

FTI Group Meeting

December 2024

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Welcome to the FTI Group

- This is the first Group Meeting of FTI
 - ... an opportunity to explain what the Group is about
 - ... the ambitions, mandate, objectives, expected results
 - ... and meet each other
- Group meetings don't have to be boring!!
 - ... how do we make them...
 - Useful
 - Informative
 - Fun!!
- Ideas, suggestions, proposals are welcome, this is not about me, it's about everybody

Let's start from...

- What the hell does FTI means??
- It stands for **Frontier Technologies and Initiatives**
- Well... It's even less clear than before...
- Fine, let me ask the source of all true knowledge...

ChatGPT, what does “Frontier Technologies” mean?

"Frontier technologies" refer to cutting-edge, innovative technologies that are at the forefront of scientific and technological advancement. These are typically emerging or breakthrough technologies that have the potential to disrupt industries, solve complex global challenges, or transform how people live and work.

They are often in early stages of development or adoption but hold significant promise for the future. Some examples of frontier technologies include:

Artificial Intelligence (AI) and Machine Learning

Quantum Computing

Big Data

Metaverse and Digital Twins

Next-Generation Connectivity

...

Now it's clear, thanks!

But why Communications and Education?

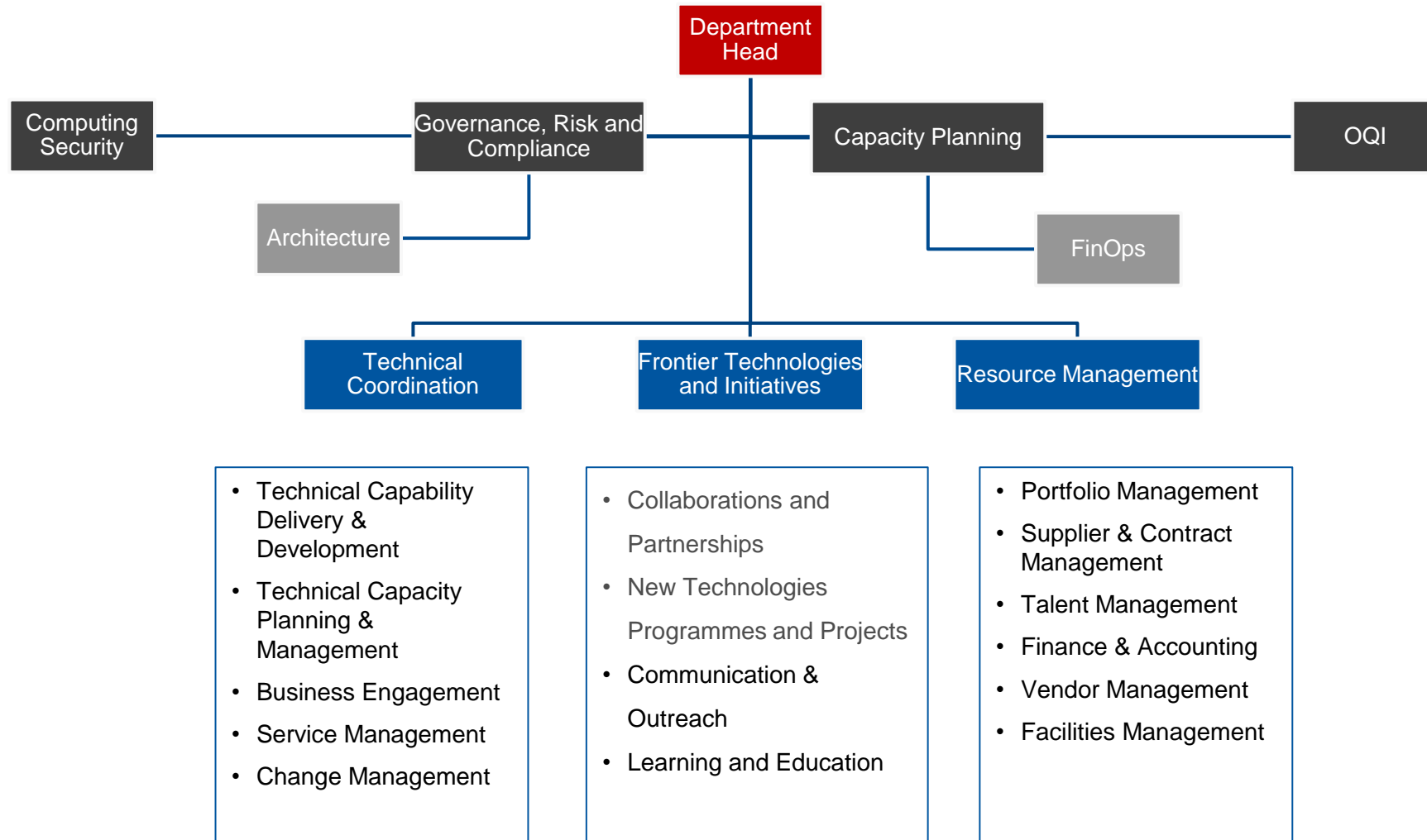
Well, innovation and frontier technologies strongly rely on explaining, showing, educating, training, connecting, participating, co-developing, etc. etc.

Understanding how to talk to people of all ages and backgrounds and designing new ways of doing so is also part of living on the frontier

But there is much more, so let's dive into some more details

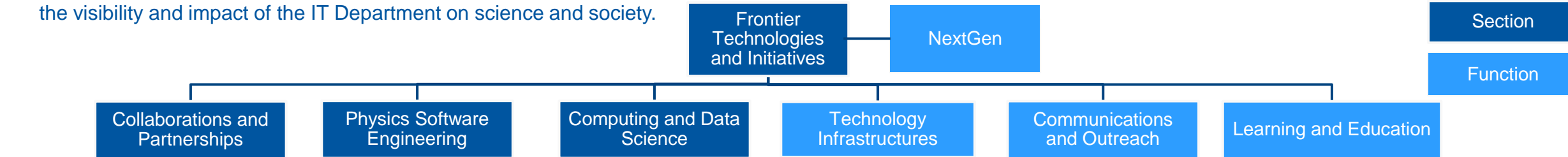
Organisational structure

A high-level organigram provides a simplified view of where key capabilities will sit across the department in the future state. The structure has also been designed to increase collaboration across IT, enabling innovation to flourish in-line with the IT Strategy.



Frontier Technologies and Initiatives: Functional overview

The Frontier Technologies Initiatives Group (IT-FT) is responsible to identify, support and where appropriate execute joint development projects on frontier technologies in collaboration with the IT Technical Delivery experts, the CERN community, other scientific communities and industry. It is also responsible to oversee the communication, outreach and education activities to support the execution of the IT strategy, develop skills in emerging technologies, and maximise the visibility and impact of the IT Department on science and society.



KEY ROLES & RESPONSIBILITIES

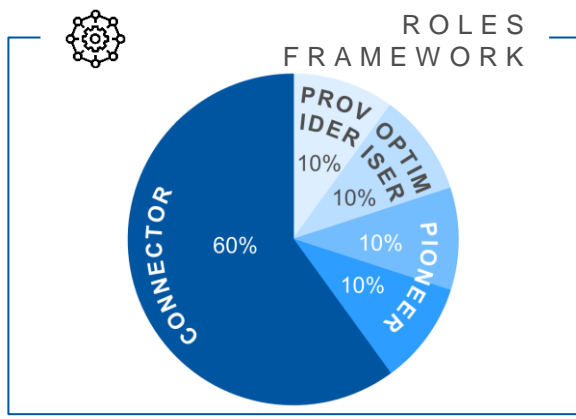
- Promote, define, and support the establishment of collaborations and partnerships with the scientific communities, industry and other international organisations
- Support the CERN and HEP community in the assessment of new technologies like AI, HPC and Quantum, and the development of efficient, sustainable physics computing applications
- Oversee the development and execution of the IT communication strategy, ensuring alignment to CERN's overall mission and objectives and maximisation of impact
- Define, oversee and execute education and skills development programmes and initiatives

MEASURES OF SUCCESS

- Increased intra- and inter-departmental collaboration on new technologies development
- Improved efficiency and transparency of joint activities and their impact
- Improved clarity on the role of IT Department in the CERN innovation objectives
- Increased engagement across CERN as a result of effective socialisation of objectives
- Increased visibility and impact of IT Department as a result of effective communications
- Increased impact and reach of education and skills development within and outside the CERN community

KEY CAPABILITIES

Technology Assessment	Collaboration
Innovation	Education and Outreach
Communication	Impact on society



GOVERNANCE STRUCTURES

- Quarterly Group meetings
- Bi-weekly Section Leaders meeting
- Weekly one-to-one meetings with Section/Function leads
- Attendance by representation at IRB, ITSC, STDF and other bodies as required

PAIN POINTS ADDRESSED

- Communicating the role CERN IT plays in fostering a culture of continuous improvement and cutting-edge solutions more clearly
- Provide better alignment of partnerships, communication, and education with the IT Dep. strategic objectives

Collaborations and Partnerships: Functional overview

The Collaborations and Partnership section fosters strategic alliances to drive technical innovation and support CERN's mission. The section is responsible for promoting and developing collaborations with scientific communities, the HPC community, industry leaders, European initiatives, and other international organizations. By engaging with key internal and external stakeholders, the section advances the co-development of technologies and techniques for the benefit of the IT Department, CERN experiments and CERN activities at large.

Frontier Technologies and Initiatives

Collaborations and Partnerships

Physics Software Engineering

Computing and Data Science

Technology Infrastructures

Communications and Outreach

Learning and Education

KEY ROLES & RESPONSIBILITIES

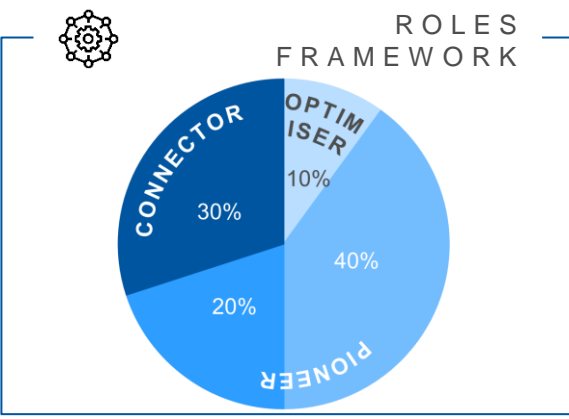
- Promote and support collaborations by facilitating the establishment and growth of partnerships with scientific and technical communities, industry leaders, infrastructures providers, international organizations, ensuring alignment with CERN's strategic objectives.
- Develop and strengthen relationships with EuroHPC-JU and national HPC providers, participate in HPC user and access fora and publicize and coordinate HPC access opportunities..
- Drive technical innovation by initiating and executing joint projects with industry, research communities and infrastructure providers (i.e. HPC) to position CERN at the forefront of scientific and technological advancements.
- Engage with external stakeholders such as the European Commission, the CERN computing community, and other stakeholders to develop and execute programmes that attract external support, drive innovation, and foster CERN's mission.
- Foster international collaboration by identifying and developing opportunities for international collaboration across diverse scientific domains, fostering a global network of partnerships that contribute to CERN's long-term vision.

MEASURES OF SUCCESS

- Engage new industries and strategic partners: successfully attract new industry and research partners for exploratory and strategic projects, expanding CERN's collaborative network.
- Revitalize existing projects: refresh and sustain existing collaborative projects, maintaining a focus on cutting-edge innovation and ensuring continued relevance and impact.
- Enhance dissemination activities (scientific publications, annual reports, presentations at conferences, strategy documents) to promote joint activities, while increasing participation in external opportunities.
- Increase project visibility: elevate the visibility and recognition of CERN's collaborative projects, showcasing their contribution to advancing CERN's mission and their broader impact on the scientific community.

KEY CAPABILITIES

Technology Assessment and R&D	Collaboration
Knowledge Sharing	Partnership Management
Innovation	



GOVERNANCE STRUCTURES

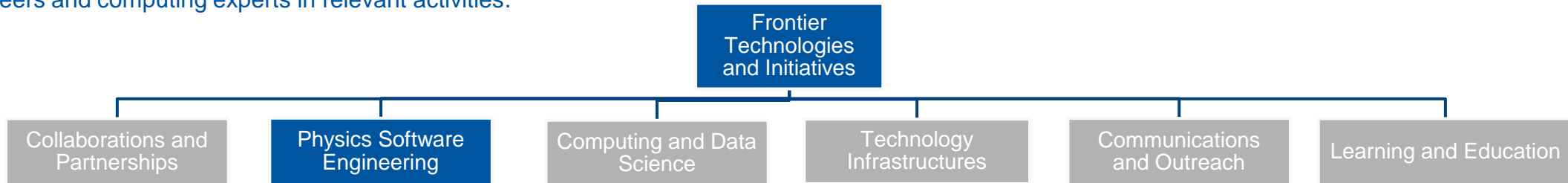
- Bi-monthly Section leaders meetings
- Weekly section meetings to assess technical progress, status and plans
- Regular meetings as required by projects and collaborations (Internal and external technical meetings, CERN openlab partnerships, EC office, PMO, KT)

PAIN POINTS ADDRESSED

- Provide better alignment of partnerships, communication, and education with the IT Dep. strategic objectives

Physics Software Engineering: Functional overview

The Physics Software Engineering Section works on novel software engineering concepts and computing hardware performance aspects of commonly used algorithmic data processing applications in high energy physics (HEP) and provides support and opportunities for skills development and visibility of software engineers and computing experts in relevant activities.



KEY ROLES & RESPONSIBILITIES

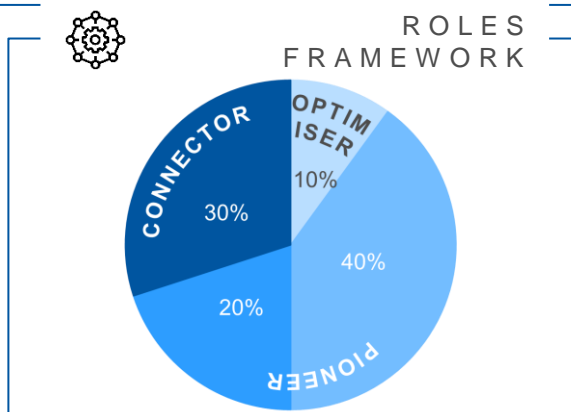
- Improve the performance of software applications commonly used in the HEP community by adopting new computing hardware architectures and engineering techniques
- Investigate and evaluate innovative computing architectures and software engineering concepts for their usability in the domain of physics data processing
- Measure and enhance the sustainability of HEP software at the level of the individual application on current and future heterogeneous computing architectures
- Boost the career paths of research software engineers and scientists via specialised training and recognition of their work in the field

MEASURES OF SUCCESS

- Adoption of software packages within the HEP community, in particular the LHC experiments and their usage on novel computing hardware platforms
- Improvements in data processing challenges of forthcoming data taking periods based on solutions provided by the Section
- Increased adoption of novel software engineering techniques, tools and platforms within the physics software engineering community
- Improved skills development, especially students and early career researchers, training resources and recognition mechanisms

KEY CAPABILITIES

Technology Assessment	Collaboration
Innovation	Training and Recognition
Impact on physics data processing	



GOVERNANCE STRUCTURES

- Bi-weekly Section leaders meetings
- Weekly section meetings to assess status and plans
- Regular meetings with projects and collaborations (CERN EP + TH, NGT, LHC MC WG, MCNet, HSF, ICFA, JENA, EIROforum, EVERSE, SYCLOPS, ...)

PAIN POINTS ADDRESSED

- Communicating the role CERN IT plays in fostering a culture of continuous improvement and cutting-edge solutions more clearly
- Improve integration and exchanges across the RCS sector on software engineering and code development for physics

Computing and Data Science: Functional overview

The Computing and Data Science Section will study the impact of cutting-edge technologies like Quantum Computing and Artificial Intelligence on the development of future computing models for fundamental scientific research by developing proof of concepts and co-development activities with IT Dep. experts, CERN and experiments experts, and researchers in industry and other relevant scientific communities.

Frontier Technologies and Initiatives



KEY ROLES & RESPONSIBILITIES

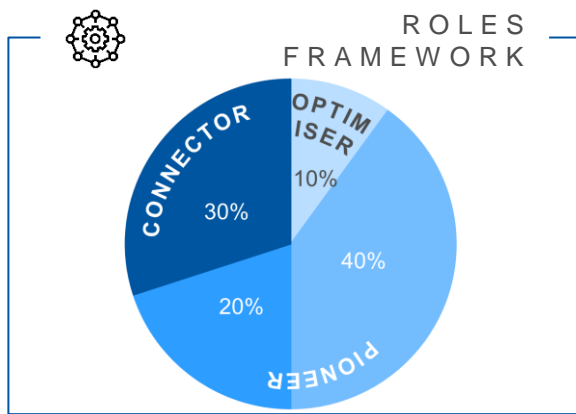
- Work closely with IT Department experts and the CERN and experiments community to identify areas of interests to introduce or expand the use of emerging technologies, such as AI and Quantum
- Design, develop, test, and assess technology proofs of concept in real-world scenarios
- Design and execute joint research projects with academia, industry, and international research organizations within and beyond HEP
- Contribute to Education, Communication and the further development of technical competences maximising the impact of the activities on CERN and society

MEASURES OF SUCCESS

- Number and impact on CERN activities of new prototypes and demonstrators showcasing new technology on realistic use case
- Number quality of scientific publications
- Increased impact of education and skills development in IT, CERN and beyond through support for internships and student projects (Master, PhD)

KEY CAPABILITIES

Technology R&D	Proof of Concept
Innovation	Collaboration



GOVERNANCE STRUCTURES

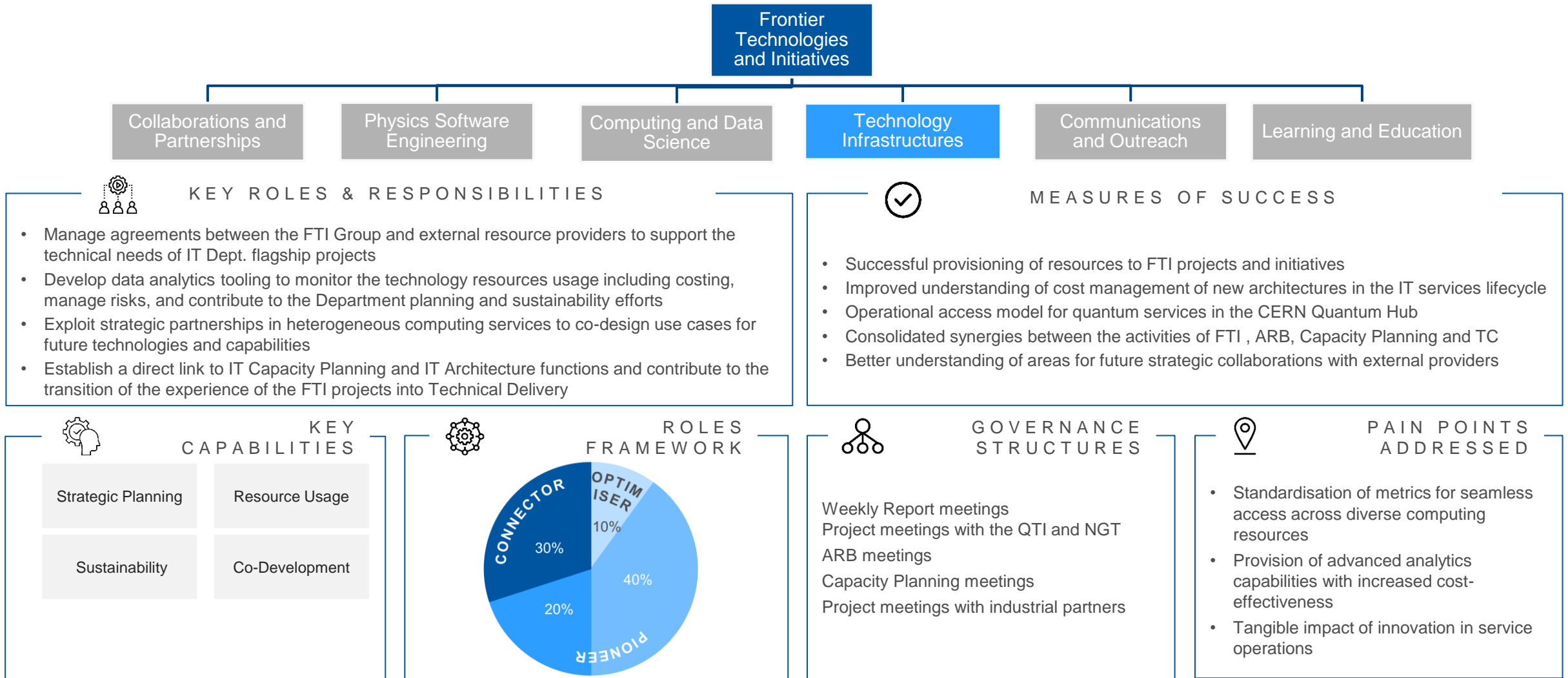
- Bi-monthly Section leaders meetings
- Weekly Section meetings
- Weekly journal club (dedicated to new tech scouting and knowledge sharing)
- Project meetings as necessary

PAIN POINTS ADDRESSED

- Communicating the role CERN IT plays in fostering a culture of continuous improvement and cutting-edge solutions more clearly
- Improve integration and exchanges among teams working on different techs (i.e. HPC, QC, AI, ...) across IT Dep. and the Organization

Technology Infrastructures: Functional overview

The Technology Infrastructures function provides general coordination of access to resources and capabilities from external providers to FTI activities. It also develops expertise in efficient and sustainable management and use of heterogenous computing services such as public clouds, quantum services and HPC, keeping close integration with the IT Architecture function and a direct relationship with IT Capacity Planning and the Technical Coordination teams.



Communications and Outreach: Functional overview

The Communications and Outreach team is responsible to define and implement the IT Department Communications and Outreach strategy in close collaboration with the Department Management and technical experts to maximise the visibility and awareness of the IT Department objectives, activities, and competences across a diverse range of audiences through appropriate channels, and support its impact on the advancement of science and society

Frontier Technologies and Initiatives



KEY ROLES & RESPONSIBILITIES

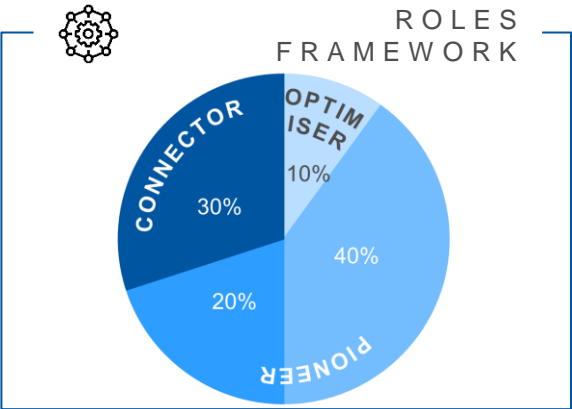
- Oversee all internal and external IT communications, ensuring its messaging is consistent and engaging
- Promote the IT Department's mission in supporting the CERN research programmes and open science
- Create communications initiatives to foster motivation, engagement, and attractiveness
- Prepare detailed reports, press releases, and other materials as necessary

MEASURES OF SUCCESS

- Increased number of readers of published articles
- Increased number of profiles following the social media (positive growing trend)
- Improved number and sentiment of the impressions and reactions to posts
- Attract spontaneous feedback, improved number and sentiment of reactions to published articles

KEY CAPABILITIES

- Strategic planning
- Audience analysis
- Storytelling
- Internal culture sensitivity



GOVERNANCE STRUCTURES

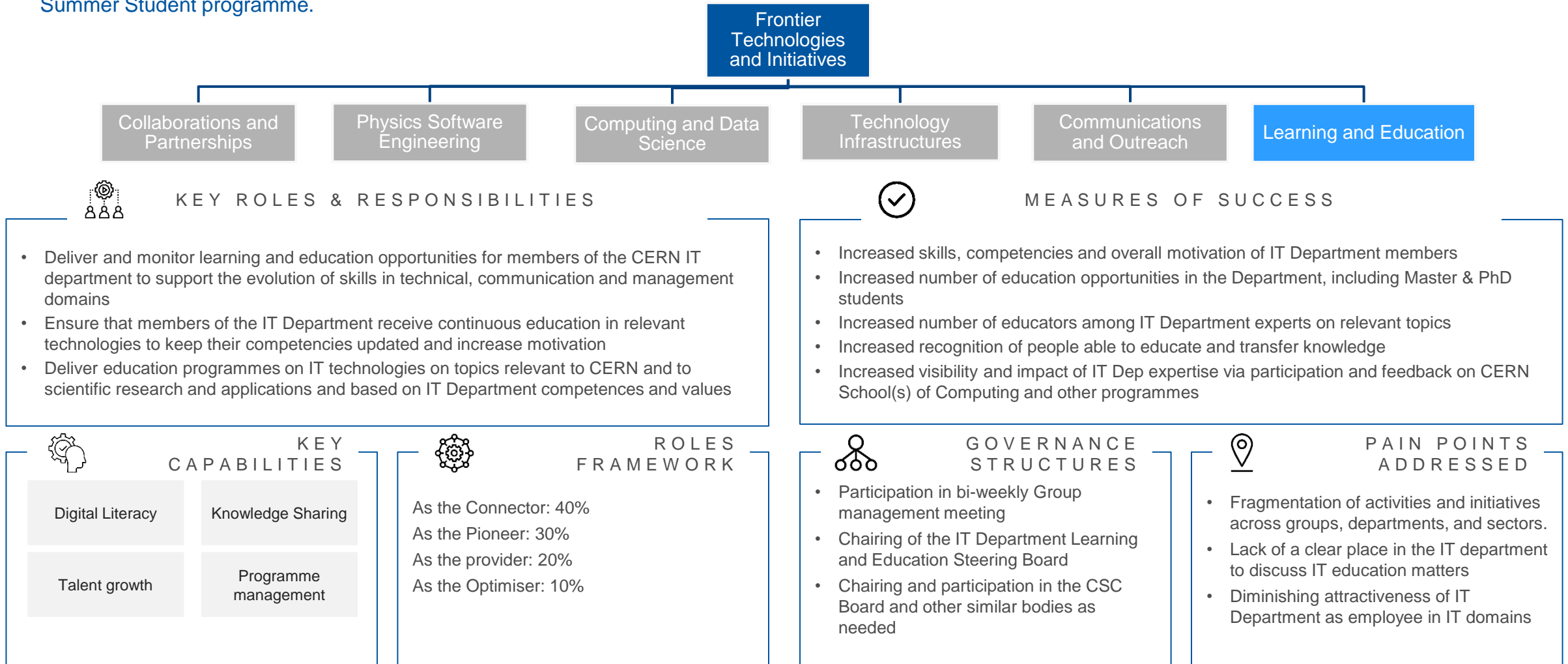
- Weekly meeting with all IT comms officers involved with the various projects (Editorial team meetings)
- Weekly reporting to Group leader
- Weekly meeting with IR-ECO

PAIN POINTS ADDRESSED

- Communicating the role CERN IT plays in fostering a culture of continuous improvement and cutting-edge solutions more clearly
- Communicating technical topics

Learning and Education: Functional overview

The Learning and Education team is responsible to define and execute the processes and mechanisms through which the IT Department builds and transmits knowledge to support its current and future strategic objectives. This includes supporting the internal evolution of skills and behaviours, collecting and organising learning resources, and contributing to wider knowledge creation for science and society via initiatives like the CERN School of Computing and the CERN openlab Summer Student programme.



So what's next

- We will (try to) have a Group meeting per month
 - Share information and discuss about topics of broad interests (not necessarily technical)
 - Get to know each other, welcome new people as they join, say good-bye to people moving on through their lives
- I'm collecting ideas about what to do in 2025
 - Pizza is always an option...
 - ... But so is skiing, go-karting, sailing, playing Magic the Gathering, curling, ...
- Let's help each other make the most of the time we spend together, it's normal and even constructive to have different opinions, it's less easy to find ways of sharing them in a safe environment
 - Beyond the technical aspects, it is a high-priority mission for me to make sure everybody and anybody has a way of expressing themselves and feeling great about doing it
 - My door is always open



Let's Glögg!!

And Secret Santa!!