

Cyber-Learning/Distance Education WG Update

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1. Overview of CL/Distance Education WG
2. Review of CL/DE WG @ PRAGMA 28
3. Activities Done after PRAGMA 28
4. Meetings @ PRAGMA 29

1.1 Cyber-Learning/Distance Education WG



Objectives♪

- ➲ Providing cyber education & research environments in computational science
- ➲ Utilizing Computing resources & services in PRAGMA community
- ➲ Promoting developing & utilizing activities through global collaborations

**CL/DE W
G♪**

Activities♪

- ➲ Collaborating with Resource/Tele-Science/Bio/Geo Working Groups
- ➲ Co-developing and sharing of various simulation SWs and contents for Cyber-Learning/Distance Education in PRAGMA Community
- ➲ Sharing of information and experience on Cyber-Learning in PRAGMA Community
- ➲ Holding Joint Workshop/Seminar/Contest on Cyber-Learning
- ➲ Providing Cyber-Learning service to PRAGMA Community through Web Portal

Goals♪

- ➲ Development and sharing of Cyber-Learning open platform and various education/research simulation S/Ws for PRAGMA
- ➲ Establishment of international cyber-learning community and connections to higher education
- ➲ Construction of collaboration channels amongst PRAGMA members and among other WGs

1.2 Cyber-Learning/Distance Education WG



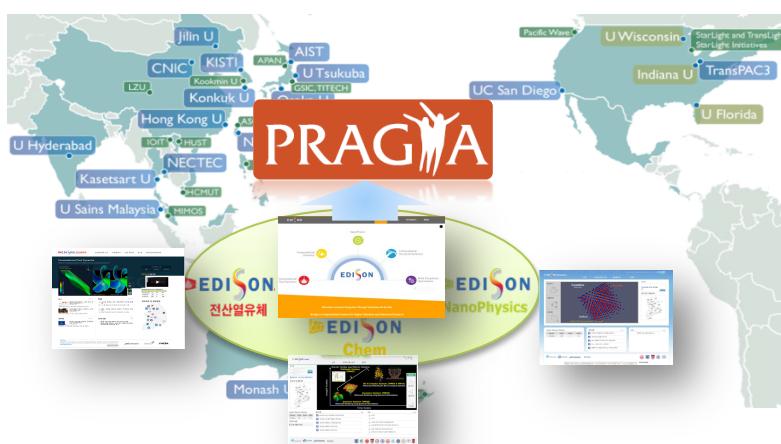
Expanding Cyber-Learning/Distance Education Community in PRAGMA(Pacific Rim Applications and Grid Middleware Assembly)

❖ Establishment of PRAGMA Cyber-Learning/Distance Education WG

- Proposing Cyber-learning/Distance Education WG at the 24th PRAGMA Workshop (2013.3 ~23, Bangkok, Thailand)
- Chair(Lee, Ruth), and Co-chair(His-Ching Lin, NCHC/Putchong Uthayopas, KU)

❖ Summary of Main Results

- **Promotion of CL/DE WG & Spreading CL/DE through EDISON to the PRAGMA community (Taiwan, Vietnam, Thailand and Hong Kong)**
- **Establishment of English EDISON web portal** & deployment of EDISON CFD@NCHC
- **Held a workshop on Cyber-Learning at PRAGMA 26** (2014.4.9~11, Taiwan)
- **“Korea-Taiwan International Joint Research Project ”** (13.7.29-15.7.28, \$100,000)



- **Breakout Session I : 15:30~17:00, April 9 (Thur), 2015**
@Nara Prefectural New Public Hall, Conference Room2
 - ✓ Participants : 8 People from China, Japan, US, Indonesia and Taiwan
 - ✓ Presentation on EDISON and FLEETs by Hsi-Ching Lin
 - ✓ Discussions for exchanging ideas, status, best practices, suggestion and etc

- **Breakout Session II : 14:30~16:30, April 10(Fri), 2015**
@Nara Prefectural New Public Hall, Meeting Room3
 - ✓ Participants : 1 Person from Taiwan
 - ✓ Discussions on future action and collaboration items among participants

Collaboration ideas for CL/DE WG and Resources WG

➤ Distance learning — video tutorials

- ✓ Share expertise among PRAGMA members — e.g., how to deploy a virtual machine (VM) via Rocks, OpenNebula, Ezilla, etc.
- ✓ Could be shared outside of PRAGMA — e.g., Beth integrated existing online videos as part of her Big Data MOOC class last quarter
- ✓ PRAGMA content can often be ephemeral — this would be a good way to hold onto knowledge
- ✓ MOOCs? Beth taught a Big Data class

➤ Expand usage of Edison software

- ✓ What functionality does Edison provide? Can we automate its installation — e.g., similar to Lifemapper installation automation work
- ✓ This could help increase interactions with other PRAGMA WGs — i.e., to create their own Edison portals (e.g., nanophysics)
- ✓ Hsi-Ching will help get us access to existing Edison portals to experiment and learn more about software

- **Online guidelines — seasoned developers helping less experienced developers**
 - ✓ Idea from Kar Long Chan (NAIST)
 - ✓ Inspired by gaming (e.g., warcraft)
- **Streamline access to resources for student experimentation (e.g., linear systems)**
 - ✓ Heru's students previously used FutureGrid and XSEDE
 - ✓ PRAGMA testbed should be a low-cost way to students to get access to resources for small-scale experimentation
 - ✓ Access to new technologies? — e.g., gpus
- **Suggestion: Cyberlearning members attend other WG sessions next PRAGMA (similar to Resources WG).**

2.3 To do list by PRAGMA 29 and afterward



- **Call for simulation solvers and education contents such as tutoria
ls developed by one of PRAGMA community members who are wi
lling to share and open them**
- **Other things to do and seriously consider ...**
- ✓ How to get more people attend to CL/DE WG from PRAGMA members? → Po
ssibly combining related WGs such as Resource WG, BioScience WG and CL/
DE WG, and etc
- ✓ How to and what to collaborate and integrate with other WGs?

Int'l Collaboration Project between KISTI & NCHC

- ❖ Title : **Korea-Taiwan International Joint Research Project**
- ❖ Duration of Project : **July 2013 ~ July 2015 (2 Years, \$100,000)**
- ❖ **Mutual cooperation plan between KISTI, Korea and NCHC, Taiwan**
- Jointly promote and apply simulation SWs for the purpose of education and research
- Identify research issues in the CFD and Nanophysics sectors and promote joint research
- Share latest research results to save development cost
- Expand mutual system users to cultivate cyber-learning communities
- Share computing resources, information, experience and ideas for the simulation-based cyber learning
- Facilitate researcher-to-researcher exchanges

National Center for
High-performance Computing



Supercomputing Center
The center of National Science &
Technology Information Infrastructure

NARLabs
National Applied Research Laboratories

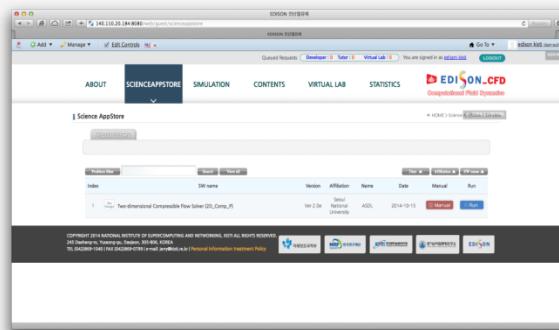
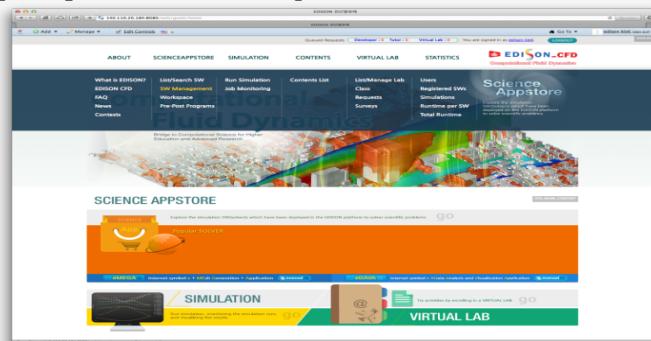
KiSTi
www.kisti.re.kr

Korea Institute of
Science and Technology Information

3.1 Activities Done After PRAGMA 28 (2/3)

Deployment of EDISON CFD Site at NCHC, Taiwan

- **Goal:** Boosting the CFD community in Taiwan relatively in a short time
- **Counterparts:** The EDISON team & Dr. H. KAN and Mr. Gary Wu@ NCHC
- **System specification**
 - **Hardware: 4-machine system setup**
 - 3 computing nodes, each with Intel(R) Xeon(R) CPU E5-2640v2@2.00GHz (8 cores, 16 threads) x 2, 48GB RAM, 838GB HDD by RAID5
 - One SSD-based Storage Server
 - Software: EDISON M/W (Job management/metadata framework) and application layers (Liferay-based portal) and one CFD content (2D_comp CFD solver and manual)
- **Deployment completion: June 2015**



3.1 Activities Done After PRAGMA 28 (3/3)

Deployment of EDISON CFD Site at NCHC(cont'd)

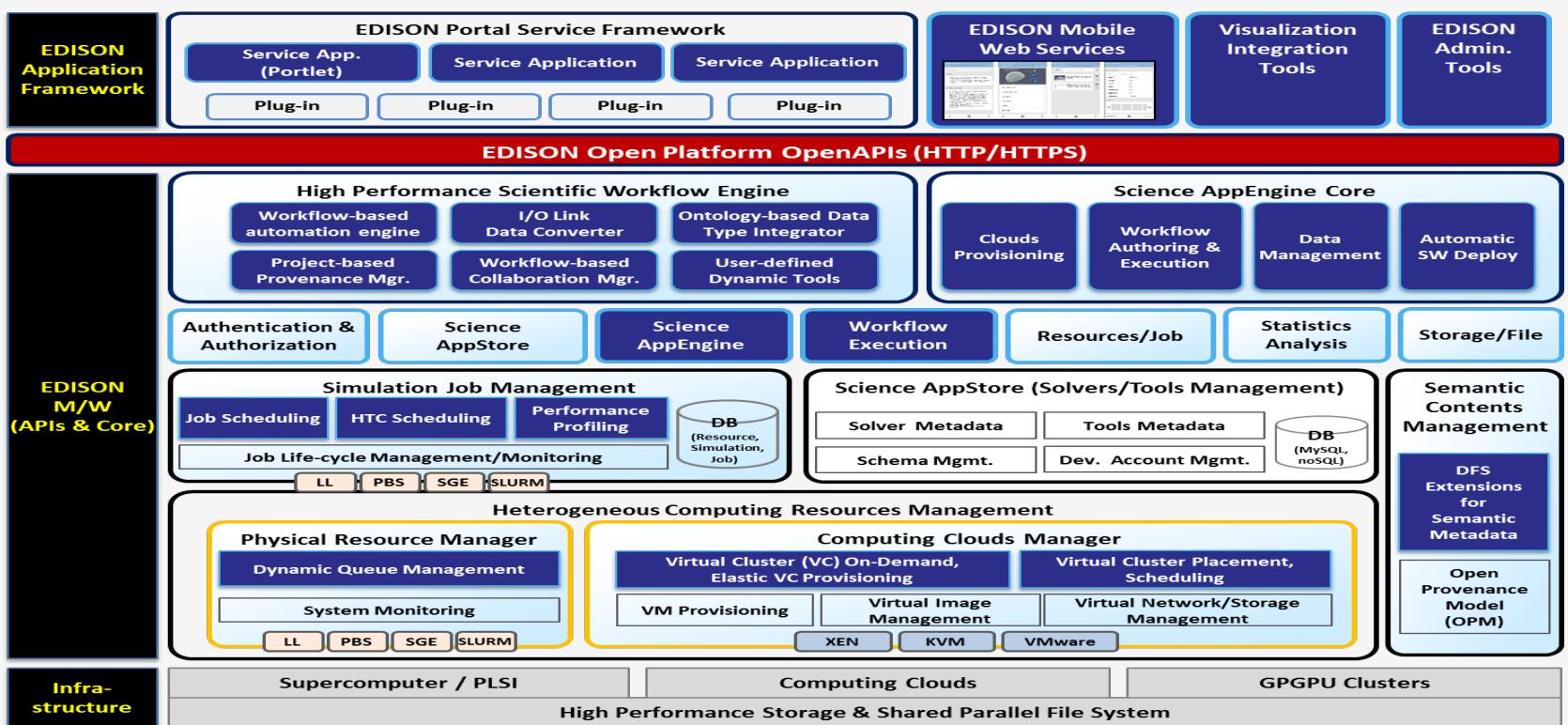
- Special Visits from NCHC from Sep. 21 ~ Sep. 24, hosted by KISTI
 - Dr. KAN and Mr. Gary Wu
 - Discussion1: **Some issues after deployment was resolved on**
 - Account management for domestic users
 - Chinese language support on the portal
 - Solver registration, deployment, and access
 - Portal management
 - Discussion 2 : **Expand collaboration opportunities**
 - Integrating big data analytics into EDISON for better resource utilization
 - Based on NCHC's prior experience on big data platform establishment
 - Developing other HPC research topics
 - Establishing KISTI-NCHC Joint Lab for constant collaboration



3.2 Activities Done After PRAGMA28@KISTI (1/3)

Core components of EDISON open platform 2.0 for CSE

- Establish web portal framework & web portal integrated environment of EDISON to support multidisciplinary computational science and engineering
- Development of core technologies for open platform such as Science AppEngine, optimization of workflow runtime engine & flexible provisioning of computing resources



3.2 Activities Done After PRAGMA28@KISTI (2/3)

History of EDISON Platform & Portals

Portal Service in 2011



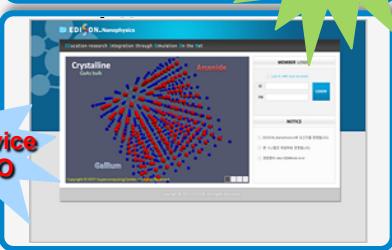
Pilot Service
of CFD

Portal Service in 2012

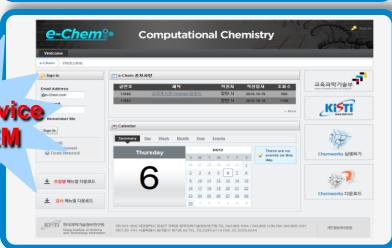


Formal Service
of CFD

Pilot Service
of NANO



Pilot Service
of CHEM

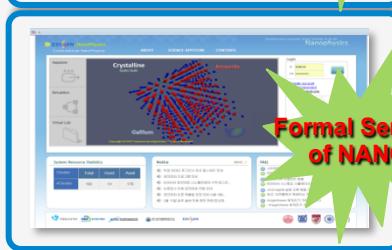


Portal Service in 2013



Formal Service
of CFD

Formal Service
of NANO



Formal Service
of CHEM

Portal Service in 2014



Formal Service
of CFD

Formal Service
of NANO



Formal Service
of CHEM

Pilot Service
of CSD



Pilot Service
of Design

Technology
Development

EDISON
Platform v1.0 α

Development of platform
in 2011 -2012

EDISON
Platform v1.0 β

Development of platform
in 2012 - 2013

EDISON
Platform v1.0

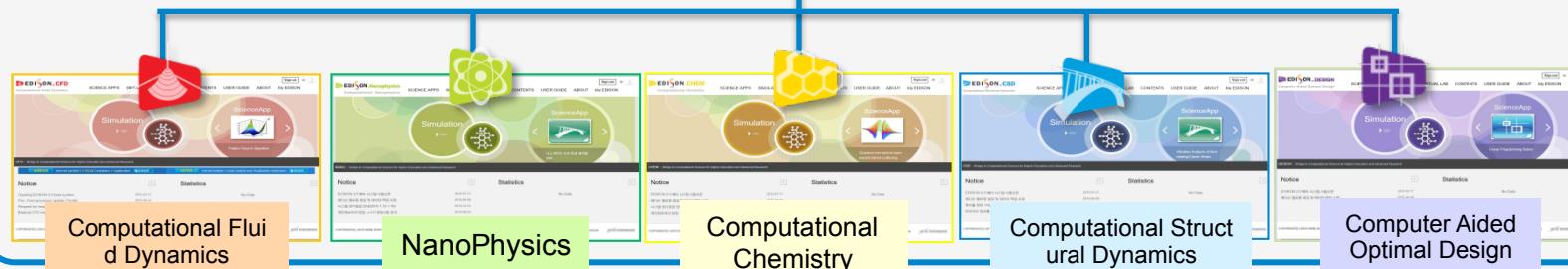
Development of platform
in 2013 -2014

EDISON Platform
v2.0 β

Development of platform
in 2014 - 2015

3.2 Activities Done After PRAGMA28@KISTI (3/3)

Integrated EDISON Portal



EDISON Platform v2.0^B

Application Framework

EDISON Middleware

Infrastructure



HPC



Computing Cluster

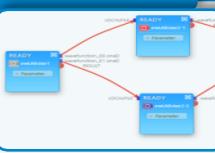


GPU Cluster

Application Framework



Science Appstore



Workflow System



Authentication Service



Statistic Service

EDISON Middleware

Icebreaker

Simulation/Job Manager
Physical Resource Manager
Virtualized Resource Manager

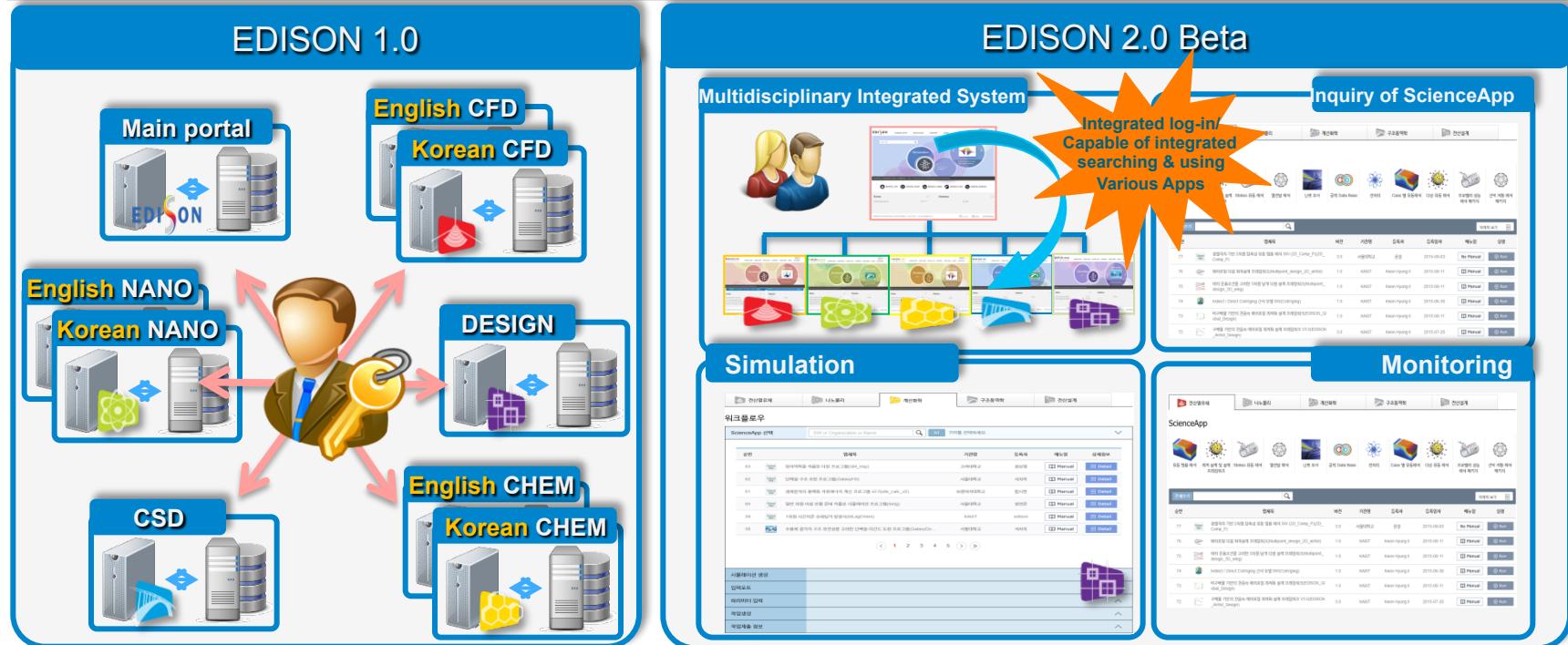
Spyglass

Solver/Tools Matadata
Pre/Post Processor Data
Schema Management

3.3 Excellence of Integrated EDISON Portal (1/4)

Possible to Multidisciplinary convergence study of CSE

- **Integrated log-in with ONE user ID**
 - Search, access & use various Apps of 5 areas of EDISON with one user ID
- **Integration of five ScienceApp databases for each domain field**
- **Search Apps & execute simulation jobs in 5 current computational science engineering areas through the EDISON main portal**



3.3 Excellence of Integrated EDISON Portal (2/4)

Multilingual support for Global users

- Capable of inputting all data input in Korean & English
 - Capable multilingual support including Chinese & Japanese (about 47 languages)
- Preparation the foundation for globalization on EDISON Platform and computational science & engineering ScienceApp

EDISON 1.0

The screenshot shows a registration form for a solver. It includes fields for basic information (Solver 이름: KOFI, Solver 등록번호: KOFI, 기관: KAIST), contact information (solver 이메일: KOFI@kaist.ac.kr, solver 빠른ID: 1.0), and developer details (개발자: KAIST). The interface is in Korean.

EDISON 2.0 Beta

The screenshot displays the EDISON 2.0 Beta interface. It features a 'Register ScienceApp' form with fields for app name (2D_YUIBRANS_1), category (가상경계기법 기반 복잡형상 난류 유동), developer (연세대학교), and contact information (최경일). Below this are 'Contents' (including a section on grid generation theory) and 'Questionnaire' sections. The interface includes tabs for 'Virtual lab' and 'Survey'.

3.3 Excellence of Integrated EDISON Portal (3/4)

Provide user-friendly manuals & various execution samples

- Apply user requirement :** Total 357 (314 cases solved & improved, 10 cases under progress, 33 cases under process by application center)
- Provide various sample files for easy execution of ScienceApp**
 - Beginner can execute ScienceApp with one click
- Provide the user guidance for EDISON portal & enhance personalization**
 - Provide one-click tutorial and detailed manual
 - Capable of easy grasping of using log and enhancing management function by providing My EDISON

EDISON 1.0

The EDISON 1.0 interface includes:

- Input port:** A section for specifying input ports, including dropdown menus for port type (e.g., INPUTDECK, OUTPUTFILE) and port name.
- Input deck:** A detailed configuration section for input decks, containing fields for file paths, parameters, and specific settings like "MyFile Type Sample".
- Simulation:** A section for managing simulation inputs, including file upload fields for param.inp, solute.inp, and solvent_300K.inp.

EDISON 2.0 Beta

The EDISON 2.0 Beta interface includes:

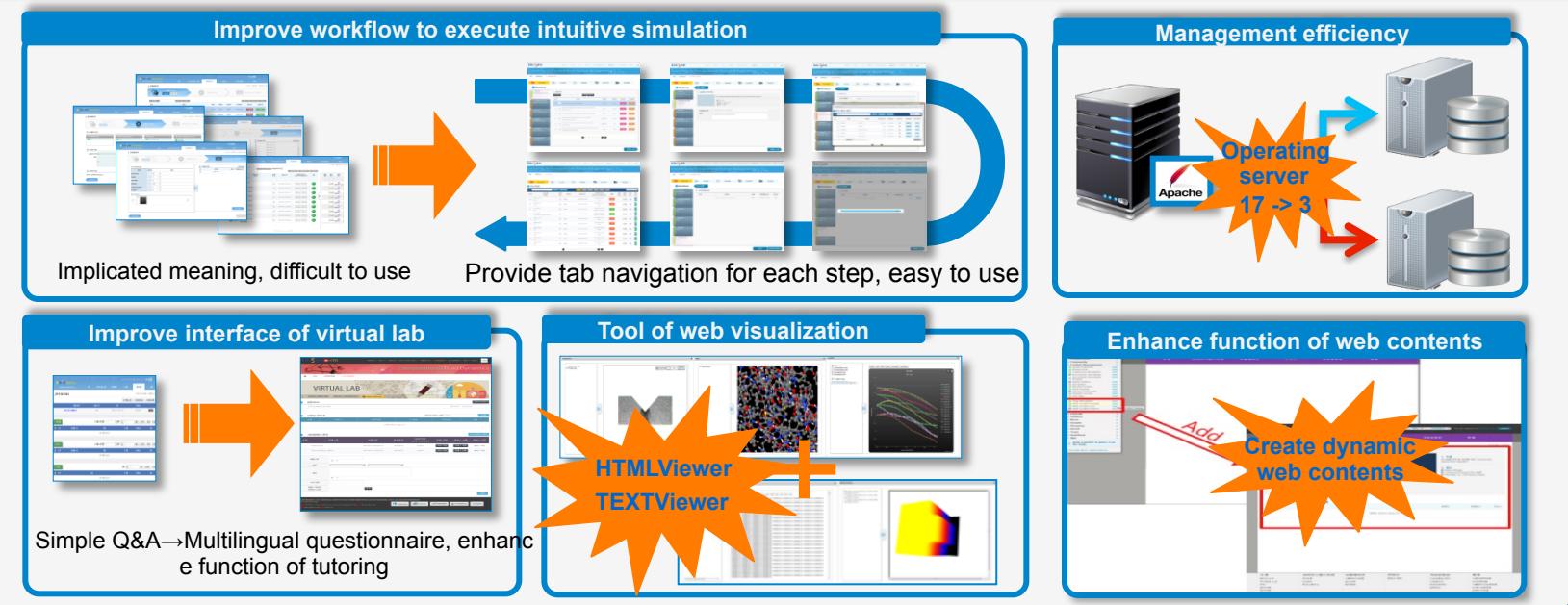
- Register input port sample file:** A form for registering input port sample files, similar to the Input deck section in EDISON 1.0.
- Register input deck sample file:** A form for registering input deck sample files, featuring more advanced filtering options like "External Potential" and "Sweep".
- Use input port sample file:** A section for utilizing registered input port sample files, showing examples for Fasta and ATOM formats.
- My EDISON:** A dashboard section displaying various status and log details.

3.3 Excellence of Integrated EDISON Portal (4/4)

Enhancement of integrated web portal framework for various CSE fields

- **Improve web portal framework by applying user requirements**
 - Provide the intuitive & easy user interface on simulation workflow & virtual lab that are difficult to use
 - Improve the performance of visualizing tool of web(improve the speed such as data loading and convergence graph drawing) and develop **HTMLViewer** & **TEXTViewer**
- **Strengthen the functions of management of portal, site & web contents**
 - Achieve efficiency of management by minimize operation servers from **17** to **3**
 - Realize duplication of servers to increase stability

Improve & enhance integrated web portal framework



4. Meetings for CL/DE WG@PRAGMA 29

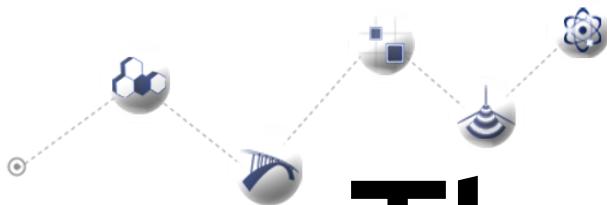


- **Breakout Session I : 14:00~15:30, Oct. 8(Thur), 2015 @ Room2604, 6th floor, Building B**
 - ✓ Discussions for exchanging ideas, status, best practices and etc
 - ✓ Open for any presentations on CL/DE

- **Breakout Session II : 10:30~12:00, Oct. 9(Fri), 2015 @ Room1219, Building A**
 - ✓ Discussions for future action and collaboration items among participants

Open for everyone.

Please come & join
Cyber-Learning/Distance Education WG!!!



Thank You!!!