The Current States and Development Plan of Research and Education on SSME in Harbin Institute of Technology

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Where is Harbin Institute of Technology?

Introduction to HIT-ICE

- **HIT-ICE ----**
  - **Research Center of Intelligent Computing for Enterprises in the School of Computer Science and Technology in HIT**
  - **We like ICE, because Harbin is also called Ice City.**
- **Strategic Vision of HIT-ICE ----**
  - Facing to the increased and changeable requirements of IT application in industrial society,
  - *research and develop on integrated, intelligent and inter-networked computing technology for enterprises and services.*

The Current States and Development Plan of Research and Education on SSME in HIT

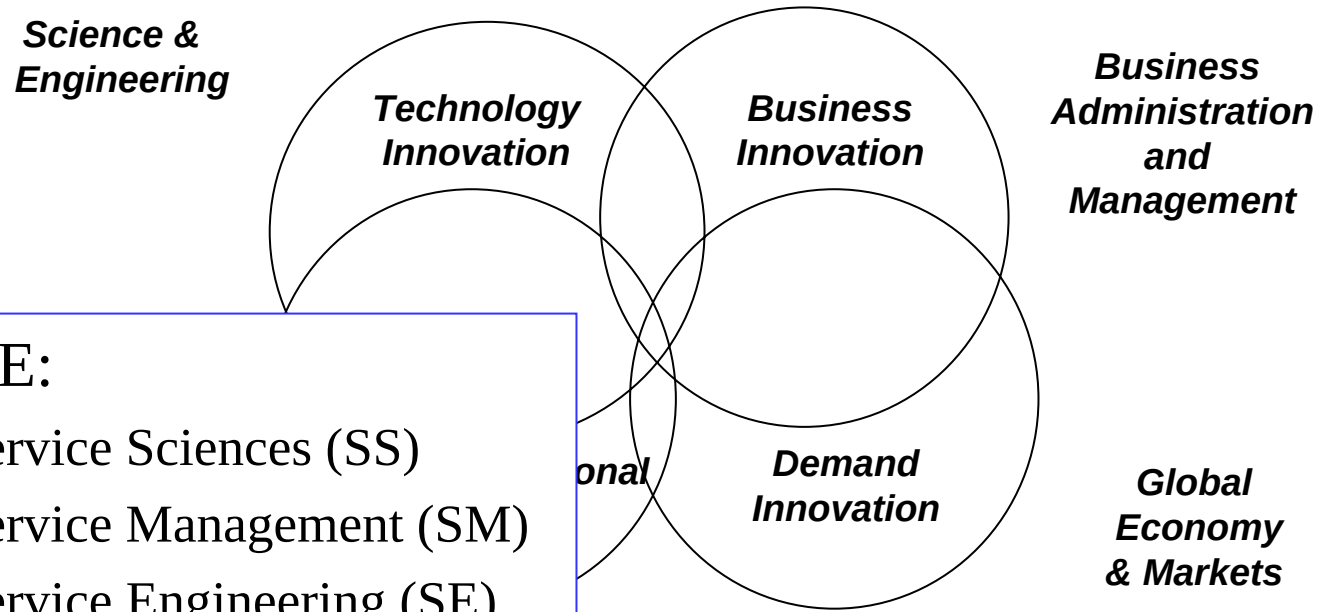
- Introduction
- The Current State of Research on *SSME* in HIT
- The Development Plan of Research and Education on *SSME* in HIT
- The Collaboration between HIT and IBM
- Conclusion

Introduction

- In the developed countries, more than 70%'s labor force are working for service industry.
- In China, the above number is 35% in 2004 and will grow up year by year in the future.
- The objectives of services:
  - In the right *time* schedules,
  - allocate the right *resources* (people and various resources),
  - to provide the right *services* to customers in '*on demand*' style,
  - to response to the requirements of customers.

SSME: Services Science, Management and Engineering

- **Service:** *A service is a provider-to-client interaction that creates and captures value while sharing risks*



- SSME:
  - Service Sciences (SS)
  - Service Management (SM)
  - Service Engineering (SE)

Introduction

- **Problems for services:**
  - How to describe and understand the customer requirements for services rapidly and soundly?
  - How to design and to plan the services and their behavior, and to schedule service processes effectively?
  - How to allocate the right resources for specific services?
  - What kinds of IT support tools and platforms are required to support interaction with customers and collection of the necessary data for the service tasks?
  - How to assess the performance of services?

Service Engineering

- In order to provide good services, it is necessary to apply service engineering including methodology, techniques, support tools and platforms, to support the service analysis, design, modeling, implementation and management in the service lifecycle.
- Information technology plays the important role in service engineering.

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The Current State of Research on SSME in HIT-ICE

- SSME and services engineering
- Service methodology
- SMDA: Service Model Driven Architecture
- SMDA oriented platforms for collaborative IT consultation
- Service reuse based on service components
- Service performance evaluation
- SOA based service systems
- Education on SSME

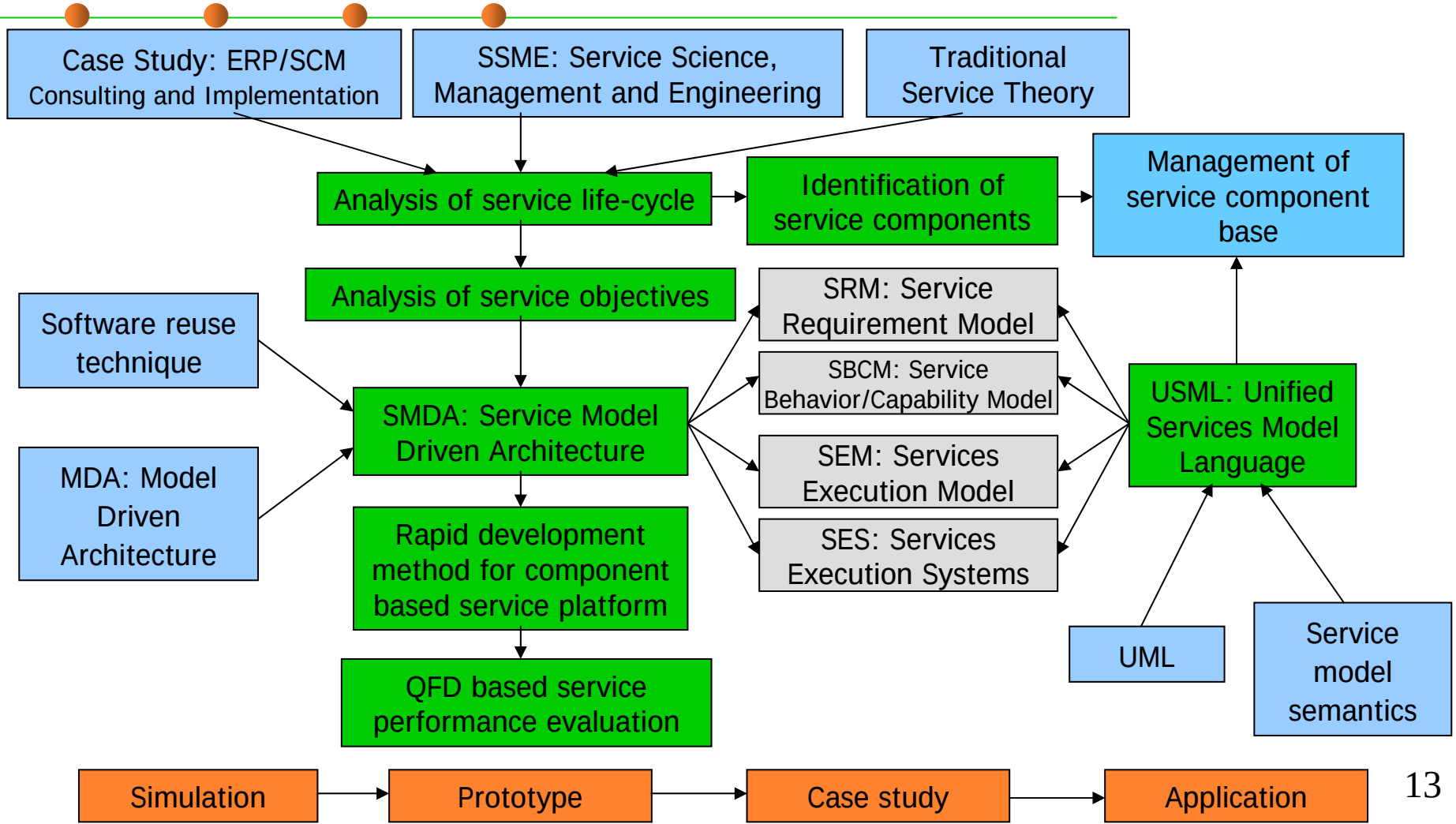
Service Methodology

- The integrated service methodology is presented for optimizing the performance of service systems to meet the rapid changed requirements and demand of customers.
- Main contents of service methodology
  - **Service models:** description and expression of services and service systems
  - **Service modeling:** model transformation for requirements analysis, design and implementation of service systems
  - **Service building:** guideline and principles for building the service systems
  - **Service evaluation:** performance evaluation of services
  - **Support tools and platforms:** IT tools to support the methodology of service engineering and the platforms for developing service systems

Service Methodology

- The related research work:
  - Service concepts and description, lifecycle and processes
  - Service models and modeling tools
  - Service oriented model driven architecture (SMDA)
  - Service methodology and rapid implementation methods
  - SOA based service systems and platforms
  - Service components and service reuse
  - Service performance evaluation and metrics
  - Case study on IT consultation in enterprises

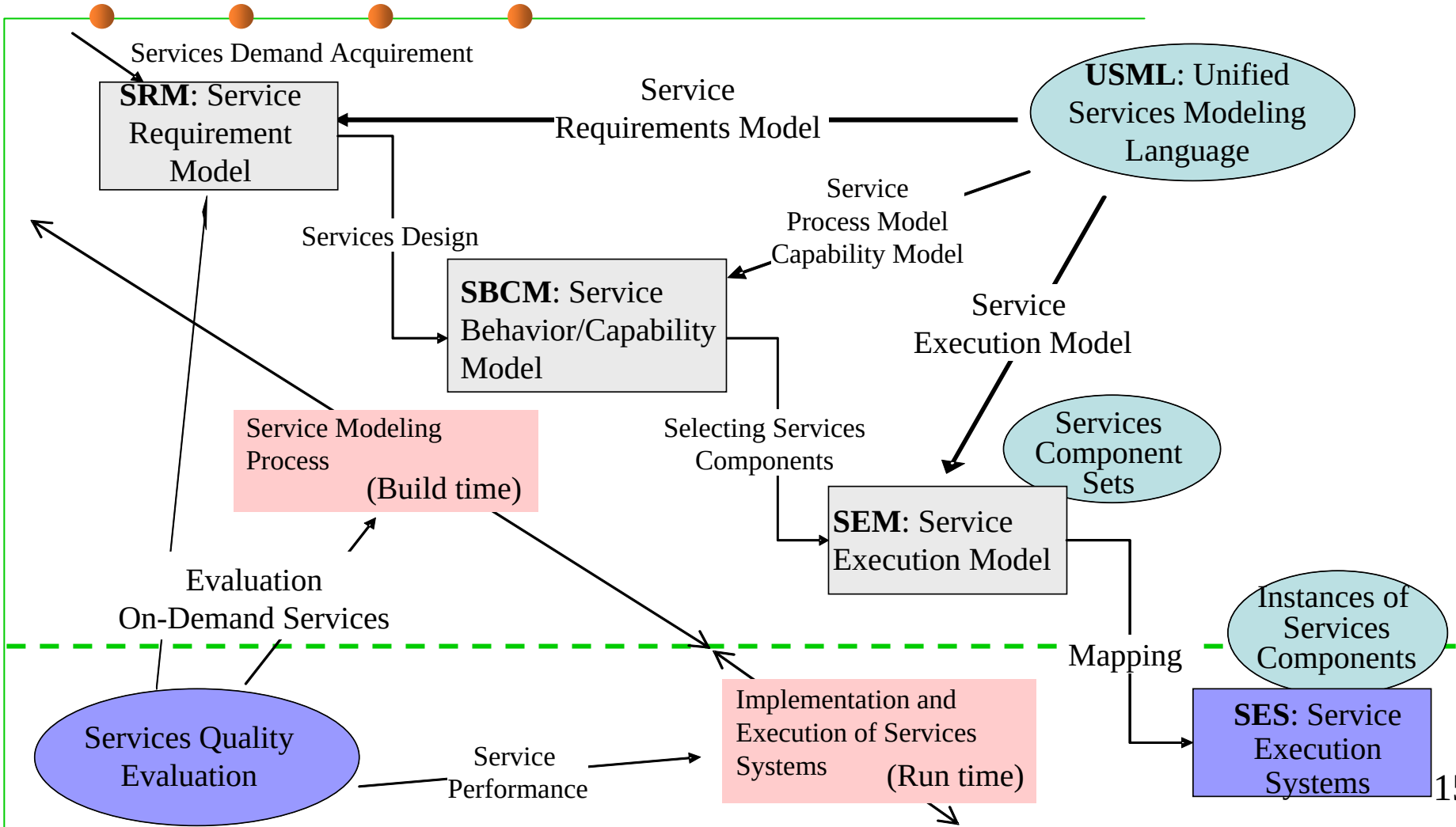
ICE Research Approach on Service Methodology



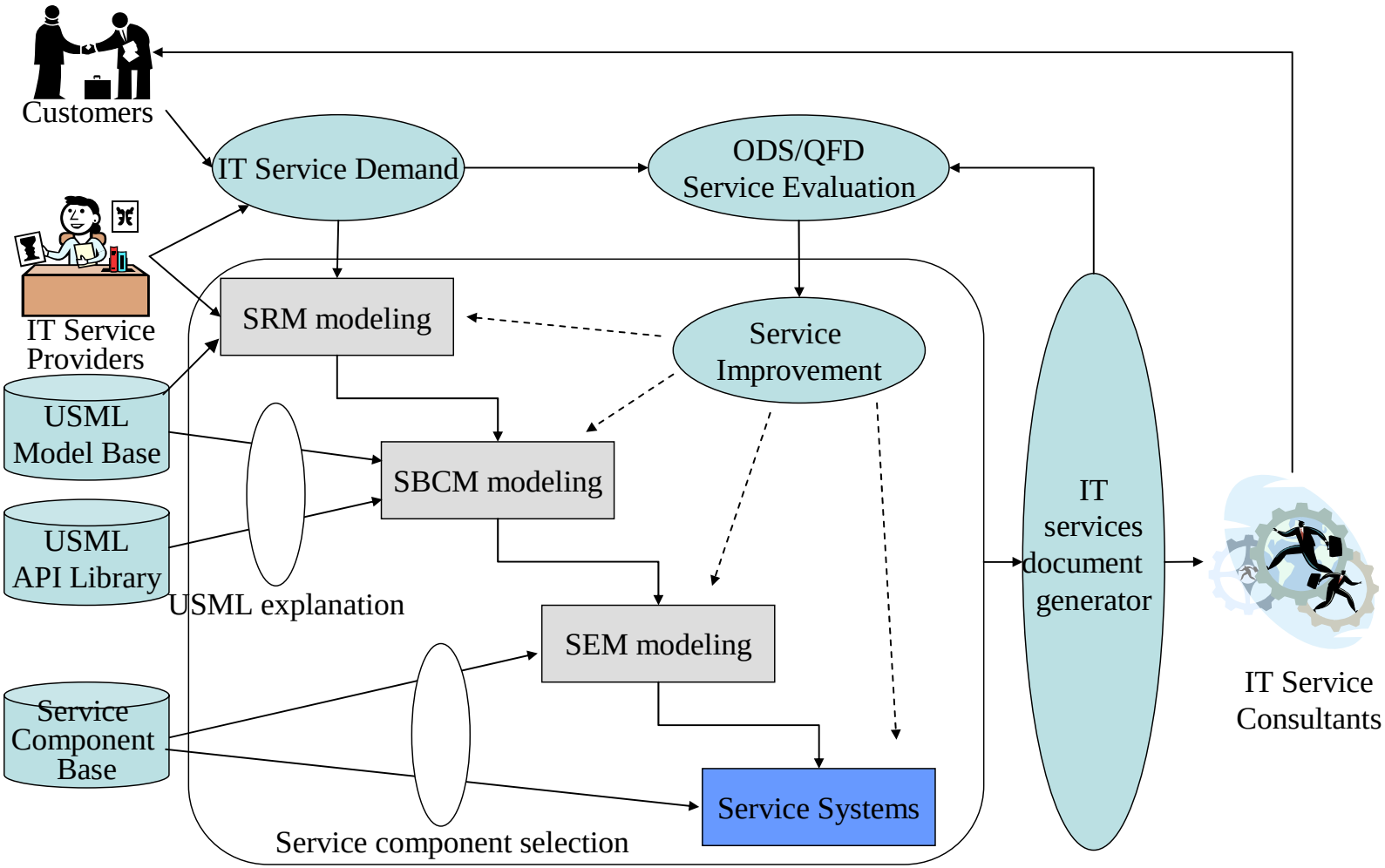
SMDA: Service Model Driven Architecture

- SMDA framework and methodology
- SMDA based service modeling and implementation
- Service behavior and multi-view models
- Service model semantics
- USML (Unified Service Modeling Language)
- Service components and service reuse
- ODS/QFD based IT service quality and performance evaluation
- SMDA modeling tool-kits and development platforms

SMDA Framework: Service Model Driven Architecture



A Case: IT Consultation in Enterprises



A SMDA based IT service modeling system

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The Development Plan of Research on SSME in HIT

- **Phase 1 (Theoretical and conceptual research)**
  - To clarify the concepts, scope, theory and metrics of modern services and SSME;
  - To research on life cycle of services and service engineering.

- **Phase 2 (Research on methodology and model)**
  - To analyze typical requirements, processes and behaviors of IT services;
  - To research on service model and methodology, architecture of service systems;
  - To present a framework of *the Service Model Driven Architecture SMDA.*

The Development Plan of Research on SSME in HIT

- **Phase 3 (Research on service modeling & tools)**
  - To research on the details of SMDA, such as multi-views of service models, USML, service modeling, service components, service semantics, implementation methods of the service systems, etc.
  - To present a detailed SMDA approach for IT services in enterprises.
  - To develop the support tools and platforms for service modeling and implementation.

- **Phase 4 (Application case study)**
  - Application case study on IT consultation services in enterprises .

Education on SSME in HIT: Course Development

- Development of new course on SSME in one year:

  Introduction to SSME and service engineering

  - Services and SSME
  - Service Engineering and Methodology
  - SMDA: Service Model Driven Architecture
  - SOA & Service Computing
  - Case study of SSME

- This course will be started in the fall term of 2006.

Education on SSME in HIT: Curriculum Development

- Development of a set of new courses and curriculum on SSME in the next three years:
  - Introduction to SSME and service engineering
  - Service behaviors and psychology
  - Service organization theory
  - Strategic management of services
  - Human capital management
  - Customer relationship management
  - SOA and service computing
  - Service methodology, etc.

Education on SSME in HIT: Division Development

- In the next five years, *a division of service science and technology* will be set up in HIT, to develop the discipline of SSME and to train the students on *services science*.
- The staff members from *School of Computer Science, School of Software, School of Management and School of Humanities and Social Sciences* in HIT are strongly interested in development of such a division.
- The well-known experts on *SSME* will also be invited to HIT as visiting or guest professors in this division.

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The Collaboration between HIT and IBM on SSME

- Collaborative relationship between HIT and IBM
  - Since 1980s, started;
  - In 1995, strengthened into HIT-IBM joint technology center;
  - In 2003, upgraded into HIT-IBM joint laboratory.
- In recent two years, HIT staffs have *participated several forums and workshops on research and education on SSME* organized by IBM.
- In the past year, HIT-ICE and IBM-CRL visited each other for several times for *collaboration on SSME* between two sides.

The Collaboration between HIT and IBM on SSME

- The joint research projects on *SSME* (*IBM-SUR*) in 2006 has been set up.
  - *Service-Oriented Model-Driven Architecture (SMDA) based IT Service Ecosystem: Modeling, Implementation and Evaluation*
- HIT staffs were invited as *visiting scholars* by IBM Visiting Scholars Program for the research on *SSME* in IBM-CRL and in HKU-ETI.
- Dr. James Ye, Dr. Thomas Li, the directors of IBM-CRL, are conferred as guest professors by HIT.
- More collaboration work will be performed.

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Conclusion

- The service industry is increasing very rapidly. The discipline of service science is appearing.
- SSME plays the important role in development of theory and technology of services.
- Service engineering and methodology are the kernel part of service technology.
- HIT has developed in the research and education on *SSME*, especially on service engineering and methodology such as *SMDA*, *USML*, etc.
- With the close relationship between IBM and HIT, the fruitful achievements in the collaboration on *SSME* will be obtained in the near future.

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