Concept Conference 2003

Can Lessons Learnt from North Sea Oil Projects Contribute to Successful Governmental Construction Projects?

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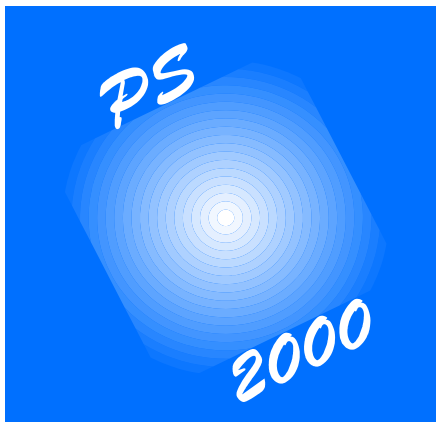
Presentation Outline

- Norwegian Centre of Project Management
- Experience from Offshore oil projects
- Lessons for governmental projects

Project 2000 - a Development Programme

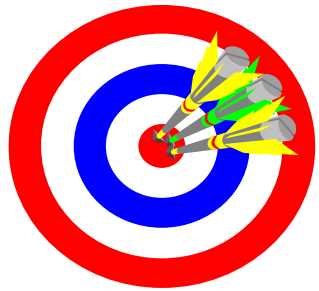


Vision:

Improving the competitiveness of Norwegian industry, by developing competence in the fields of identifying, evaluating, planning and executing projects.

Time horizon: 1. January 1994 - 30. December 1999

Objectives



1. To develop a new generation of project management tools and implement these in industry and government administration
2. To develop project management competence in industry and public administration to achieve optimal solutions.
3. To establish a multidisciplinary centre of expertise at advanced international level at the Norwegian University of science and technology

Project 2000 – Key figures

- 39 research projects executed
- 50 researchers involved
- 11 Ph.D. students
- 349 student project assignments and Master thesis carried out in industry and public administration
- 6 large conferences organised
- A large number of seminars and workshops organised
- 28 organisations involved

NSP is the successor of Project 2000

Norwegian centre of project management

PS 2000

NTNU

SINTEF

Members

NTNU

BI Handelshøyskolen BI

SINTEF

Members and partners

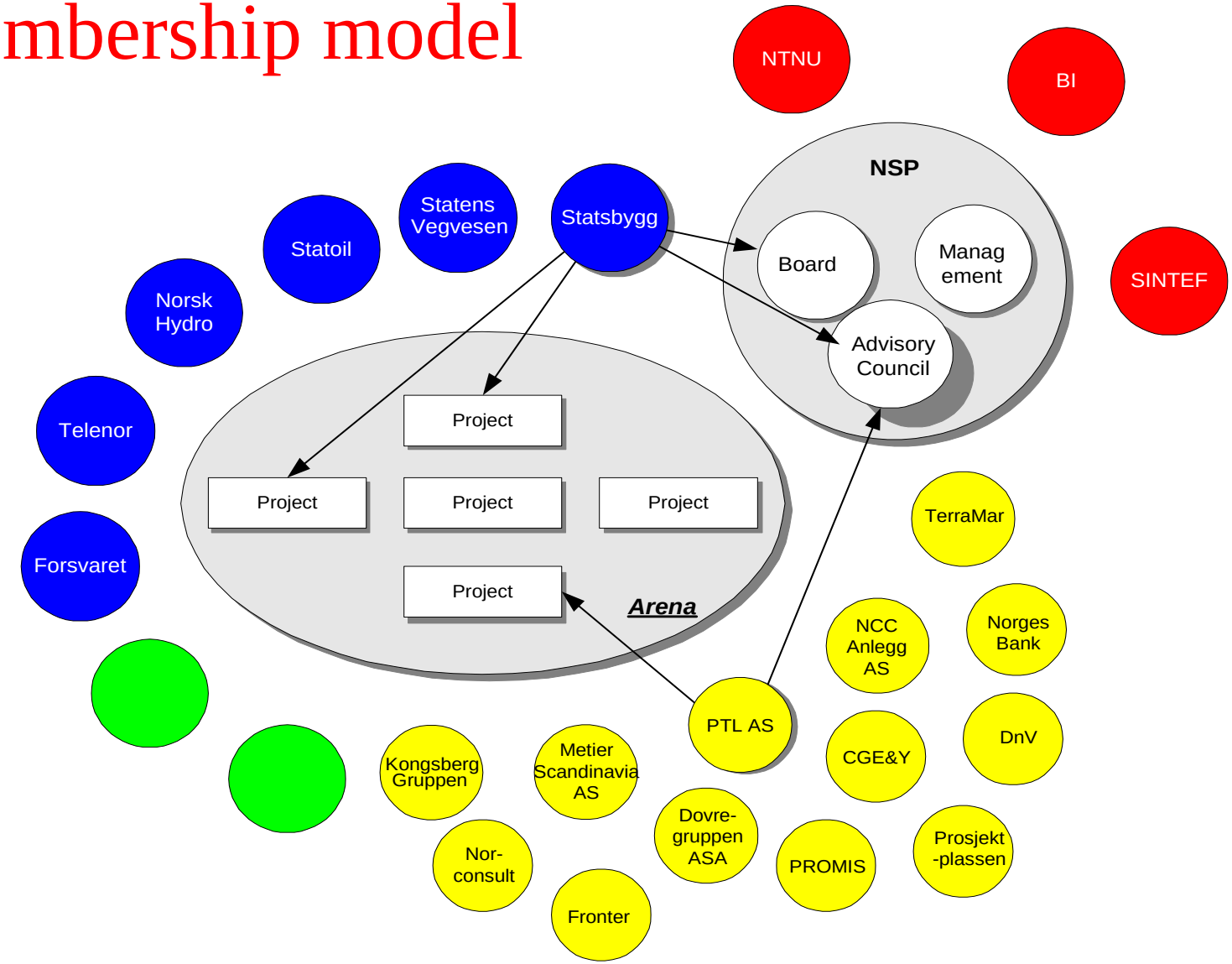
Vision

Development of project management competence at a national level for the benefit of the partners and members and for international recognition

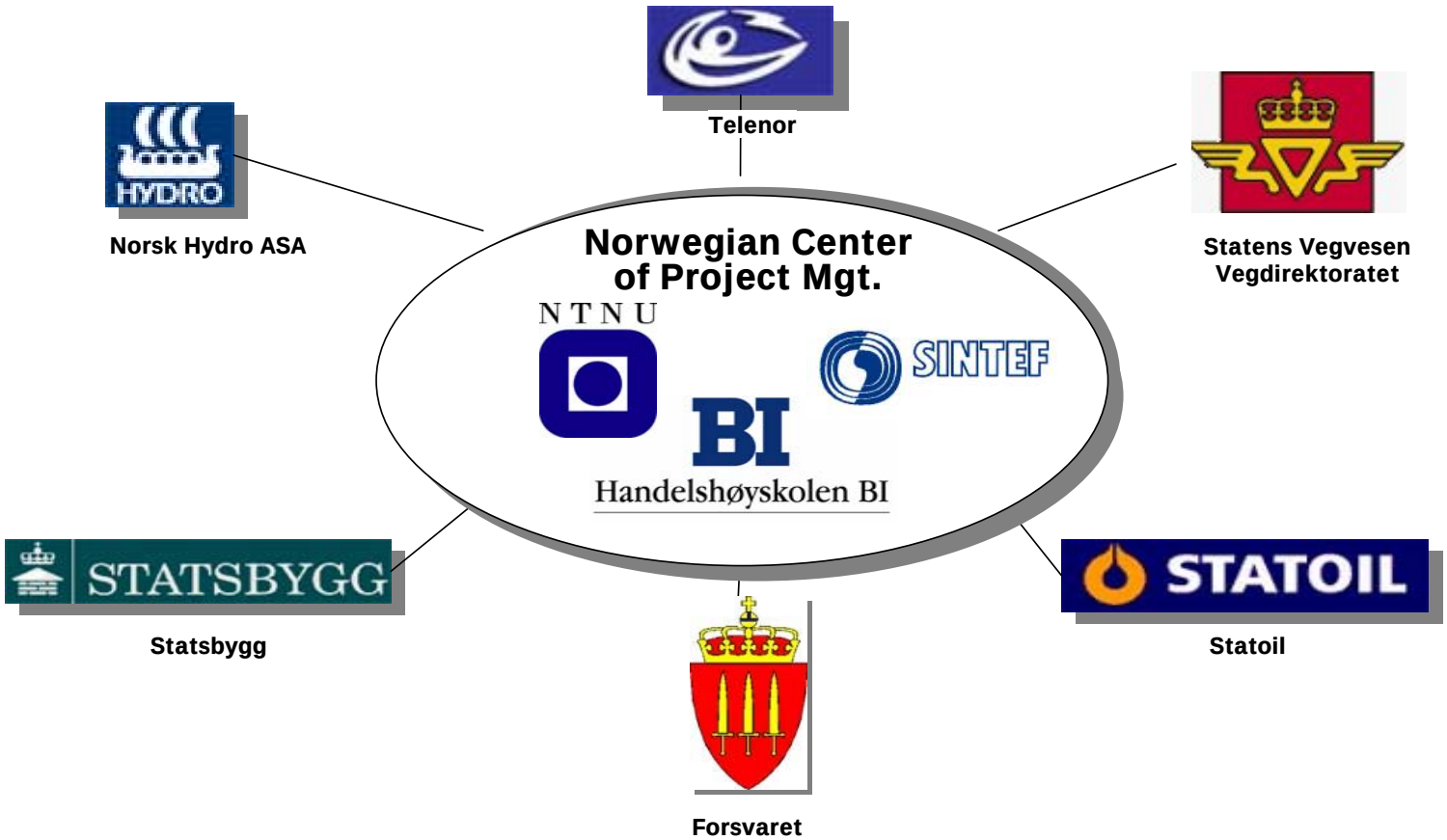
Areas of activity

- Research
  - Joint industry/academia applied research projects
  - Ph.D.s
- Education
  - Contribution to continued education at NTNU and BI
- Network
  - Workshops, conferences, newsletter, web, etc

Membership model



Founding members

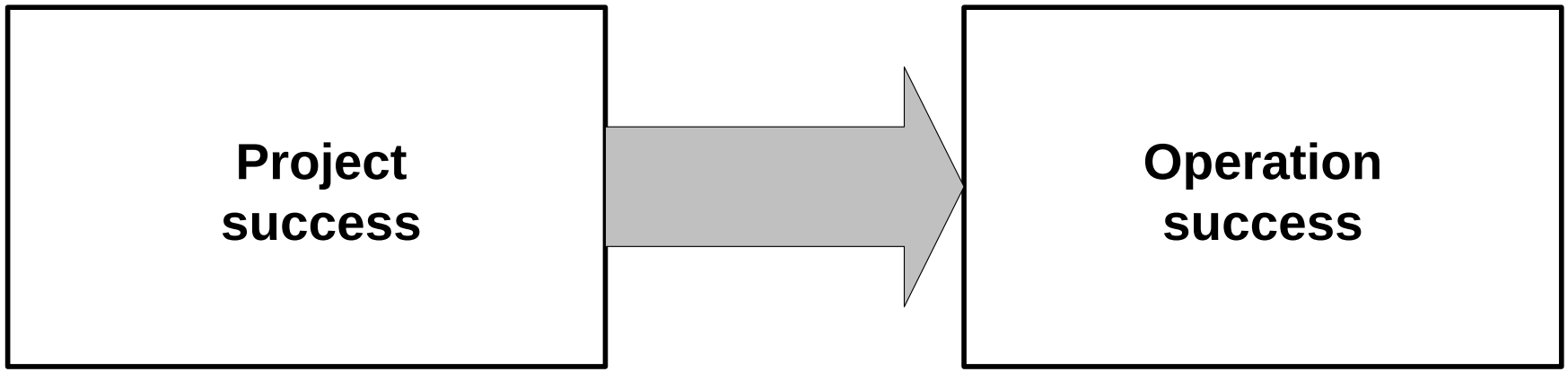


NSP Motivation

- Members can learn from each other
- Cooperation between industry and academia may lead to new innovations
- Providing a critical mass in project management at the national level
- International Collaboration

Cooperation with the Concept project

Project Success and Objectives



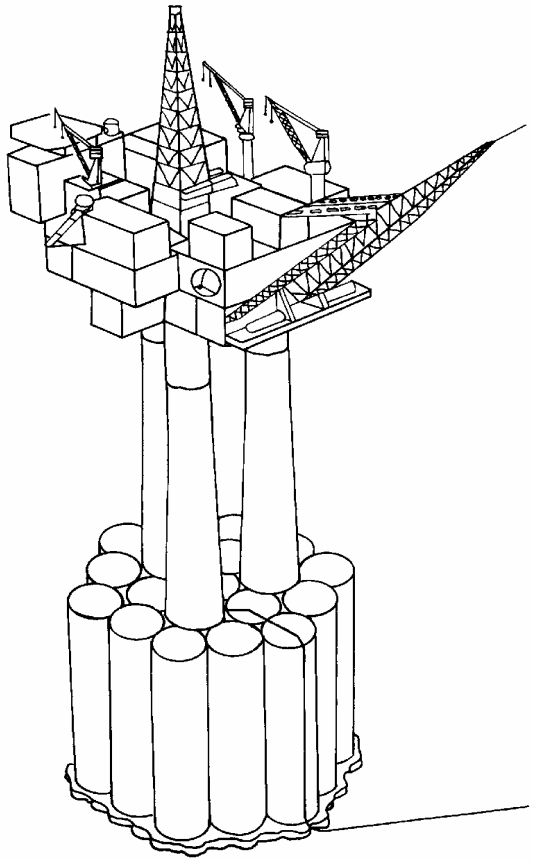
Project goals

Business goals

Generations of Offshore Projects

1. First generation (pioneer projects) 1970 – 1980
   - Ekofisk
   - Frigg
   - Statfjord
2. Second generation (mature projects) 1980 – 1995
   - Gullfaks
   - Oseberg
   - Mongstad
3. Third generation (effective projects) 1995 –
   - Åsgard

First Generation Projects



- First estimate 406 mill NOK
- 2 years delay
- 222% cost overrun
- Weight problems
- Engineering problems
- Offshore work problems
- One of Norway's most profitable projects

Cost study 1980

Cost category	Cost overrun
Engineering/mgt	469 %
Construction	140 %
Equipment	69 %
Transport/installation	167 %
Hook-up	1355 %
Insurance	96 %
Total	178 %

First Generation Projects Lessons Learnt

- Complex projects require advanced project management tools
- Traditional organisational models from the construction industry insufficient
- Front end engineering is crucial for success
- Split of work in phases improves controllability
- Risk analysis and contingency planning required

Second Generation Projects

- Risk robust estimates
- New project management systems
- New organisational model

Substantially overestimated

Mongstad oil refinery project

- Plan for extending refinery from 4 to 6.5 mill. tons
- Budget approved 1984: 4.5 bill NOK
- Critical comments from Ministry
  - No external partners
  - Statoil in a double role as buyer and supplier
  - Statoil itself took the role as the main contractor
- Kick off in August 1984

Mongstad estimate revision

- Pre-engineering finished autumn 1985
- New forecast at 1.6 bill NOK, increase of 1.6 bill NOK
- Final estimate of 4.8 bill NOK approved October 1985
- 300 mill to adjust for inflation from 1984 to 1985
- Discrepancy of 1.6 bill NOK covered by
  - 658 mill NOK simplified chemical process
  - 300 mill NOK productivity improvement
  - 300 mill NOK schedule acceleration
  - 380 mill NOK potential reduction

Mongstad project execution

- January 1986 – major delays and cost overruns
- January 1987 – project out of control, media attention
- Frequent estimate updates
- Most of the contingency spent during start phase
- Independent study launched fall 1987
- New estimate of 9.2 bill NOK reported to Parliament
- New overrun spring 1988, costs above 10 bill NOK

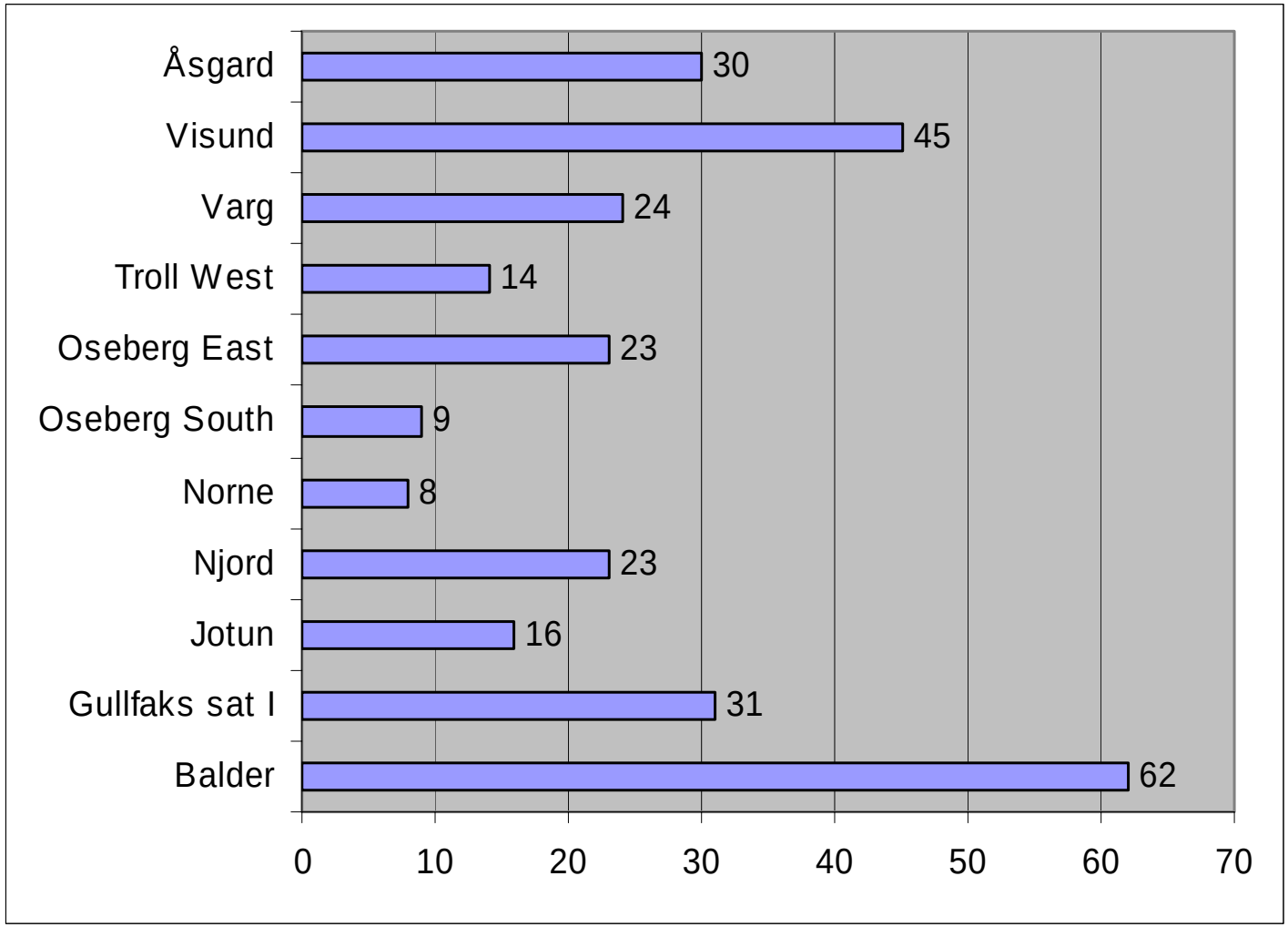
Mongstad - lessons learnt

- Political goals can influence professional judgement
- Delays in early engineering can be damaging to project success
- Large, complex projects need an external control mechanism
- To improve profitability by acceleration of a delayed project is an illusion

Third Generation Projects

- CRINE study in UK
- NORSOK study in Norway (1995)
- Cost and schedule reduction of 40 –50%
- New execution model
  - Risk and responsibility sharing
  - Trust and partnership
  - Reduced amount of documents
  - Standardised design

NORSOK Cost Overrun



NORSOK Experience

- Less contingency in contracts and unrealistic estimates
- New execution model created cooperation problems
- New suppliers from low cost countries lacked experience
- Shortened execution time involved increased risk
- Contractors lacked experience as main contractor
- Substantial reductions compared to second generation projects

Third Generation Projects Lessons Learnt

- New models like NORSOK requires attention and change by all stake holders
- There was no estimating baseline for the new model
- Time critical projects are often started on insufficient engineering and design
- Risk analysis is crucial for this type of projects

Success Factors - Offshore Projects

- Risk and contingency plans
- Front end engineering
- Project organisation – contract strategy
- External control mechanisms
- Owner – contractor partnership model
- Decision gate project control model

Unsuccessful Governmental Construction Projects – What Do They Have in Common?

- Strong political and user influence leading to a number of changes at a late stage in the project
- Unclear interface between the users' (owner's) responsibility and the project's responsibility
- Risk management insufficiently handled

Some Differences

- User influence and political pressure
- External control
- Organisational model
- Contract standards and practice
- Supplier culture
- Change process – disputed variation orders
- Productivity and progress control
- Governmental approval

What Can Construction Projects Learn?

- Stronger focus on front end engineering, risk analysis and contingency plans
- Develop a governance strategy including best practices for the decision chain from political bodies to users
- Simplify organisation model and contract strategy
- Enforce productivity and progress control – develop competence at governmental bodies
- Revise contract standards
- Adopt the offshore project model (NORSOK cooperation model, external control, decision gates)

What Can Research Offer?

- National research program to develop new concepts and learn the project mechanisms
- Develop a benchmarking program based on a project maturity model
- Seek international cooperation
- Implement doctoral program
- Pre-qualify suppliers based on competence