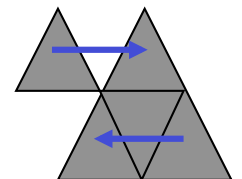


# Stepping Back is to Leap Forward

## Putback-based Approach to Bidirectional Programming

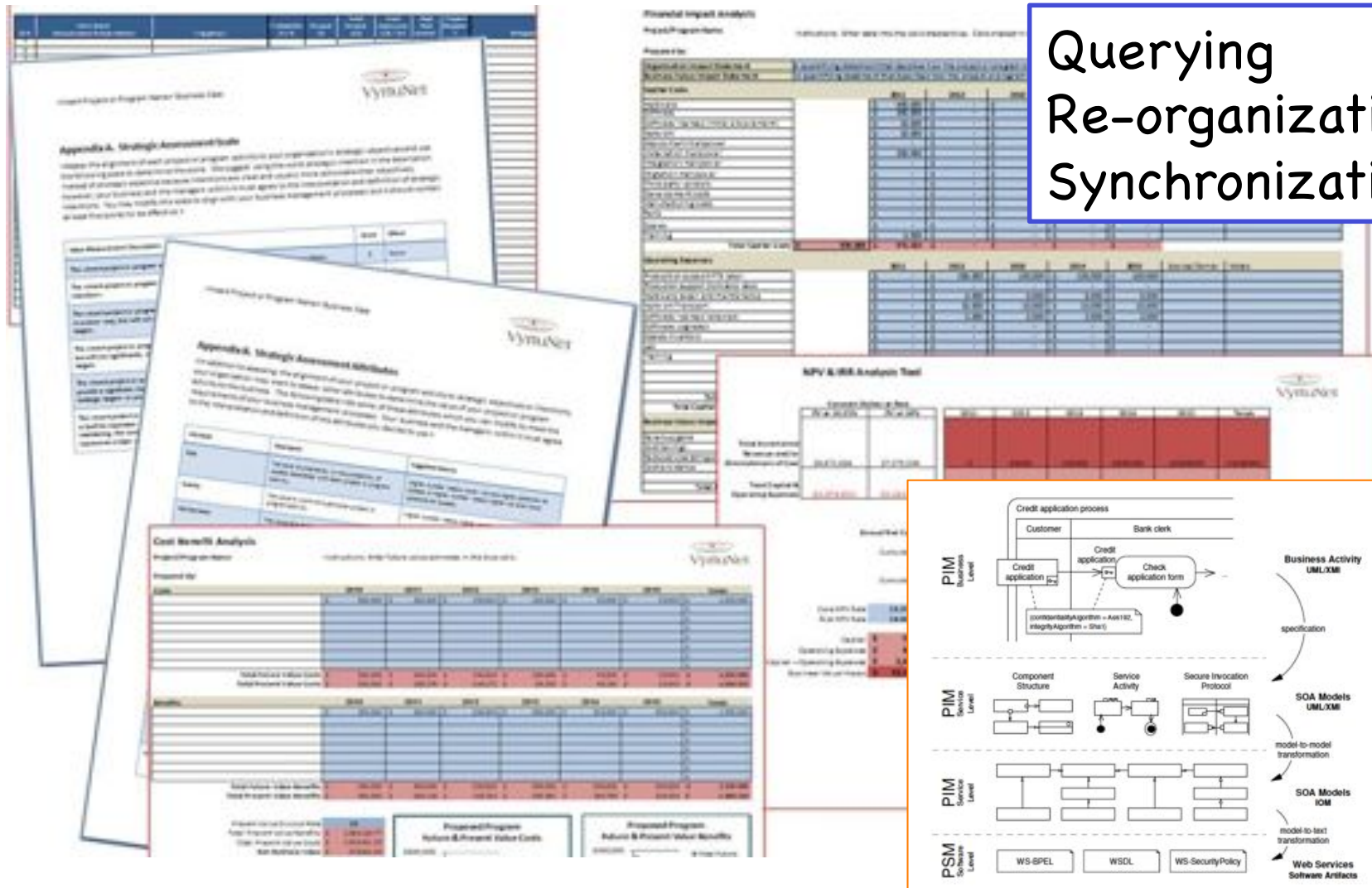
Zhenjiang Hu  
National Institute of Informatics (NII)  
December 21, 2013

Joint Work with  
BiG Team in Tokyo



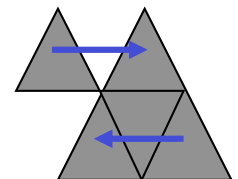
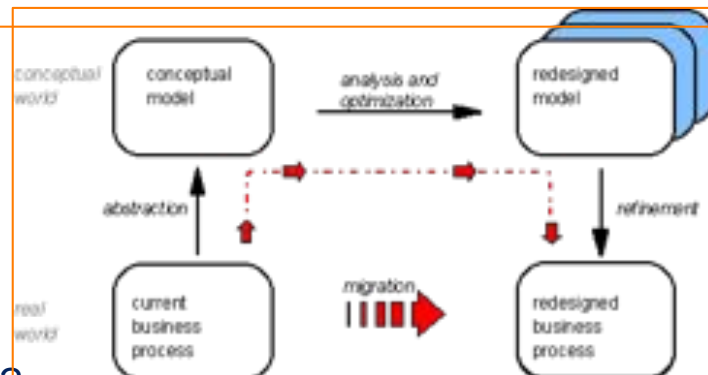
# Artifact Management in SE Development

Querying  
Re-organization  
Synchronization

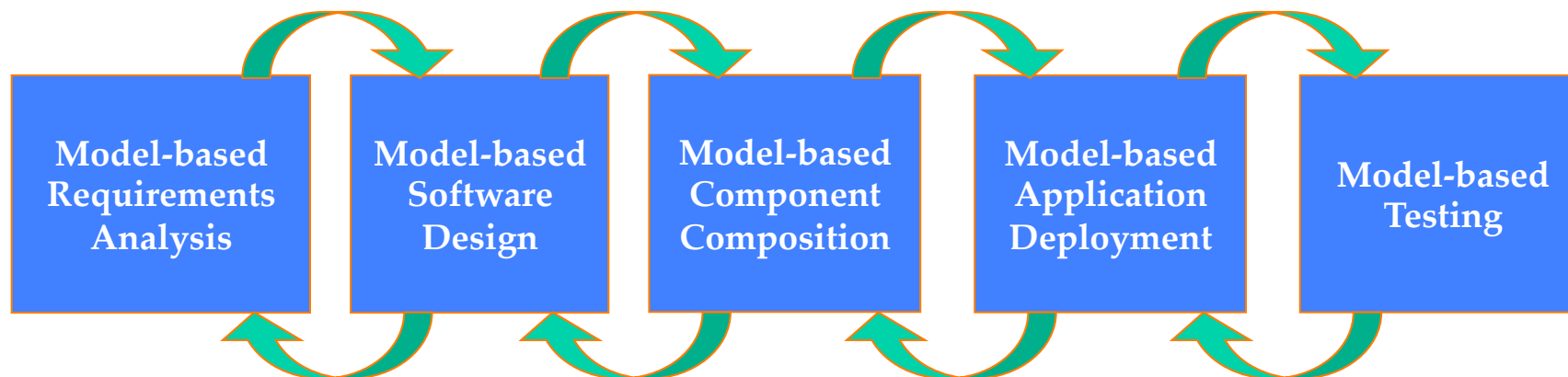
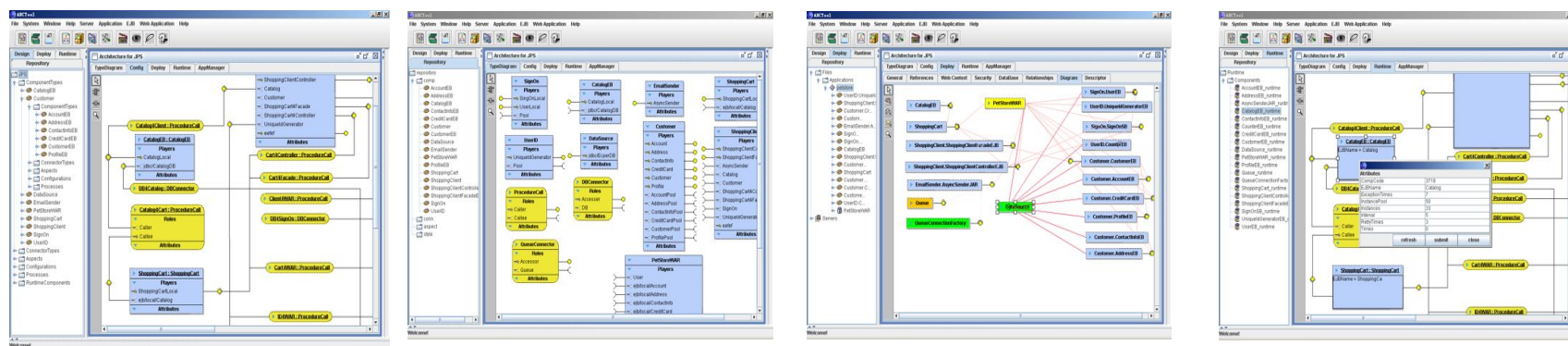


# Systems Interoperability

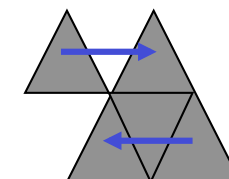
Collaboration  
Co-evolution  
Synchronization



# Bidirectional Model-Driven Software Development



BT in ABC: 2005-2008 海外杰青项目 (Hu + Mei)



# Challenges

How to efficiently manipulate various data?

- Querying data
- Generating/restructuring/virtualizing data
- Synchronizing/coevolving data



Data could be **lists**. **Trees**, or **graphs**, could be **composed** from different sources, and could be dynamically **updated**

## Bidirectional Transformation!

