Cyber-Physical-Internet-Driven Logistics Infrastructure Integration in the Greater Bay Area

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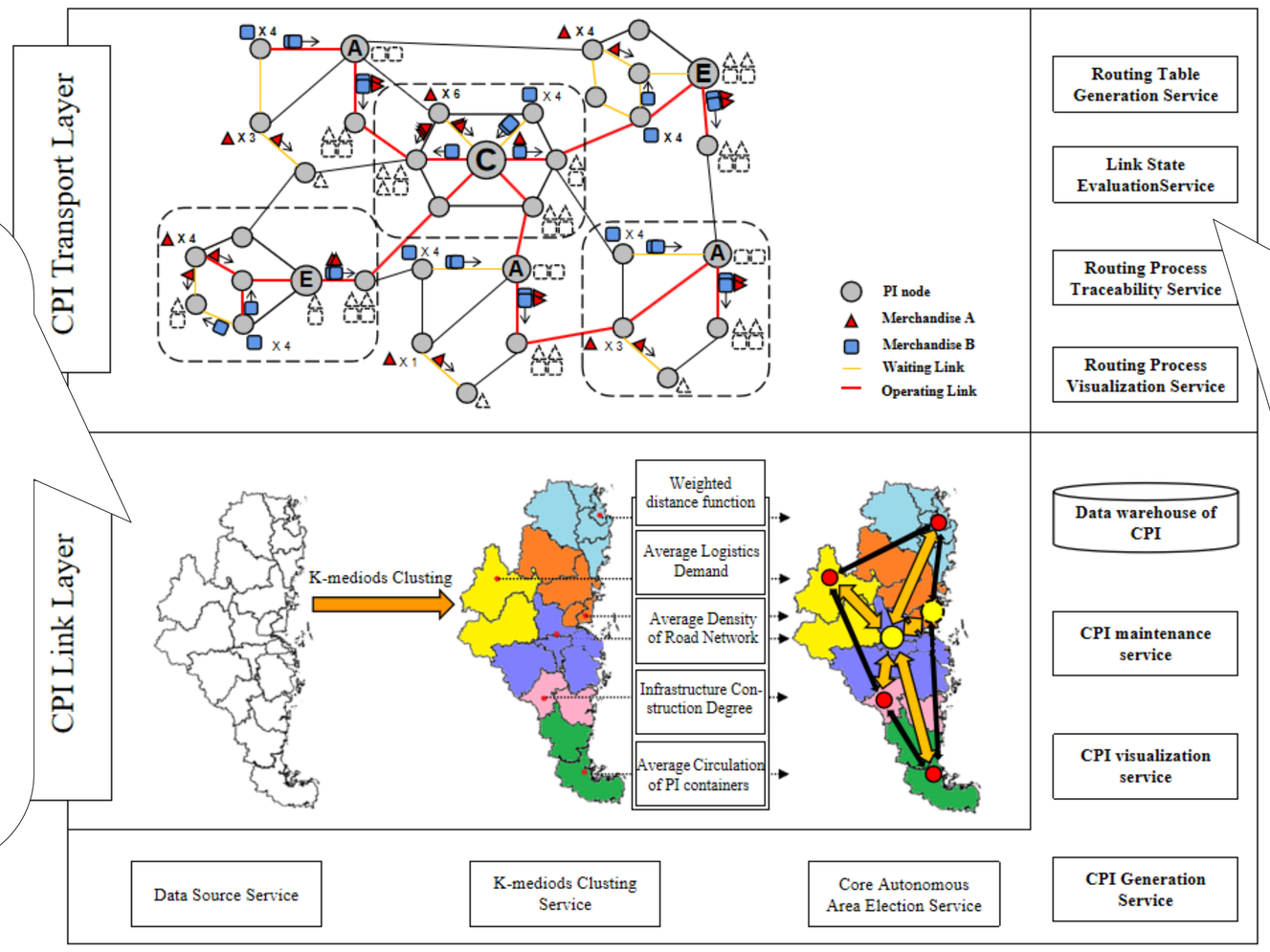
OBJECTIVE

- To establish a logistics infrastructure integration network based on the existing logistics infrastructure in the GBA;
- To migrate the general features of the computer network fusion to CPI and establish an infrastructure integration network with good real-time performance;
- To design an innovative path evaluation mechanism and specific routing mechanisms for CPI with motivation of data package routing in computer networks.

METHODOLOGY

This research proposes a framework with two-layer for the infrastructure integration network in GBA.

For the fusion of link layer, this research propose an approach to establish the connection between different areas to form an integrated CPI network to achieve the integrated and persistent management.



For the fusion of transport layer, this research has developed two routing mechanisms with different path evaluation mechanisms for the integrated CPI network.

Finally, a simulation experiment is conducted for integrating pharmaceutical logistics network in the GBA to verify the effectiveness and efficiency of the proposed framework from multiple dimensions. The result of the experiments demonstrates that the framework is effectively applied to the medical logistics network in the GBA with high-capacity utilization and more stable load balance.

CONTRIBUTION

1. The computer network concept is migrated in the proposed framework, which provide a new perspective for logistics infrastructure integration.
2. The proposed routing mechanisms of the framework can adapt to different network scales and has good scalability.
3. The experiment used a data-driven approach to verify the effectiveness of the proposed framework.