



SSME Conference - Education for the 21st century

Service Science, Engineering and Management and the role of Government in Developing Economies: a Brazilian perspective

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October, 2006

Federal University of Rio de Janeiro (UFRJ)



- Largest Federal Educational Institution in Brasil
- 2 campi
- 25.000 students
- Over 7.300 new students every year
- 141 undergraduate courses
- 87 Master programs
- 72 PhD programs

- Engineering School (Politécnica /UFRJ)
 - Oldest Engineering School in Latin America
 - Depart. of Industrial Engineering



- Engineering Graduate School (COPPE/UFRJ)
 - Largest Engineering Graduate School in Latin America
 - Production Engineering Program



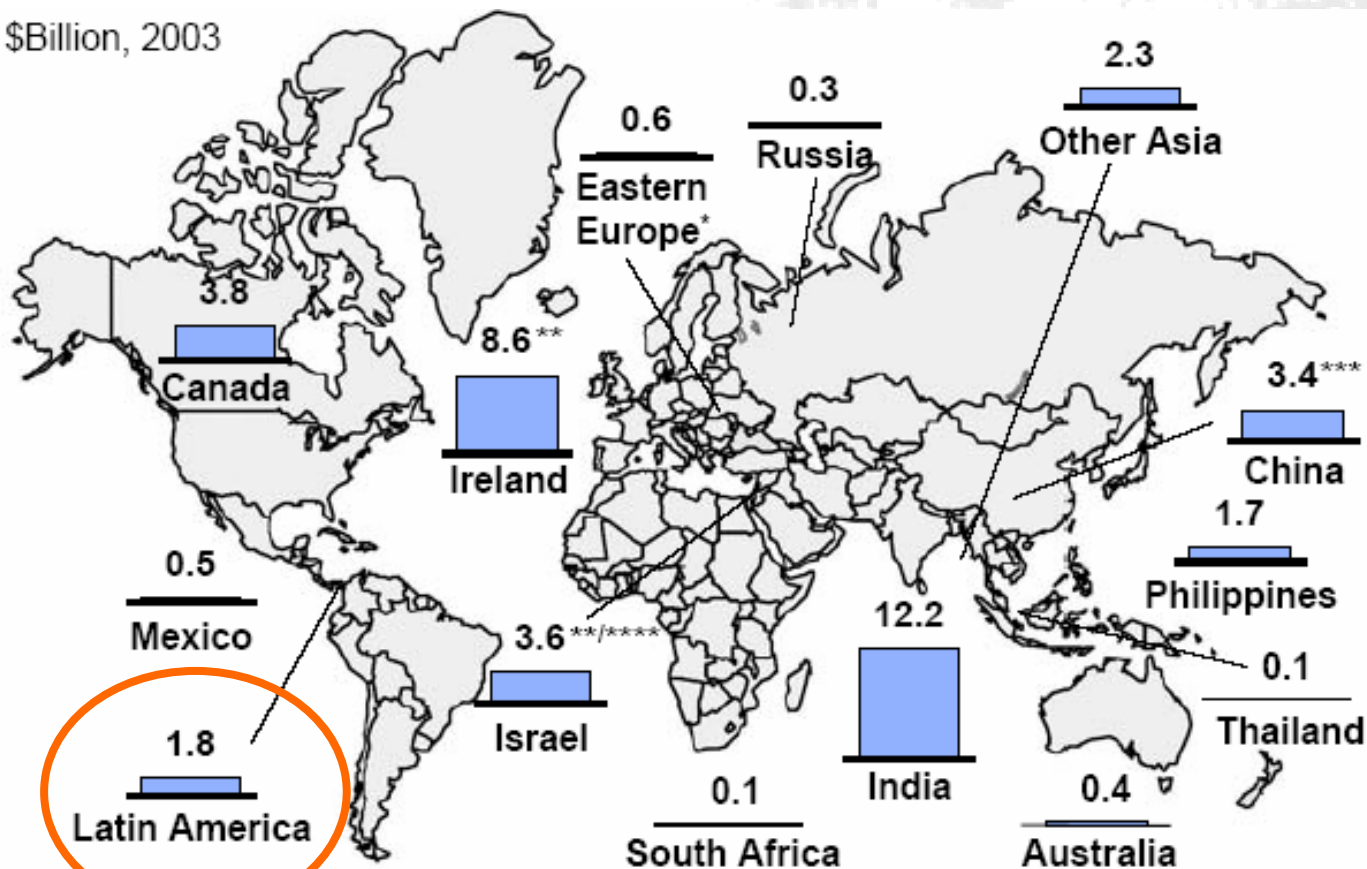
Focus on the Services Sector

- ❖ Study of IT-enabled services (IT and BPO)
- ❖ COPPE/UFRJ: Member of a Consourtim leaded by Carnegie Mellon University (ITsqc / CMU) to study services and sourcing relationships in the 'digital economy'
- ❖ Articulation with Government representatives and Brazilian enterprises to discuss the services sector and leverage opportunities for the country
- ❖ Main Educational Initiatives:
 - ❖ 'Service Engineering & Mgmt' discipline in M.Sc. (since 2005)
 - ❖ Executive Courses about Strategic Services Mgmt. (2006)
 - ❖ Professional and Academic Master in Service Engineering (2007)



The IT services world market scenario

\$Billion, 2003



* Includes Poland, Romania, Hungary, Ukraine, and Czech Republic.

** Primarily composed of MNC captives.

*** Estimate, based on total Chinese BPO and IT services revenue (7.8) minus domestic demand for IT services (4.4).

**** Estimate, based on 2001 market size of 3.0 and assumed growth rate of 20% p.a.

Source: Software Associations; U.S. country commercial reports; press articles; Gartner; IDC; Country government Web sites; Ministry of Information Technology for various countries; Enterprise Ireland; NASSCOM; McKinsey Global Institute analysis

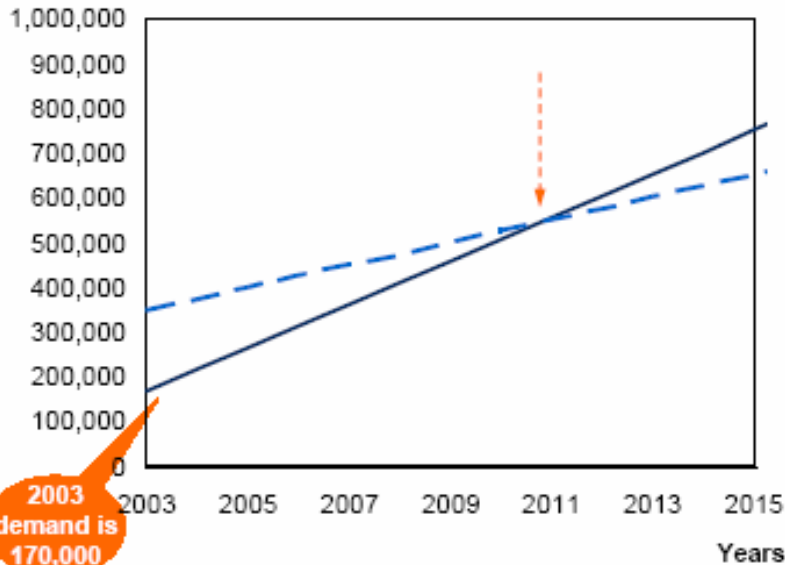
Source: McKinsey (2005)



There are opportunities for other countries that go beyond the usual suspects, and among them Brazil has a huge potential

US AND UK DEMAND COULD ABSORB THE ENTIRE SUPPLY OF SUITABLE YOUNG PROFESSIONAL ENGINEERS FROM CHINA, INDIA AND THE PHILIPPINES BY 2011

Demand (from US and UK) and suitable supply* (from China, India, and Philippines) for low-wage young professional engineers** FTEs



— Demand from US and UK
 - - - Suitable supply from China, India, and Philippines

2003 demand is 170,000

Top Ten Nations by Labor Force Size (about 50% of world labor in just 10 nations) A = Agriculture, G = Goods, S = Services

Nation	% ww Labor	% A	% G	% S	25 yr % delta S
China	21.0	50	15	35	191
India	17.0	60	17	23	28
U.S.	4.8	3	27	70	21
Indonesia	3.9	45	16	39	35
Brazil	3.0	23	24	53	20
Russia	2.5	12	23	65	38
Japan	2.4	5	25	70	40
Nigeria	2.2	70	10	20	30
Banglad.	2.2	63	11	26	30
Germany	1.4	3	33	64	44

>50% (S) services, >33% (S) services

* Supply forecast does not include effects of supply fragmentation and local demand.
 ** ≤7 years of work experience.
 Source: McKinsey Global Institute analysis

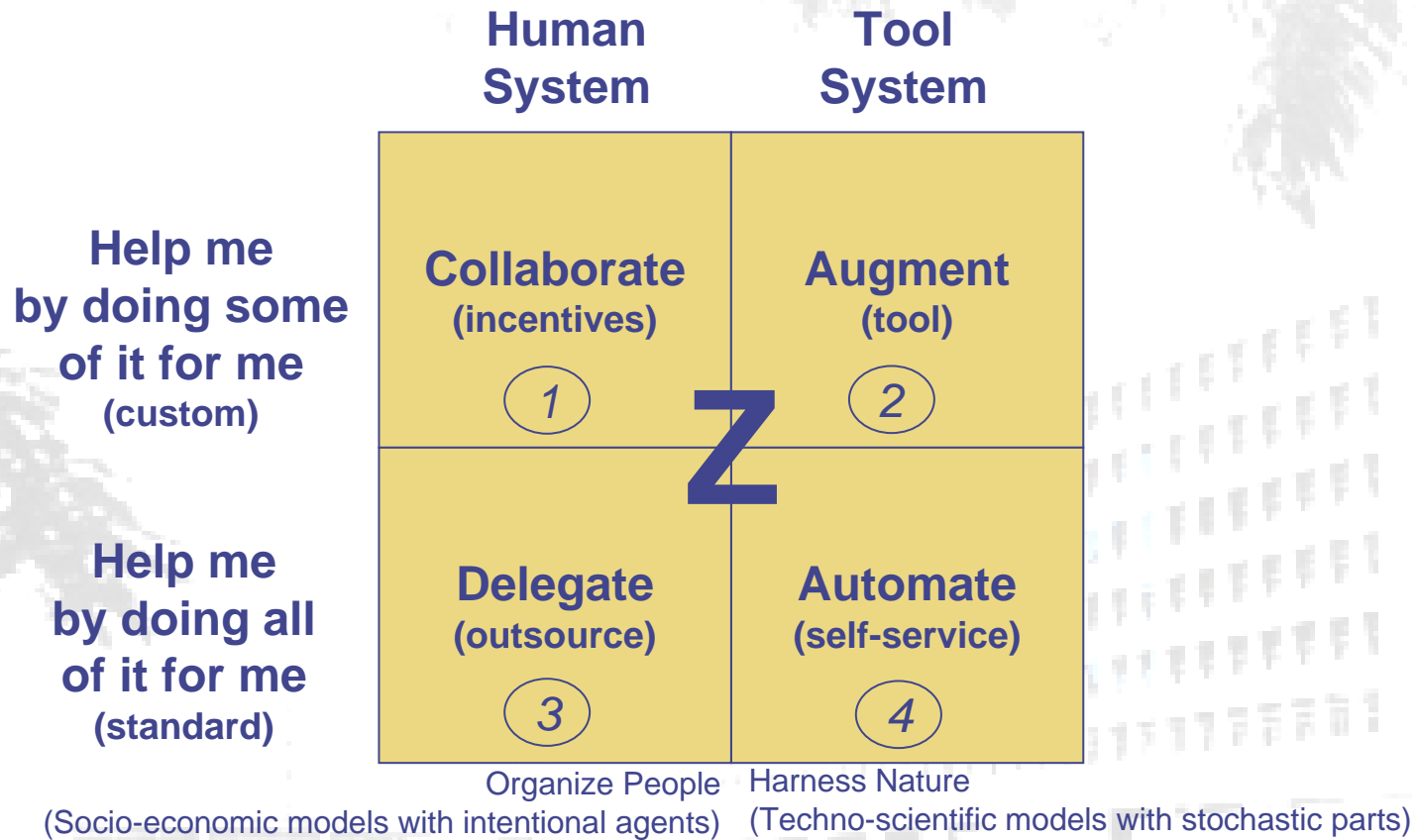
Source: McKinsey, 2005

Source: Spohrer, Ontolog Forum, 2005

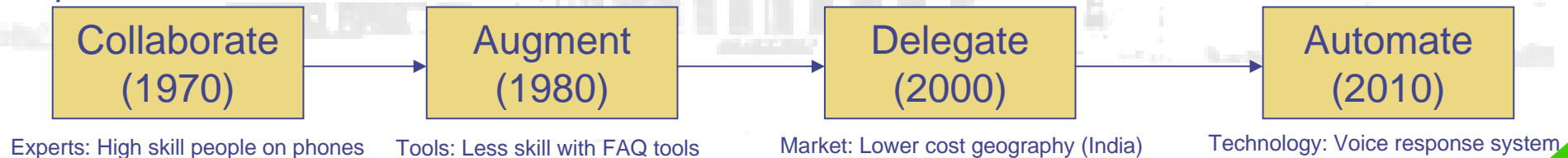


Issue: job offers change over time!

Based on Douglas C. Engelbart's
Augmentation Systems Framework



Example: Call Centers



Source: Spohrer, Ontolog Forum, 2005



So how is Brazil planning to compete in the IT-enabled services global arena?

Positioning: “High Solutionability”



Description of positioning

Solutionability

- **Positioning** — on the basis of its specialized resources and sophisticated domestic demand, particularly in certain vertical segments, Brazil is capable of offering innovative solutions and, if necessary, broadening the vision of the problem suggested by the client ensuring greater solutionability
- **Differentials directly** supporting this proposal
 - Technology innovation and updating
 - Specialization
 - Proactive approach
- Elements complementing the concept of proactiveness and strengthen the client relationship model
 - Proximity (geographical, time zone, cultural affinity)
 - Understanding of client industry/business

Source: A.T. Kearney BRASSCOM, 2005



Brazilian Industrial, Technological and Foreign Trade Policy (PITCE)

Focus on innovation

Long Term Policy

Vision for the future:

Change Brazilian industry pattern of competition through innovation as well as product and service differentiation, in order to be competitive in the international market

**Main Objective:
Foster the
innovation
capacity
of Brazilian
industry**

Source: Adapted from the Industrial, Technological
8 and Foreign Trade Policy Status, 2006



Industrial Policy Guidelines

1. Horizontal Policy

2. Strategic Options

Semiconductors

Software

Capital Goods

Pharmaceuticals
and Medicines

(and IT-enabled services)

3. Future Activities

Biotech

Nanotech

Biomass

Source: Adapted from the Industrial, Technological
9 and Foreign Trade Policy Status, 2006



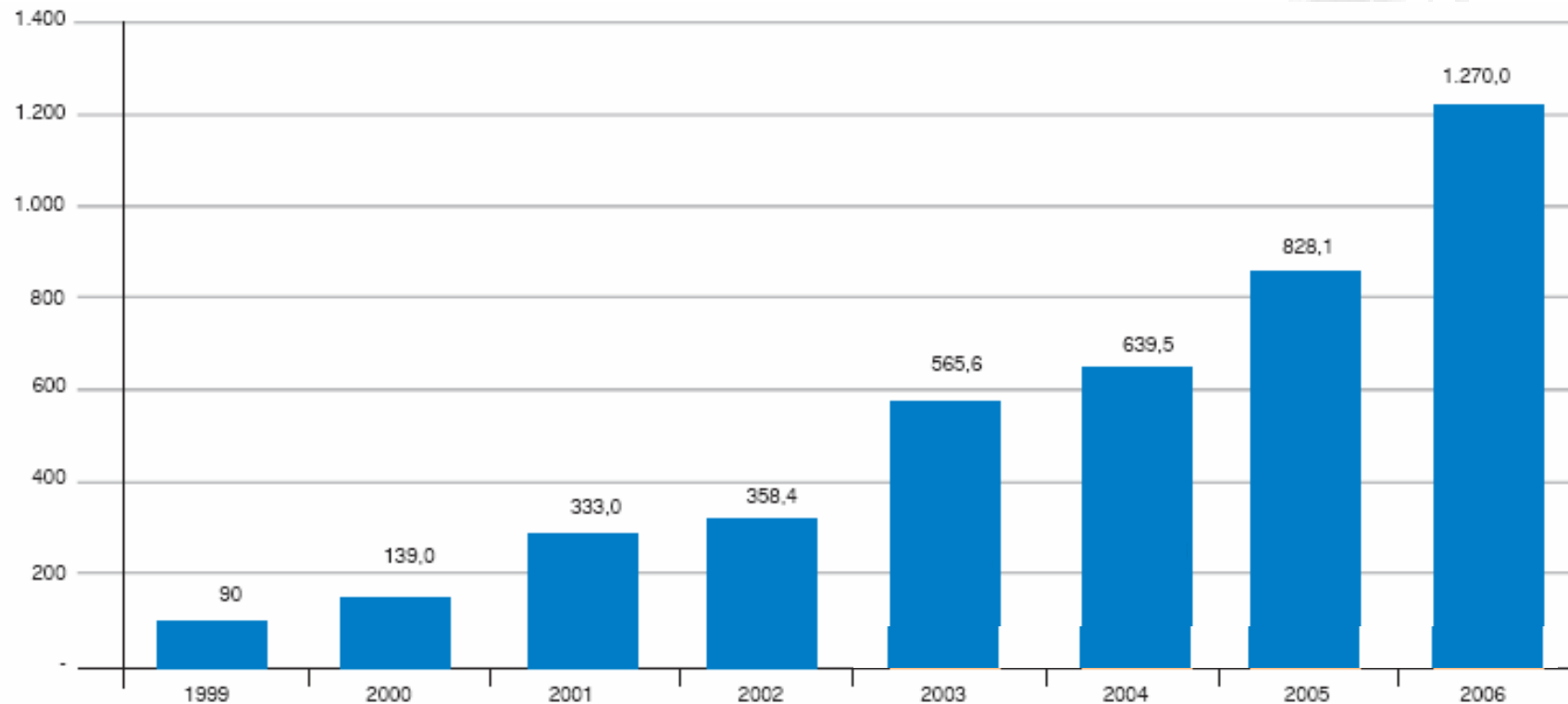
Brazilian Industrial, Technological and Foreign Trade Policy: some guidelines

- ✓ Simplify the Regulatory Framework (Innovation Law, 'Lei do Bem');
- ✓ Adopt new financing instruments and increase the R&D expenditure;
- ✓ Attract R&D Centers;
- ✓ Increase the number of Brazilian international firms;
- ✓ Develop plans for strong qualification of Human Resources

Source: Adapted from the Industrial, Technological
10 and Foreign Trade Policy Status, 2006



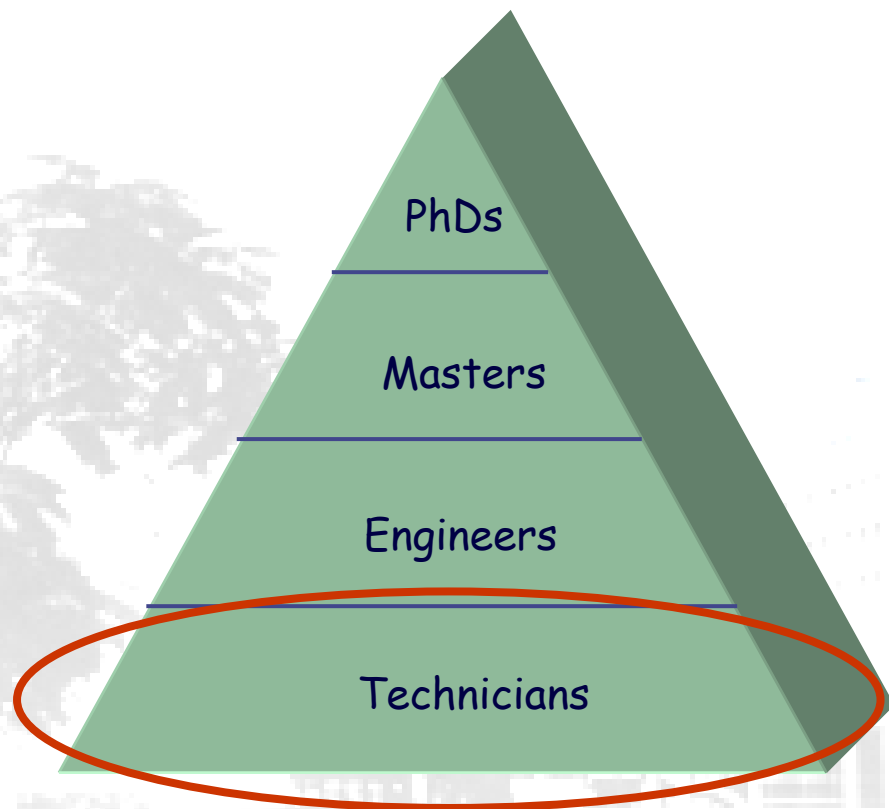
Government's growing incentives for R&D (R\$ millions)



Source: Industrial, Technological and Foreign Trade Policy Status, 2006



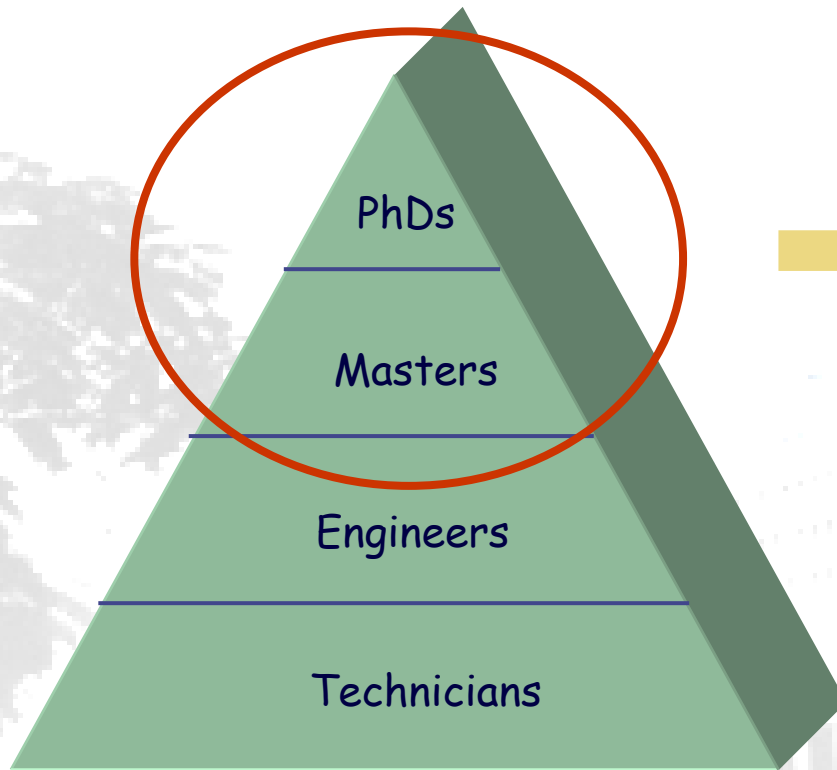
**Not only R&D Investments are needed:
an immediate challenge for the services market - to develop
technical skills**



Need for a large number of
professionals with technical skills



Sustaining a problem-solving and innovation strategy: the need for qualified personnel



Need for an increasing number
of PhDs and M.Sc., to sustain focus on
service innovation



Conclusions

- Federal Government has open ears in what concerns developing the “software and IT enabled services” industry. Also, there is a current need for technical personnel and top creative professionals in the field. So, there is policy and need and this is the moment to 'make it happen'.
- For the future, Brazil shall be targeting not only on increasing the ability to provide offshore services with more value added (such as engineering), but also and mainly on developing the innovative capabilities to pursue new service solutions and new business models for the service industry, in local and global contexts.





THANK YOU VERY MUCH

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