Innovative Public/Private Collaborations Shaping Present and Future ICSC Impact

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Spoke 3, 8/5/2024

Finanziato
dall'Unione europea
NextGenerationEU

Ministero
dell'Università
e della Ricerca

Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

ICSC
Centro Nazionale di Ricerca in HPC,
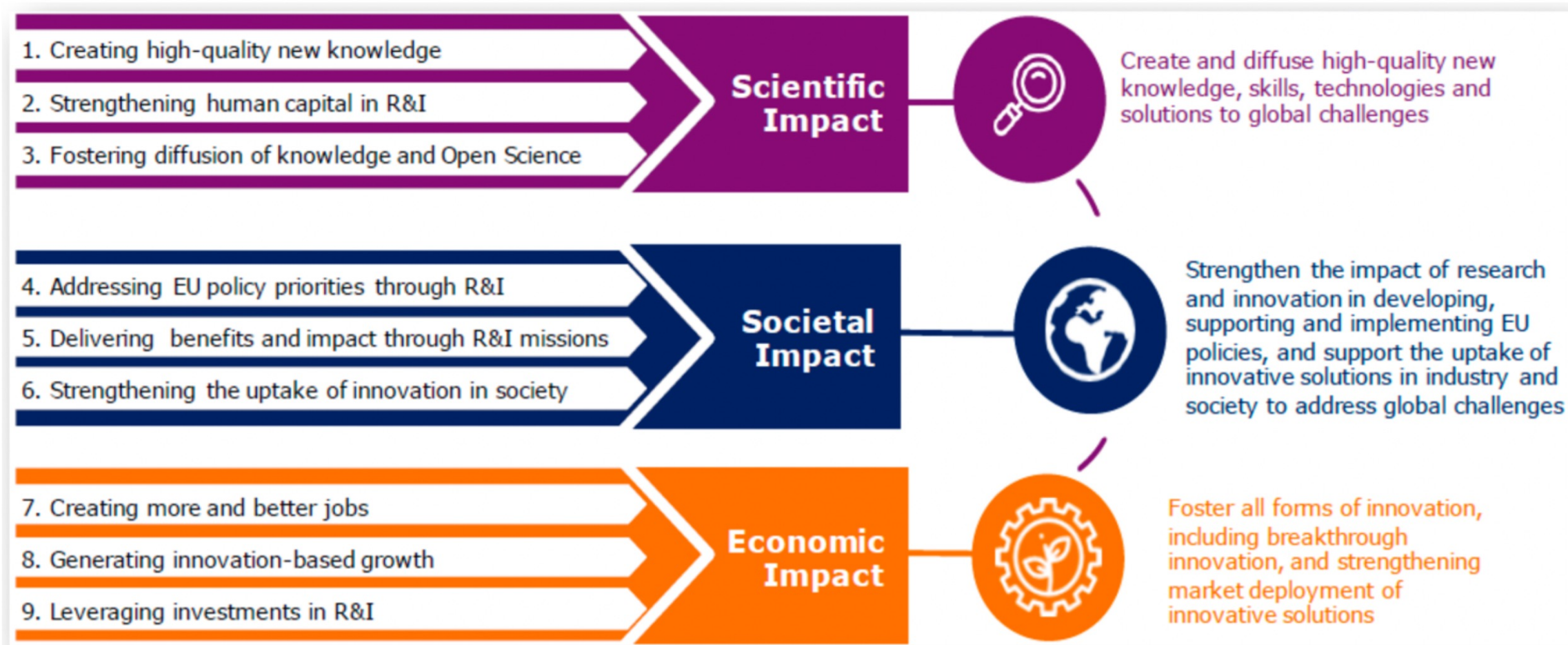Big Data and Quantum Computing

«Impact» in the original ICSC proposal

- ■ Centered around 3 pillars:
  1. The "Key Enabling Technologies" (KET) identified by the Italian NRRP
     - Examples: Advanced simulation, analysis and big data management; climate, environment and disaster protection; quantum technologies; …
  2. The "Key Exploitable Results" (KER), defined to serve as the general ICSC impact blueprint
     - Examples: An integrated HPC, Quantum and Big Data Platform; Consultancy, technology transfer and training courses for effective exploitation of scientific applications; Dynamic co-creation of results through Open Calls; …
  3. A set of Expect Impacts and the associated Key Performance Indicators (KPI), which concretely implement the KERs

- ■ … classified around a few "impact dimensions"

1. Creating high-quality new knowledge
2. Strengthening human capital in R&I
3. Fostering diffusion of knowledge and Open Science

Scientific Impact

Create and diffuse high-quality new knowledge, skills, technologies and solutions to global challenges

4. Addressing EU policy priorities through R&I
5. Delivering benefits and impact through R&I missions
6. Strengthening the uptake of innovation in society

Societal Impact

Strengthen the impact of research and innovation in developing, supporting and implementing EU policies, and support the uptake of innovative solutions in industry and society to address global challenges

7. Creating more and better jobs
8. Generating innovation-based growth
9. Leveraging investments in R&I

Economic Impact

Foster all forms of innovation, including breakthrough innovation, and strengthening market deployment of innovative solutions

(Source: European Commission)

Public/Private Collaborations and Impact

- All 3 impact dimensions are involved and must therefore be considered:
  - Scientific, Societal, Economic

- Let's reflect specifically about <u>one of the ICSC key impact motifs</u> (think about this within the Spoke 3 context, but also with post-NRRP scenarios in mind):

"**Unlocking the innovation potential of research infrastructures**", through
  - Attraction of users
  - Tailored access mode for industry (particularly SMEs)
  - Dedicated training
  - Data exploitation support
  - Generation of value from research data through open science / open data
  - International outreach

Innovation Funds Projects[†]

- The "Innovation Funds Projects" are meant to address some of the impact considerations mentioned so far
  - Not pre-determined at the ICSC submission time
  - Reserved to ICSC affiliates (vs. the open calls)
  - Led by one of the ICSC private partner, with the optional participation of other ICSC private or public partners

- 75 projects were approved in 3 innovation funds calls. Public details are available at https://igdb.supercomputing-icsc.cloud/
  - Overall cost: about 30.9M€ (~25.7M€ subsidy from the PNRR, the rest is co-funded by private partners)

[†]Terminology: please call them "Innovation Funds", not "Innovation *Grants*"

Partner	Type	Spoke 0	Spoke 1	Spoke 2	Spoke 3	Spoke 4	Spoke 5	Spoke 6	Spoke 7	Spoke 8	Spoke 9	Spoke 10	Hub
Autostrade	Private	Participant	-	-	-	-	-	Participant	-	-	-	Participant	-
CMCC	Public	-	-	-	-	Leader	-	-	-	-	-	-	-
CNR	Public	-	-	-	Co-leader	Participant	Participant	Leader	Participant	-	Participant	-	-
CRS4	Public	-	-	-	-	-	-	-	-	Participant	-	Participant	-
Cineca	Public	Leader	Participant	-	-	-	-	-	-	-	-	Participant	-
ENEA	Public	-	Participant	-	-	Participant	Participant	-	Participant	-	-	-	-
ENI	Private	Participant	Participant	Participant	-	-	-	Participant	Participant	-	-	Participant	-
Engineering	Private	Participant	-	-	-	-	-	Participant	-	Participant	-	Participant	-
FBK	Public	-	-	-	-	Participant	-	-	-	Participant	Co-leader	-	-
Ferrovie dello Stato	Private	-	-	-	-	-	-	Participant	-	-	-	-	-
Fincantieri	Private	-	Participant	-	-	-	-	Participant	-	-	Participant	Participant	-
Fondazione Innovazione Urbana	Private	-	-	-	-	-	-	-	-	-	Participant	-	-
GARR	Public	Participant	-	-	-	-	-	-	-	-	-	-	-
Humanitas	Private	-	-	-	-	-	-	-	-	Participant	-	-	-
IFAB	Private	Participant	Participant	Participant	-	Participant	-	Participant	Participant	Participant	Participant	Participant	-
IIT	Public	-	Participant	-	-	-	-	-	-	Leader	-	Participant	-
INAF	Public	-	Participant	Co-leader	Leader	-	-	-	-	-	-	Participant	-
INFN	Public	Co-leader	-	Leader	Co-leader	-	-	-	-	Participant	-	Participant	-
INGV	Public	-	-	-	-	Participant	-	-	-	-	-	-	-
Intesa San Paolo	Private	-	Participant	Participant	Participant	-	-	-	-	-	Participant	Participant	-
Leonardo	Private	Participant	Participant	Participant	Participant	-	-	Participant	Participant	-	Participant	Participant	-
OGS	Public	-	-	-	-	-	-	-	-	-	-	-	Participant
Politecnico di Bari	Public	-	-	-	-	-	Participant	-	-	-	-	-	-
Politecnico di Milano	Public	-	Participant	-	-	-	-	Participant	-	-	-	Leader	-
Politecnico di Torino	Public	-	Participant	-	-	-	-	Participant	Participant	-	-	-	-
SISSA	Public	-	-	-	Participant	-	-	-	Co-leader	-	-	-	-
SNS	Public	-	-	-	Participant	-	-	-	-	-	-	-	-
Sapienza	Public	-	-	Participant	-	-	Participant	Leader	-	-	-	Participant	-
Sogei	Private	Participant	Participant	Participant	Participant	Participant	Participant	-	-	-	Participant	Participant	-
Terna	Private	Participant	-	-	-	Participant	-	Participant	-	-	-	-	-
Thales Alenia Space Italia	Private	-	Participant	Participant	Participant	-	-	Participant	-	-	Participant	Participant	-
Unipol	Private	Participant	Participant	Participant	Participant	Participant	-	-	-	-	-	Participant	-
Università Milano-Bicocca	Public	-	-	Participant	-	-	-	-	-	-	Participant	Participant	-
Università Roma Tor Vergata	Public	-	Participant	-	Participant	-	-	Participant	-	-	-	-	-
Università del Salento	Public	-	-	Participant	-	Participant	-	-	-	-	Participant	-	-
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Università di Firenze	Public	-	-	-	-	-	Participant	Participant	Participant	-	-	-	-
Università di Modena e Reggio Emilia	Public	-	-	-	-	-	-	-	-	-	-	-	Participant
Università di Napoli	Public	-	Participant	Participant	-	-	-	-	-	Leader	Participant	-	-
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Università di Parma	Public	-	-	-	-	-	-	-	-	-	-	-	Participant
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Università di Trieste	Public	-	-	Participant	Participant	-	-	-	Participant	-	-	-	-

Budget table (Coordinator / Main Spoke highlighted):

All projects, all partners, spoke 3

Progetto_breve	Costo	Costo_Sud	Agevolazione	Agevolazione_Sud	% Agevolazione_Sud	Call
ATS	94,012.50	94,012.50	94,012.50	94,012.50	100.00	2
FD	123,832.00	47,541.00	108,255.25	47,541.00	43.92	1
HAEQ	188,750.00	183,000.00	185,875.00	183,000.00	98.45	3
HAMMON	567,781.15	290,733.08	552,854.15	290,733.08	52.59	1
IDL	278,076.20	0.00	211,826.20	0.00	0.00	1
IGUC	155,438.40	0.00	130,438.40	0.00	0.00	3
SCP	104,397.00	0.00	91,747.00	0.00	0.00	1
TS	188,556.30	86,641.00	179,717.40	86,641.00	48.21	1
Total	1,700,843.55	701,927.58	1,554,725.90	701,927.58	45.15	

File name: budget.html   [Download the budget table]

Projects list:

ATS - Anomalies in time series

Innovation Fund call: 2
Main Spoke: 3
Participating spokes: 3
Coordinator: Intesa San Paolo
Contacts: riccardo.crupi@intesasanpaolo.com
Project partners (Spoke 3 only):
  INAF
  INFN
  Intesa San Paolo

FD - Fraud Detection

Innovation Fund call: 1
Main Spoke: 10
Participating spokes: 3
Coordinator: Intesa San Paolo
Contacts: davide.corbelletto@intesasanpaolo.com
Project partners (Spoke 3 only):

Mapping between ICSC Partners and Spokes
(Private partners highlighted)

Partner	Type	Spoke 0	Spoke 1	Spoke 2	Spoke 3	Spoke 4	Spoke 5	Spoke 6	Spoke 7	Spoke 8	Spoke 9	Spoke 10	Hub
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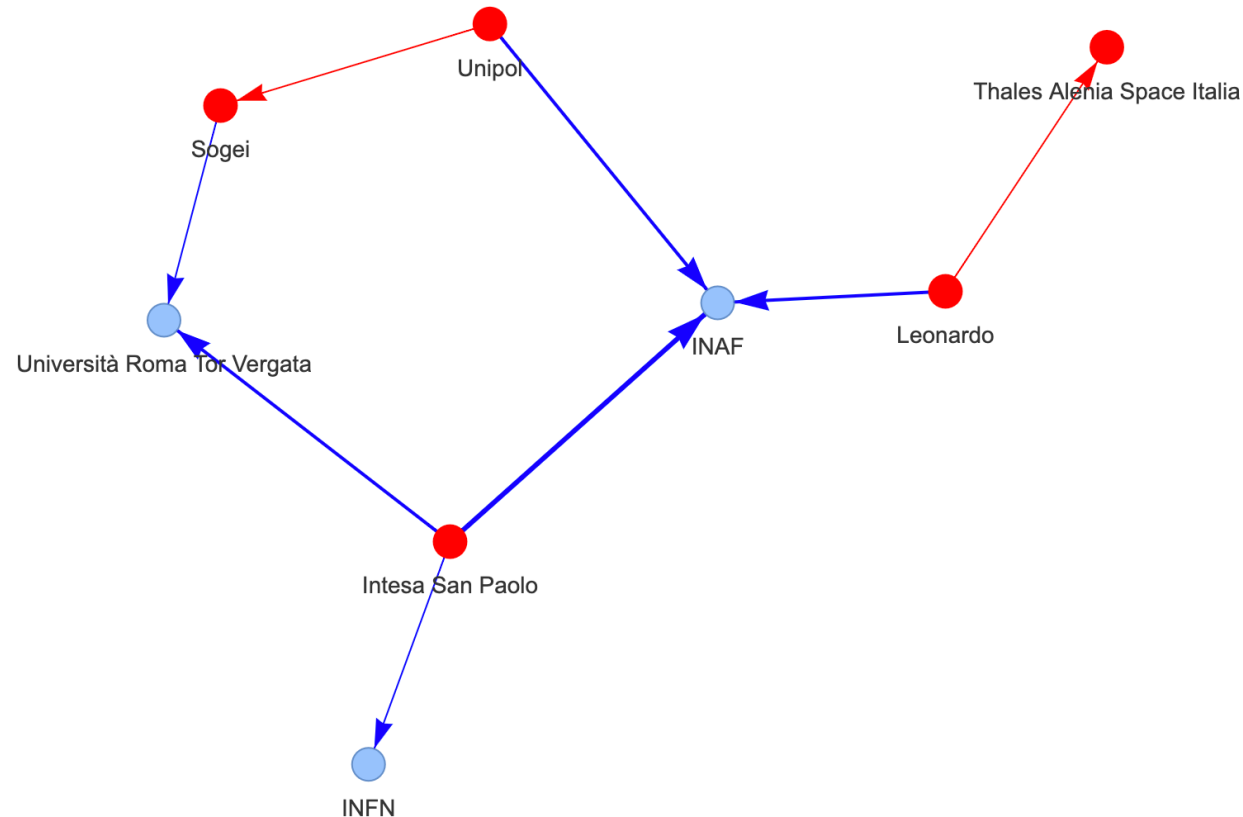File name: budget.html [Download the budget table]

All projects, all partners, all spokes

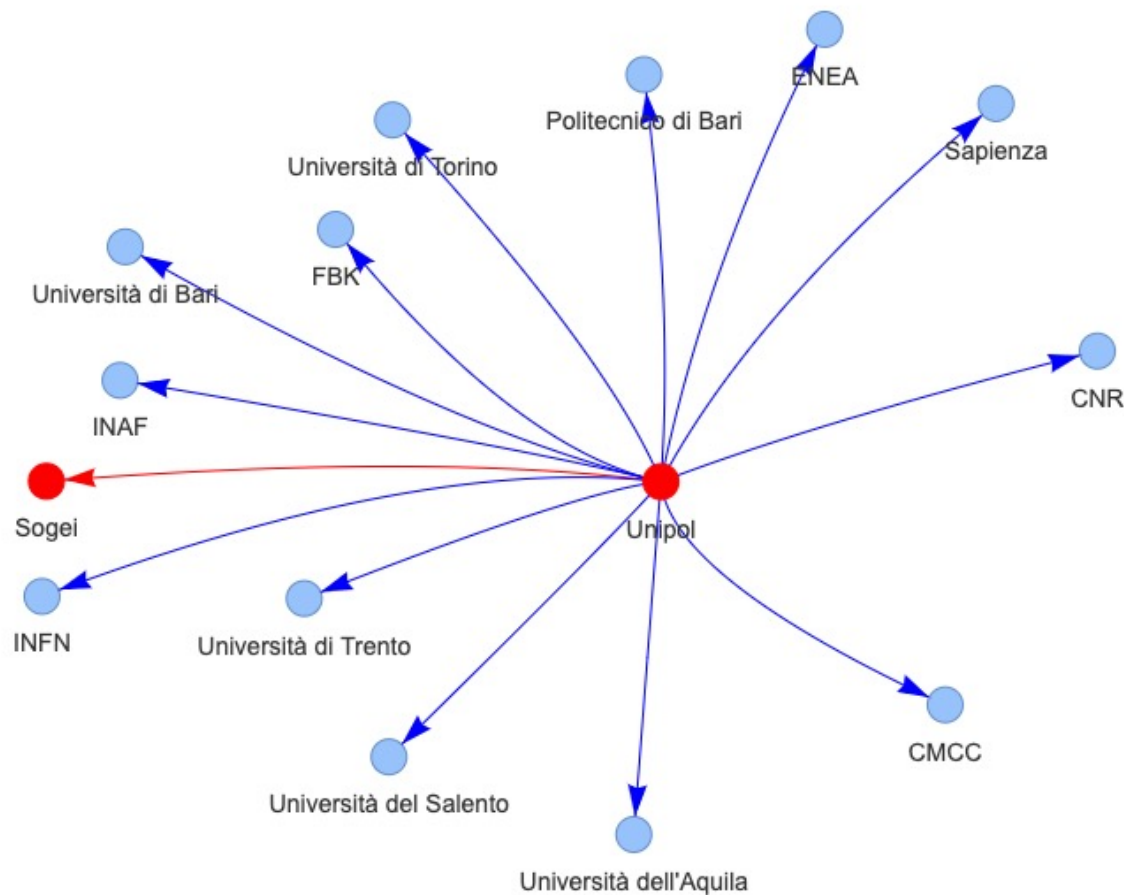| Spoke_costo	Costo	Costo_Sud	Agevolazione	Agevolazione_Sud	% Agevolazione_Sud
0	2,573,257.78	794,875.00	1,708,681.96	514,125.00	30.09
1	1,951,207.35	673,871.80	1,695,964.58	531,534.30	31.34
10	2,595,105.40	122,450.00	1,972,480.68	84,931.25	4.31
2	2,488,884.85	1,010,142.00	2,344,276.05	1,010,142.00	43.09
3	1,700,843.55	701,927.58	1,554,725.90	701,927.58	45.15
4	1,241,469.67	336,013.75	1,169,054.17	336,013.75	28.74
5	1,116,959.10	738,967.90	1,077,491.10	738,967.90	68.58
6	4,230,025.50	268,093.75	3,282,088.00	155,393.75	4.73
7	2,686,313.66	548,594.12	2,637,688.66	548,594.12	20.80
8	4,916,977.50	1,036,490.00	3,162,980.59	572,465.00	18.10
9	5,378,061.55	2,755,154.30	5,071,181.17	2,755,154.30	54.33
Total	30,879,105.91	8,986,580.20	25,676,612.87	7,949,248.95	30.96

Spoke 3 Innovation Funds Connections

Innovation Funds Connections: Spoke 3

Finanziato
dall'Unione europea
NextGenerationEU

Ministero
dell'Università
e della Ricerca

Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

ICSC
Centro Nazionale di Ricerca in HPC,
Big Data and Quantum Computing

Project-Specific Connections

Innovation Funds Connections: Project HAMMON

Overall Innovation Funds Connections

Innovation Funds Connections: All partners

What do we make of all this, looking forward?

*We believe that, clearly considering also necessary improvements in what is a "first" at these scales, the Innovation Funds experience and specifically the **Public/Private partnerships** that are thus being established, is overall very positive and must be followed up at all levels (strategic and technical), now and in the post-NRRP timeframe*

"**Unlocking the innovation potential of research infrastructures**", through

- Attraction of users
- Tailored access mode for industry (particularly SMEs)
- Dedicated training
- Data exploitation support
- Generation of value from research data through open science / open data
- International outreach

Improve/Expand the RAC, Connection to other communities

Bespoke product portfolio, Start-up / SME support

Novel training opportunities

Ethics, IP, creation of an ICSC quality data repository (HAMMON is a first example)

Participation to EU and international initiatives; connection to other national projects (not necessarily only linked to the NRRP)

Data Management Plans, (but also e.g. Open AI Factories)

The RAC

- **Already mentioned (and hammered…) by Ugo**
  - So far: 33 projects (flagships or innovation funds) already got their resources allocated, in some cases with reductions vs. the original requests
    - "In-kind" resources still available for ICSC: about ¾ of Leonardo Booster, ½ of Leonardo DCGP, ¼ of INFN Cloud, ½ of INFN Grid. No big issues so far with storage on disk (@ CINECA or @ INFN) or on tape (@ INFN only)
  - Evaluations ongoing for requests submitted between Jan and Mar 2024

- **Where we are going:**
  - Stick to a 3-months allocation cycle as much as possible
  - Define an integrated ICSC Portfolio (vs. the current CINECA + INFN offering)
  - Eagerly waiting for new resources to be made available, esp. Lisa, QC (@CINECA) and the HPC Bubbles (@INFN)

Support for Start-ups / Small Innovative Companies

- The ICSC Board of Directors has recently approved an experimental trial to support start-ups and small innovative companies
  - Covered by the Hub with funds *not* accountable via the NRRP

- Key scenarios (can be combined):
  "I have an innovative idea in the area of […] and I would like ICSC support for:"
  1. ICSC resources or services
  2. [A small amount of] money
  3. Finding and possibly hiring manpower/support for my project

- How and when:
  - We plan to open a web-based submission portal dedicated to this initiative by the end of May 2024 and validate/assign requests before Summer 2024
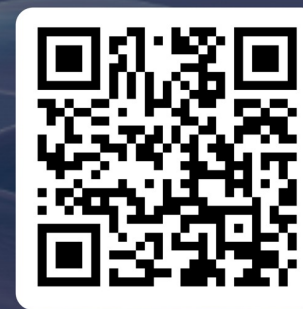
This anonymous survey consists of 4 sections:

1. Data management and resources
2. Training and recruitment
3. New or improved services
4. Collaborations and AOB

Please answer through your mobile or laptop:

https://forms.office.com/e/597iyg9FJr

ICSC Spoke 3 May 2024 Survey

Survey time!

Recap

- As already mentioned by Alessia on the first day of this meeting, the current Hub/Spoke ICSC structure is not carved in stone

- We are considering several impact-related options for the post-NRRP era, with a focus on the unique ICSC value added points. Among them:
  - A state-of-the-art HPC/Cloud infrastructure & service portfolio
  - An extensive and unparalleled expertise coming from academia, research institutions, industry
  - Very promising key results from all Spokes
  - Early experience with public/private partnerships with Innovation Fund projects and Open Calls
  - Built-in support for multiple impact dimensions

Thank you all for continuing to make ICSC a success!