricultural advisory system,
SIGMOD '07: Proceedings of the 2007 ACM SIGMOD international conference on Management of data, June 2007, pp. 910-914.

2. Search "eSagu" on google or chatGPT

Case Example: e-Agriculture

- Motivation:
- High incidence of farmer suicides in 2002-3

- 1. farmer took loans for digging a well, after digging no water.

- 2. Excessive pesticides in soil

REALIZATION:
farms need agriculture consultation.

eSagu: personalized agricultural advisory system

- Motivation→1.Use IT Technology for Governance
- 2. Enabling support

- 1. Problem: Limits in reach of wired Telephony
- (with time, a solution→ Mobile Phones)

- 2. Problem: Limits in reach of mobile telecom
(soon with time → Satelite Communication and 5G Tech)
All village punchayats will be linked to internet

- 3. Problem: Limits in availability of Computers
- (nowadays → cloud-based databases),
AWS and Google Workspace
cost – Rs 500/- pm for small businesses

Personalized agricultural advisory system

- Help for Indian farmers→ data mining and ware housing

- Based on Space and Time data warehousing
- (example- Plague spread in Germany, a doctor made a map of deaths in city → many cases located near a well that had contaminated water)
- (example- Healthcare system in Germany, Japan, etc., .. Time and location maps of spread of various diseases for warnings and healthcare)

Data warehousing for agriculture (e-governance)

- Data Warehouse of farm related information (gathers details with reference to location and time)
- Farm histories help experts to deliver agriculture advice
- Provide a Clinic to approach to individual farm and farmer
- Agriculture expert does not visit
- Delivers expert advice once a week/fortnight to each farm
- Inputs ← Digital photos and other inputs
- During 2004-06, coverage 600 farms in 1/3 of Andhra Pradesh

Personalized agricultural advisory system

- Goals:
- Farmers: 1. save cost on capital investment
- 2. Improve Crops yields

- Mass customization →

- requires

Personalized information services

Personalized agricultural advisory system

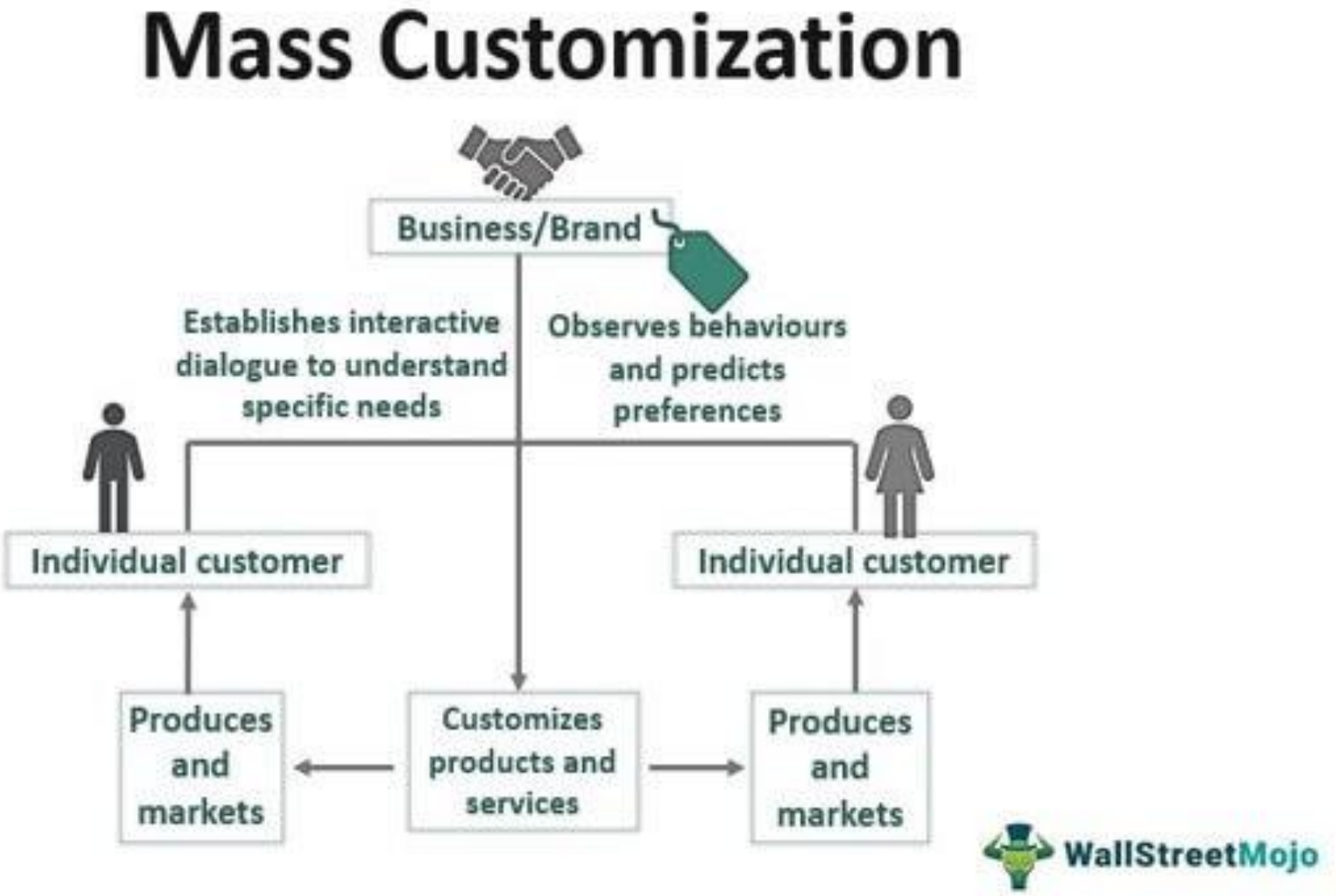
Mass customization

- → a business process
- → provides customized goods and services to meet individual's needs.

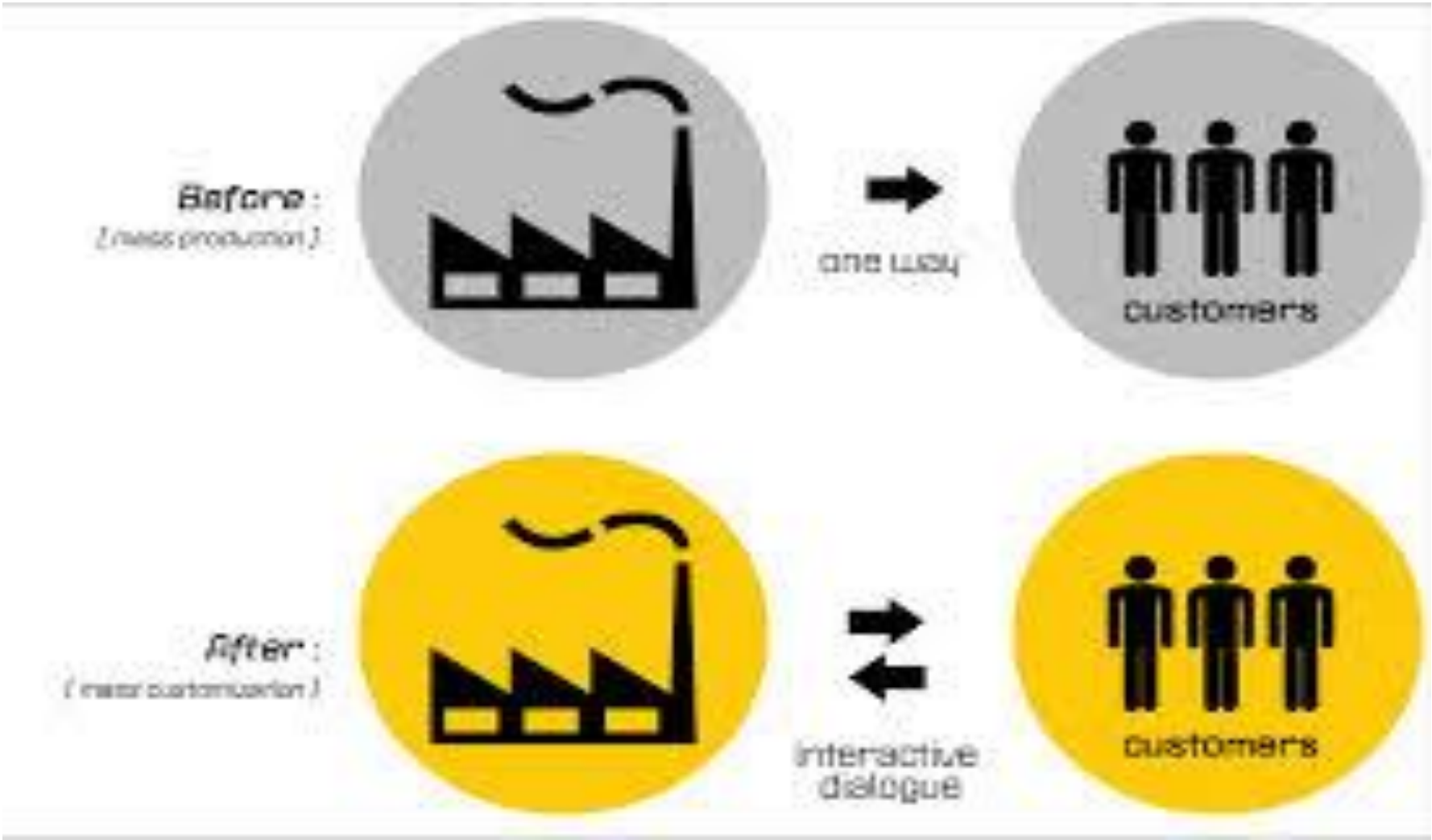
- Benefits: flexibility, integration, and personalization

- Produces: custom-made products,
- low unit costs,
- with mass production efficiency

Personalized agricultural advisory system



Personalized agricultural advisory system



After→ agricultural advisory system

- Technology:
- 1. Database and Data ware-housing

- 2. Data Mining

- Mobile communication and internet
- For
- Judicious use of farm inputs
- Cost minimization
- Sustainability
- Increase agriculture output

→Expert Advice must be delivered

→Advanced Agricultural Technology

Before mass customization
Traditioanal Agriculture

- Use of magazines, Newspapers
- Broadcast media, TV talks and programs, Radio, you tube, blogs
- Organizing seminars and meetings
- Web sites
- FAILURES: lack of coverage, accountability; no timeliness, not personalized
- No advice to indidual
- No feedback, problem solving

eSagu- Personalized agricultural advisory system

- IT + Agriculture Science

- 1. Provides advice in time
- 2. Personalized

- Farmer does not ask questions
  -sends crop situation in photo and details

- Receives advice generated by agriculture scientists

Personalized agricultural advice delivery system

- Stages → from sowing to harvesting
- Regular→ agricultural advice delivered every 1 - 2 weeks to farms
- Scalable
- Query-less
- Personalized expert advice

Personalized agricultural advice delivery system

- Ministry of IT funded research project
- Years 2004-06
- 600 farms on 6 different crops
- Area approx. 1 / 3 rd of A.P.
- 14 experts on Plants, Botany, Entymology,…plant diseases…pesticides, insects,…. [siting in a Hall]
- → On Average 50 cases per scientist per day (total 700 pieces of daily advice to farmers)

Personalized agricultural advice delivery system

- Digital images of insect eaten leaves →
- enlarged on screen:
  no microscopes needed

FARMERS:
Increase in yields
Cost savings
Individual advice is a piece of text: corrective steps
Sending crop information and photos
All digital messages over internet/ postal CDs

Traditional Information Access and Service Delivery models of e-governance

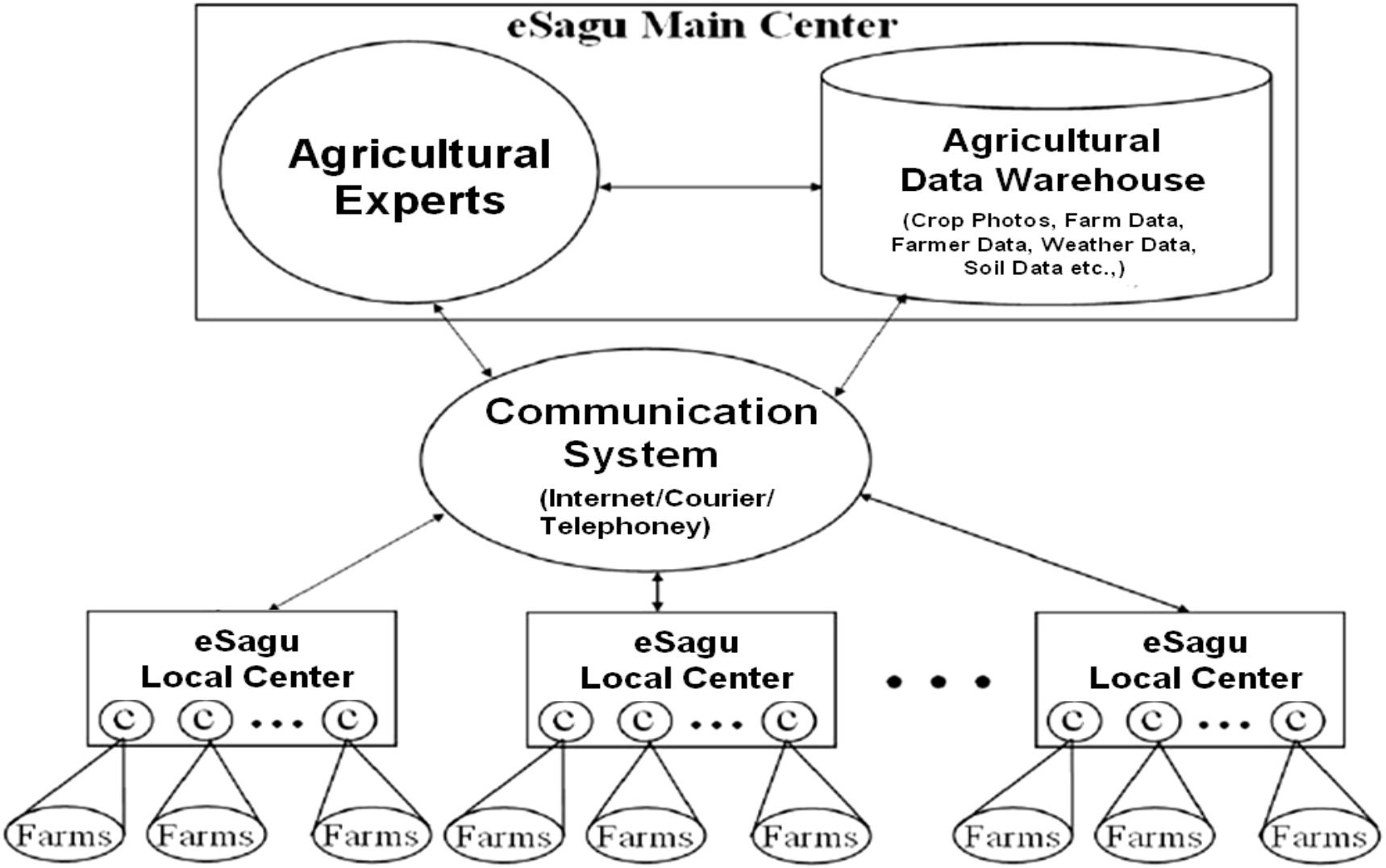
- Broadcasting Model: TV talks, Radio
- Critical Flow Model: Agriculture University
- Comparative Analysis Model: weekly meet
- Interactive Service Model: Scientists/experts

Traditional Information Access and Service Delivery models of e-governance

- Agri experts should visit the farms for high quality advice
- Visit → most time spent in travel
- Setup → Laboratory and microscopes
- Specializations → too diverse : Plants diseases, insects, pesticides, ….
- Literacy → often illiterate farmers
- IMPOSSIBLE: build, scale, operate , ..

Personalized agricultural advice delivery system

[Architecture: C Coordinator; ← → flow of information]
Coordinator is a selected educated local farmer



[Architecture: C Coordinator; ← → flow of information]

- (i) Farmer → Own farms, may be illiterate
- (ii) Local center → For every 10-20 vilages, a computer, a dialup internet connection, an operator
- (iii) Coordinators → skilled in reading/writing in local language and in agriculture
- (iv) Main center → Team of agriculture experts interact with information system to generate scientific advice
- (v) Agriculture experts → persons with University degrees
- (vi) Data warehouse → all related information; crop observation photographs, text, crop pest resistance, water requirement, farmer registration data, weather information

Personalized agricultural advice delivery system

[Operation]

- Few farms assigned to each coordinator
- Every day visit few farms, collect data about soil, water,
- gather 5-6 photographs of problem in plants, fills in feedback, check impact of previous advice, see pest control
- Photographs are collected regularly, irrespective of any problem

Personalized agricultural advice delivery system

- Year 2004-05: 1051 cotton farms

- Year 2005-06: 5000 farms
- Cotton, Chilies, Rice, Groundnut, Castor, Redgram crops

- Demonstration of Success
  - turn around time 24-36 hours
  - farmers avoided indiscriminate use of fertilizers and pesticides
  - higher yield per unit area
  - lower costs

Personalized agricultural advice delivery system

- Zooming facility:

creates a microscopic effect. Minute insect eggs can be seen to identify a problem

+ Coverage of more number of farms by experts

+ Global reach → can use pay services offering 50000 image pool of diseased plant leaf pictures

Other cases: How successful has e-governance been in India?

State	Project	Ease of Use	Simplicity of procedure	Time Savings compared to manual	Affordable cost of service	Reduction in Corruption	Total
Assam	Rajiv Gandhi Computer Literacy Program	10	10	10	10	10	8.9
WB	Land Records – Hoogli	9	7	9	10	9	7.6
WB	Tele-Medicine Midnapore	10	9	10	10	10	8.8
WB	Gram Panchayat Kanaipur	10	7	9	9	9	8.6
WB	Computer Literacy and Training Program	8	10	10	5	10	8
Sikkim	CIC – Temi	10	9	10	8	10	8.9
Sikkim	Land Records – Namchi	10	8	10	10	10	8.1
AP	Rural e-seva – West Godavari	10	8	10	10	9	8.9
Delhi	Transport – IP Estate	10	8	10	10	8	8.1
HP	Property Registration – Simla rural	9	9	9	10	8	8.2
HP	Land Records – Suni	9	8	9	5	9	7.6
Punjab	Suvidha – Kapurthala	10	8	10	9	9	8.9
Punjab	Property Registration – Sang	9	8	9	10	4	7.4
Punjab	Transport – Ropar	10	9	9	10	7	7.7
Center	IT in Judiciary – NIC	10	9	10	10	9	8.9
Center	Customs – NIC	8	8	9	10	6	7.6
	Average	9.5	8.4	9.6	9.1	8.6	8.3

e-governance Best Practices

- Increased accountability
- Increased transparency

- Higher availability of public domain information
- Reduced corruption

- Higher penetration due to automation
- Increased efficiency due to connectivity

- PROCESS RE-ENGINEERING – technology only a tool not panacea

E-governance Scalability

- Most projects till now have been pilot projects
- A few things to note
  - Sustainability
  - Evaluation and impact assessment
  - Accountability
  - Training for civil servants
  - Private partnership
- Pilot, Plan, Replicate, Revise and Scale

Conclusions

- 35% of e-governance projects in developing regions are complete failure;
- 50% are partial failures;
- only 15% are successful

- If the successful projects can be scaled → good achievement

References

1. Skoch e-governance report card: http://skoch.in/new/e-Governance_Report_Card2005.pdf
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3. Impact assessment study of e-government projects: Findings from eight Indian projects – Subhash Bhatnagar
4. E-government: Lessons from implementation in developing countries – Subhash Bhatnagar, Regional Development Dialogue, Vol 24, UNCRD, Autumn 2002
5. SUWIDHA portal: http://suwidha.nic.in
6. Suwidha project details: www.doitpunjab.gov.in/pdfs/projects/suwidha.pdf
7. CIC portal: http://www.cic.nic.in/welcome.html
8. CIC project details: http://beep.jepponet.dk/egovIndia/ShowCase.asp?CaseID=1492

References (contd.)

- Main Reading:

9. eSagu™: a data warehouse enabled personalized agricultural advisory system,
SIGMOD '07: Proceedings of the 2007 ACM SIGMOD international conference on Management of data, June 2007, pp. 910-914.

Summary and Conclusions

- What is enabling governance (e-gov)
  → Seeking to increase interoperability

  - among technical and social sciences

  - Towards new forms of governance associated with digital technology

- E-governance is a CONCEPT WITH MANY MEANINGS

Class ASSIGNMENT 1 (17 March)

- Reference- Viewpoint off futures of digital governance, CACM, March 2022, Vol. 85, No. 3, pp. 30-32
- Please answer→ What is e-governce
- Prepare a 3 page report ,
- OR make 12-15 slides
- Key requirement: (complete and correct)