Building scientific computing capacities is an asset for development

Mohamed JAOUA

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New paradigms for development have upsurged
Is this new economy fit for DC?

- **What does it need?**
  - A properly educated population
  - Skills in Maths and computing
  - Computers ... but they are cheap😊

- **New paradigms for development have upsurged thanks to**
  - The digital revolution
    - Modelling has become the core
    - Targets are rapidly moving from high tech applications to every day ones
    - The digital gap is easier to bridge than the industrial one was
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  - The globalization
    - Industrial production is no longer local
    - Technologies needs to be processed in any place at their current level

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  - The globalization

- Which gives a second chance to DCs
  - Required skills are equally new for all
  - And a new deal: those who master the bases can compete, the game is open

Can a DC really compete? 
A mufflers story ...
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  - Metallic sheets
  - Machines to profile them and manufacture various sections and dimensions pipes
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  - Copy and paste is not the solution unless your clients are the car constructors …
  - Which is unlikely if the only commands you master are « copy » and « paste »
Can a DC compete?
The mufflers story ... continued

- Designing a muffler the traditional way
  - Use a (simple) plane waves model
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  - Set up a digital test bench: a computation would need only hours, if not minutes
  - Only when satisfied, manufacture the prototype and go to test it on the bench

Can a DC compete?
... a tunisian experience
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What made things work
Can a DC compete? 
... a tunisian experience

What made things work

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3. Already available skills in numerical modelling
Building capacities in numerical modelling ...

1983-2003: The ENIT-LAMSIN

- A « built from scratch » Applied Math laboratory
- Relying on a serious mathematical background however
- 80 researchers: 30 PhDs, 12 Professors, dozens of PhD students
- Fine publication records in international journals
- Master and Doctoral School in Applied Maths

Gained an regional role, and an international recognition

- UNESCO Chair « Maths and development » - awarded 2002
- Research teams associated to INRIA and CNRS

An indeed international place

- Collaborative research on mutual interest topics
- Co-advised PhD theses
- Conferences and networks (TamTam, PICOF, CARI, Lirima)
Capacities building: Elements of an heuristic strategy

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- **Jealously preserve scientific independence**
  - However a global policy is crucial
  - In Tunisia, 1996 has been the turning point

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- And finally, better have a little bit luck 😊
A couple of lessons we learnt

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☐ Governance is a crucial issue for the future
  ▪ Scientists should make the scientific decisions
  ▪ Capacities building need « sustainable » scientists, broad vision politicians, and overall a social control

Thank you for your attention ...