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Plenary Session 4  
“Mutual Recognition and Standards”

**Sharing Common Concept and Understanding  
- A Condition for Mutual Recognition -**

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## Triggers of Globalization

- 1991 **Termination of Cold War Regime**  
triggered a chain reaction of Globalization!
- 1995/1 **WTO founded, policy target shifted**  
from ensuring free trade of goods to promoting  
mobility of human resources especially of specialists
- /11 **APEC Summit Meeting in Osaka**  
adopted a resolution to accelerate the mobility of  
registered engineers within the region

Forced to adjust domestic systems to cope with  
the changing external world.

Around 1995 we received an inquiry from an overseas organization.

“How many engineers are working in Japan?”

This inquiry was the start of our effort to compare Japanese engineers with their counterparts in the world and to recognize the existing gap in the **concept and understanding** of engineers.

# What are engineers?

Engineers  
in western world

技術者 –Gijutsusha-  
of Japan

Past  
days

Ambiguous!  
Plumbers, repairmen, skilled craftsmen and operators,  
foremen, draftsmen, designers, researchers, etc.  
Every practitioner in technology is called engineer.

Present

Well defined and  
categorized

Still ambiguous  
in spite of  
JABEE's effort

- The Washington Accord is a framework for the mutual recognition of the substantial equivalence of **engineering education** carried out in different countries and economies.
- The signatories should share the same definition of **engineering education**.
- ABET, Accreditation Board for Engineering and Technology of USA, distinguishes **engineering and technology education**. What is the difference?
- Before establishing JABEE, we needed to compare our **engineering education** with others and to redefine to make it compatible with global standard.
- Now, let's have a common understanding of **science, technology and engineering!**

# Science, technology and engineering

- 5000 years,  
Begin of  
Civilization

Science > knowledge

Technology > artifacts

- 300 years,  
Dawn of  
modern  
science

Human creation based on the  
past experience, traditional  
knowledge and trained skills  
backed by strong desire and  
ardor

Oracles

Pseudo science

Indigenous  
knowledge

Verifiable  
knowledge

Present

Science?,  
Technology?  
or  
Science and Technology?

# Japanese view

- 5000 years,  
Begin of  
Civilization

Science > knowledge

Technology > artifacts

Oracles

Pseudo science

Indigenous  
knowledge

Verifiable  
knowledge

Human creation based on the  
past experience, traditional  
knowledge and trained skills  
backed by strong desire and  
ardor

- 300 years,  
Dawn of  
modern  
science

engineers

Where are 技術者?

Science for  
Technology

Scientist

工学

Technologist

Technology Science

Present

Engineering is a science.

JABEE

# Western view

- 5000 years,  
Begin of  
Civilization

Science > knowledge

Technology > artifacts

Oracles

Pseudo science

Indigenous  
knowledge

Verifiable  
knowledge

Human creation based on the  
past experience, traditional  
knowledge and trained skills  
backed by strong desire and  
ardor

- 300 years,  
Dawn of  
modern  
science

Technology is created  
by a variety of human  
vocational activities.

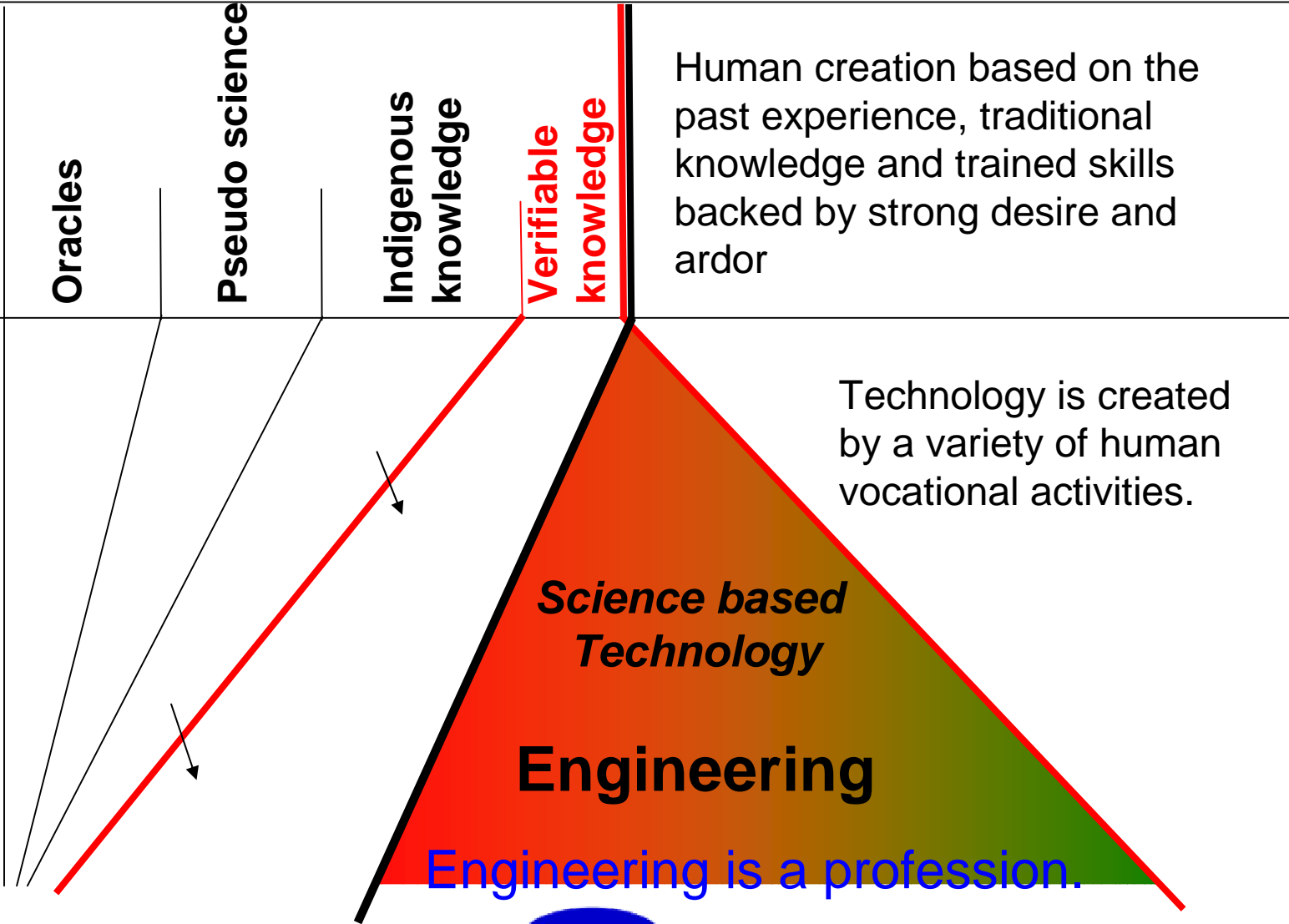
*Science based  
Technology*

**Engineering**

Present

Engineering is a profession.

JABEE





# Role sharing in science, engineering and technology

- 5000 years,  
Begin of  
Civilization

Science > knowledge

Technology > artifacts

- 300 years,  
Dawn of  
modern  
science

Present

Oracles

Pseudo science

Indigenous  
knowledge

Verifiable  
knowledge

Human creation based on the  
past experience, traditional  
knowledge and trained skills  
backed by strong desire and  
ardor

Scientist

Engineering  
Practitioner

Technologist  
in original  
meaning

Engineer Technologist Technician

# Framework for mutual recognition in engineering

- 5000 years,  
Begin of  
Civilization

Science > knowledge

Technology > artifacts

Framework for  
prof. qualification

Professional  
Engineer

Engineering  
Technologist

Engineering  
Technician

- 300 years,  
Days of  
modern  
science

Framework for  
education

Washington  
Accord

Sydney  
Accord

Dublin  
Accord

Criteria &  
standards

Engineering  
Education

Technology  
Education

Skills  
Education

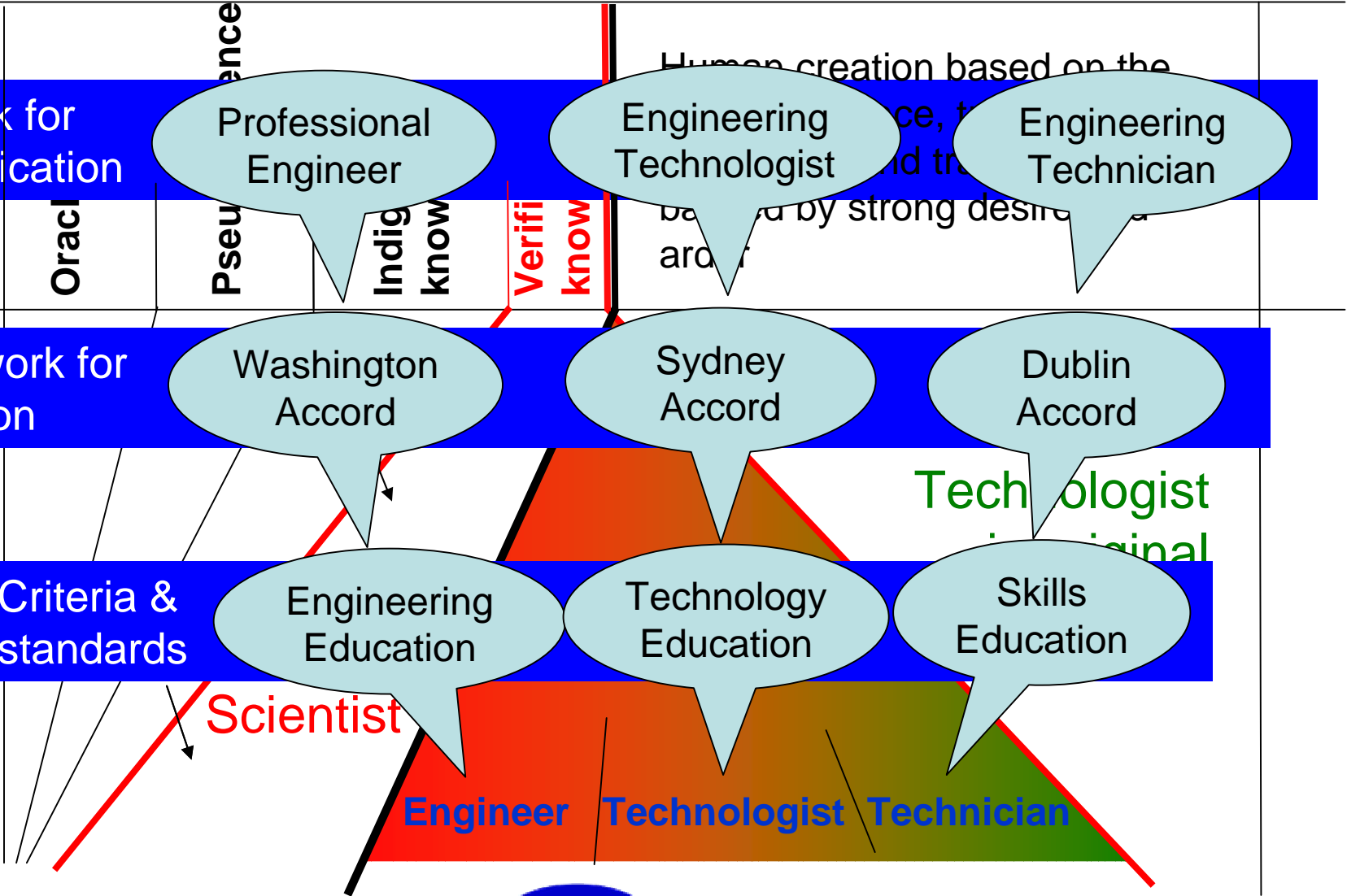
Technologist  
original

Scientist

Engineer Technologist Technician

Present

JABEE




# Categorizing Engineering Practitioners 1

Based on the Rules and Procedures of the Washington Accord

	Engineering Practitioner		
Title	Engineer	Technologist	Technician

## Attributes

Problems to cope with	Complex	Broadly-defined	Well-defined
Core competence	Application of Knowledge, Creation of new concept		Skills gained by training and experience



## Categorizing Engineering Practitioners 2

Title	Engineer	Technologist	Technician
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### Education and Professional Qualification

Required tertiary education	Accredited program, 4 years or more	Accredited program, 3 years or more	Accredited program, 2 years or more
Framework for mutual recognition of education	Washington Accord	Sydney Accord	Dublin Accord
Professional qualification	Professional Engineer, PE	Engineering Technologist	Engineering Technician

## Sharing common concept and understanding

- Urgently needed for the mutual recognition of professional/program accreditation that finally assures the **quality of professionals** worldwide.
- Institutional accreditation is principally to assure the **academic quality** within a nation/economy, however,
- In order to promote global mobility, it is vital to maintain the equivalence of academic degrees, **bachelor, master** as well as **doctor**, across national borders.
- In this sense, institutional accreditation is also a **highly global issue**.

Mobility of human power stocked in students, academics as well as professionals, is an important prerequisite for global co-prosperity!

**The End**