香港浸會大學
HONG KONG BAPTIST UNIVERSITY

SECURITY, PRIVACY AND TRUST FOR ADVANCED INFORMATION SYSTEMS AND E-BUSINESS APPLICATIONS

PI : **Dr XIAO Sophia B**, Assistant Professor, Department of Computer Science

Dr HU Haibo, Research Assistant Professor, Department of Computer Science

OBJECTIVES

✦ To study the security and privacy challenges in modern databases and information systems, especially in the emerging infrastructures of mobile and cloud computing

✦ To examine the cognitive, affective, and social issues related to the effective and efficient use and management of e-business systems

HIGHLIGHTS

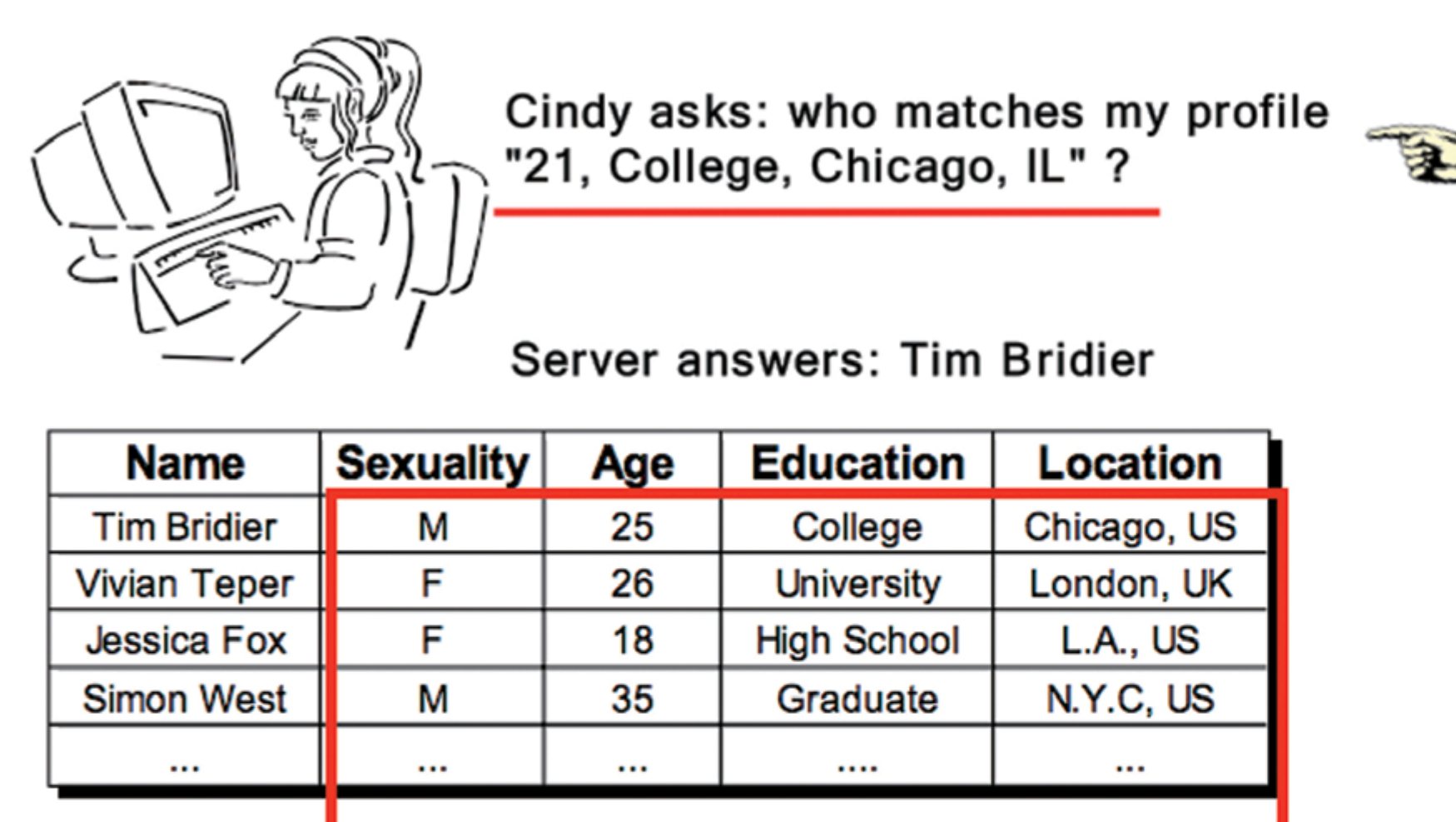### PRIVACY-PRESERVING LOCATION PUBLISHING AND MONITORING FOR MOBILE CLIENTS

✦ Sensitive location (e.g., hospital) discloses private information.

✦ Location should be anonymized before being published.

✦ Research findings are published in 4 papers in ACM TODS, IEEE TKDE, IEEE TPDS, ICDE 2009.


Mobile information systems
- Value-added services
- Location-based services
- Mobile social networking
- Digital broadcasting

● Mobile information systems require user locations.
● Location is sensitive user context to protect.
● Good solution trades little service quality for privacy.

Mobile Information Systems

QUERY PROCESSING WITH MUTUAL PRIVACY PROTECTION IN CLOUD COMPUTING SYSTEMS

✦ Protect both data privacy and query privacy in outsourced databases.

✦ Design both secure multiparty computation and privacy homomorphism-based techniques for efficient query processing.

✦ Research findings are published in IEEE ICDE 2011 and ongoing work in submission.

Cindy asks: who matches my profile "21, College, Chicago, IL" ?

Server answers: Tim Bridier

Name	Sexuality	Age	Education	Location
Tim Bridier	M	25	College	Chicago, US
Vivian Teper	F	26	University	London, UK
Jessica Fox	F	18	High School	L.A., US
Simon West	M	35	Graduate	N.Y.C, US
...	...	...	....	...

A query processing framework based on privacy homomorphism

Mutual privacy protection is important for outsourced databases.
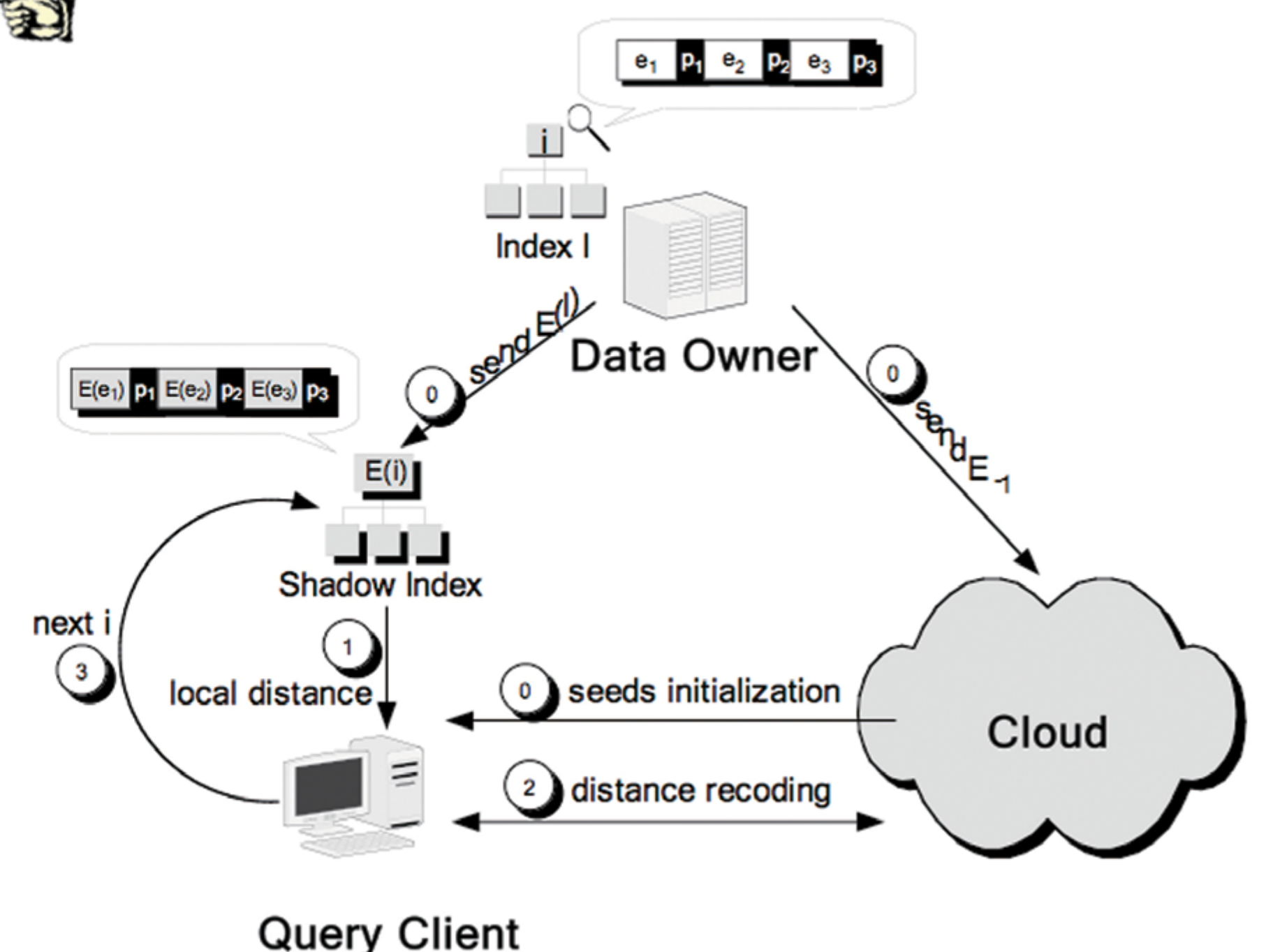
TRUST & RISK IN E-BUSINESS

✦ Theory and empirical studies on e-commerce deception, with special focus on deception via online product recommendation agents (PRAs)

✦ Theory on the use, design characteristics, and impact of online PRAs

✦ Theory and empirical study of the advancement of public trust relationships in e-government initiatives
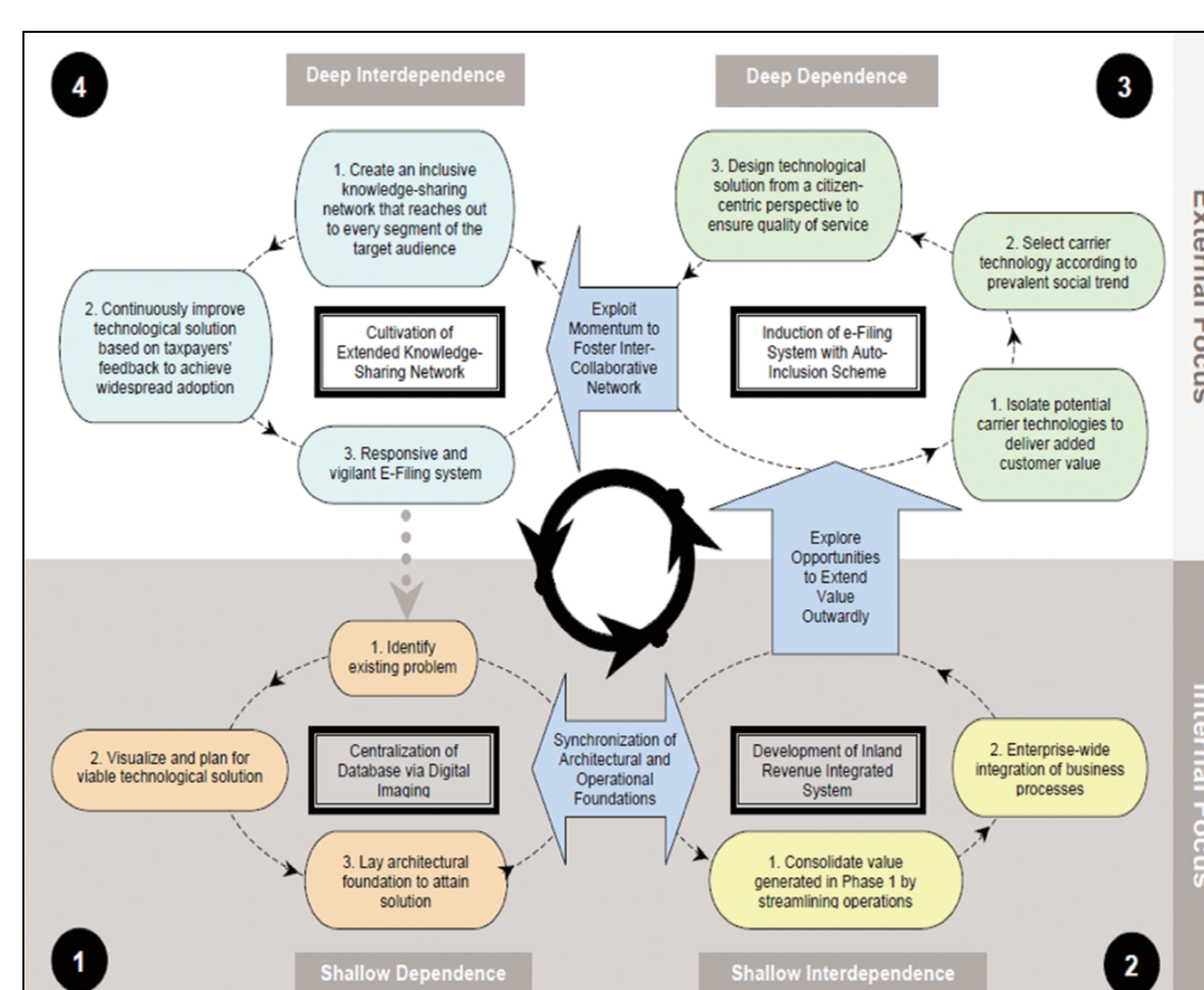
OUTCOMES

✦ Two papers published in Management Information Systems Quarterly, the recognized #1 journal in Information Systems (IS) discipline with the highest impact factor (4.49) and less than 7% acceptance rate

✦ A paper accepted for publication by Information Systems Research, the recognized #2 journal in IS discipline with high impact factor (2.261)

SELECTED PUBLICATIONS

1. Xiao, B. and Benbasat, I. Product-Related Deception in E-Commerce: A Theoretical Perspective. *Management Information Systems Quarterly*, (35:1), pp. 169-195, 2011.

2. Tan, C.W., Lim, E., Xiao, B. and Cyr, D. Advancing Public Trust Relationships in Electronic Government: The Singapore E-Filing Journey. Accepted by *Information Systems Research*, 2011.

3. H. Hu, J. Xu, C. Ren, B. Choi. "Processing Private Queries over Untrusted Data Cloud through Privacy Homomorphism." Proc. of the 27th IEEE International Conference on Data Engineering (ICDE '11).

4. H. Hu, J. Xu, S. T. On, J. Du, and K. Y. Ng. "Privacy-Aware Location Data Publishing". ACM Transactions on Database Systems (TODS), 35(3), 2010.

5. H. Hu and J. Xu. "2PASS: Bandwidth-Optimized Location Cloaking for Anonymous Location-Based Services." IEEE Transactions on Parallel and Distributed Systems (TPDS), 21(10): 1458-1472, October 2010.

6. H. Hu, J. Xu and D. L. Lee. "PAM: An Efficient and Privacy-Aware Monitoring Framework for Continuously Moving Objects." IEEE Transactions on Data and Knowledge Engineering (TKDE), 22(3): 404-419, March 2010.

7. H. Hu and J. Xu. "Non-Exposure Location Anonymity." Proc. of the 25th Int. Conf. on Data Engineering (ICDE '09), Shanghai, China, pp. 1120-1131.

8. Xiao, B. and Benbasat, I. E-Commerce Product Recommendation Agents: Use, Characteristics, and Impact. *Management Information Systems Quarterly* (31:1), pp. 137-209, 2007.