Some thoughts on strategies how to benefit from CERN (as full member)

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Disclaimer

This talk reflects 100% of my personal thoughts and opinions. I would be very pleased to obtain feedback…

Serbia is a visible member of the ATLAS Family

Benefits of CERN

- Scientific
  - Goes without saying that the most important
  - Key reason to be at CERN
  - Will not focus on them today, because there are others, too
- Education
- Technology (transfer), R&D
- Supply contracts
- Visibility, image (outreach)

Education

- CERN has a wide range of education programs (summer student, technical student, doctoral student, fellows...)
- But effort is required also at the home front
  - Links to other departments (engineering, computing)
  - HEP laboratory facilities available as part of student curriculum?
  - Special summer student programs paid by the institute?

Technology (transfer), R&D

- There is a lot of on-going technology development efforts at CERN...
  - Accelerators (SLHC, CLIC...)
  - Detectors (high-lumi, CLIC...)
  - Technical infrastructure etc.
- ... But it requires some effort to turn it for other use outside HEP
- In fact, needs a real “hands on” approach to be part of it (and to benefit from it); very hard for outside firms to jump in unassisted
- Usually, linked with longer-term R&D efforts in the field (prototypes, feasibility studies etc., small in financial scale)
- Requires active (scientific) participation from an institute and should thus be an integral part of its scientific activities

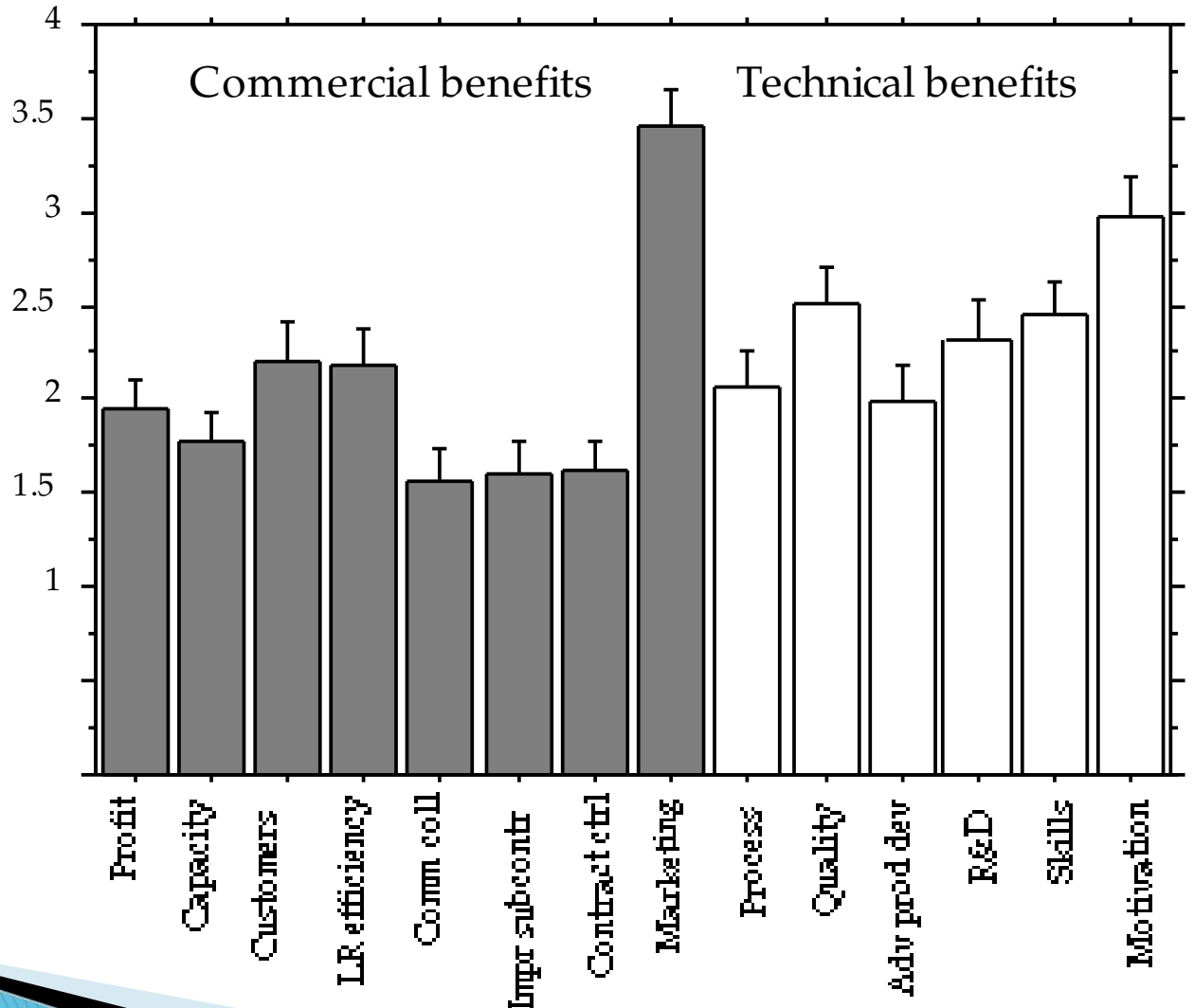
Supply contracts

- The purchasing budget of CERN for supplies ranges annually between 300 and 500 MCHF, depending on the phase of its major projects
  - As the LHC is now completed for the initial runs, the purchasing volume is also down
- Rough breakdown of supply contracts per category
  - Civil engineering < 10%
  - Electrical engineering < 30%
  - Electronics ~ 5%
  - Computers ~ 5%
  - Mechanical supports, structures < 15%
  - Vacuum, low-T technologies < 30%
  - Detectors, other < 5%
- Industry base in Serbia for CERN needs
  - Transport, cars, defense
  - Suggest areas such as large-size mechanical supports, hydraulic devices, electronics, sensors, power supplies, control software…

Supply contracts (2)

- According to the CERN purchasing rules, the lowest bidder that fulfils the technical specification and delivery schedule, wins the contract
  - There are some caveats but let’s ignore them here
- Contacts with CERN (engineers) are crucial!
- Suppliers seldom unknown for larger contracts (> 100 kCHF)
- Requires active lobbying at CERN and scanning of local (small) firms at home
- Best supplier benefit strategy depends also on the nature of the supply products...

Supply contracts (3)



Supply contracts (4)

Metal-ceramic feedthroughs	Beam separators
Thyristor-controlled reactors	Multi-core transmission cables
High-voltage feedthroughs	Superconducting magnets (2)
Detector electrodes	Electrical heating jackets
RF storage cavities	RF electronics (2)
Intercavity vacuum chambers	Vacuum chambers
Cryogenics plant	Access cards
Vacuum tubes	Feedthrough rings for detectors
Automated cartridge storage	Ultra-high vacuum flanges
	Mechanical detector structure
	Emergency diesel generator sets
	Power cables
Power transformers (2)	Superconducting cable
Power cables (2)	Power cables
Power supplies	Bolts, nuts for vacuum systems
Bellows and assemblies	Off-line computers
Mechanical racks	Busbars
Radio telephone system	Collimators
Temperature controllers	Electronics for power converters
Thyratrons	Wiggler-magnets
VME-electronics	AV-communications equipment
Digital exchange system	Gaskets for vacuum system
	Capacitor banks
	Power transformers
	Low-voltage switchgear
	Diodes

Level of supplier familiarity

Level of CERN input

Supply contracts (5)

- There are two main supplier strategies;
  - “Just sell” standard supplies and make small-margin profit, or
  - Go for the high-end, learn, use it for other things
- So it is worth while looking at the company strategies, too
- Assuming Serbia’s full MS fee ~ 3 MCHF/y, annual target for a balance share of contracts < 1 MCHF
  - That requires systematic work

Visibility, image (outreach)

- Continuing strong support for physics research requires strong visibility and good image back
- It is a long term, strategic issue that should not be forgotten when the “job gets done”
- Politicians, senior civil servants
- Public
- Media
  - Articles
  - Information updates
  - Local events
- Use of CERN material (press releases, outreach, news, etc.)
- Workshops (scientific, technical)
  - Explore EU funding?

What did Finland do?

- Organize funding directly to the HEP (coordinating) institute
- Create a separate organization for handling the CERN contracts
  - Integrate it within the institute activities, close to physics, but as part of technology program
  - Establish a permanent base for it at CERN
- Tap into domestic R&D funding to develop future technologies
- Create strong educational programme for students, also for other fields (engineering)

Couple of things to remember

- Paying the CERN MS fee is not enough
- Roughly, the same amount is needed at home, too!
  - Need to build infrastructure both towards CERN and local instances
  - Rule of thumb: cost of person = material cost
- Don’t be shy, ask now (it’s always harder to ask & get it later)
- Ask CERN to help to boost the status and activities in Serbia during the transition period

Conclusions

- Serbia is a visible and fully contributing member in ATLAS
- It has a lot more to offer the HEP community and CERN
- Reaping the full benefits of CERN will require a pro-active strategy in
  - Physics (already in action)
  - Education
  - Technology, R&D
  - Supply contracts
  - Visibility, image back at home