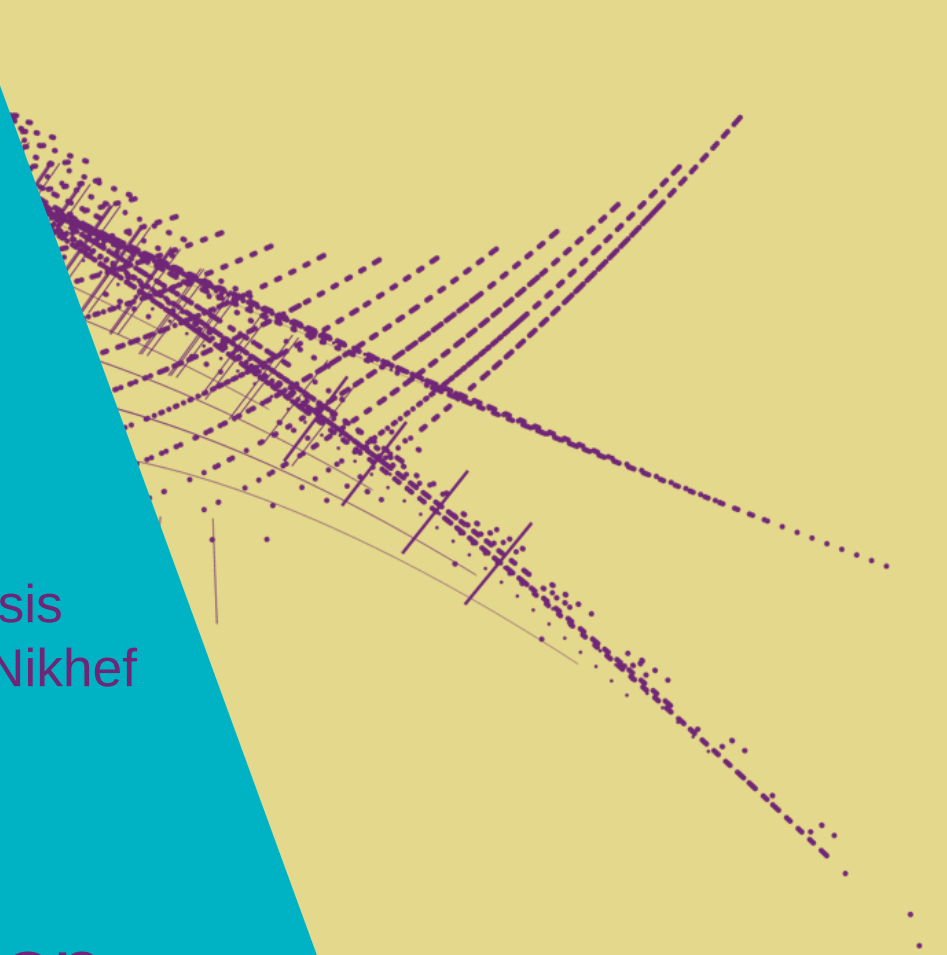
Nikhef



Mission, values, and strategy as the basis
for research and organisational ICT at Nikhef

Principles of Digitalisation

David Groep, 2024

A changing landscape

REGULATIONS

REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AN OF THE COUNCIL

of 27 April 2016

on the protection of natural persons with regard to the processing of pers
movement of such data, and repealing Directive 95/46/EC (General Data

SURF
Security Expertise Centrum

Control Baselines for Information Systems and Organizations

Thema's Downloads Over

Controls

INTERNATIONAL STANDARD

ISO/IEC 27001

Second edition
2013-10-01

Information technology — Security techniques — Information security management systems — Requirements

SB.1.001 Acceptable
Asset Management Low Low

SB.1.002 Governanc
Asset Management Low Low

NBA
Koninklijke Nederlandse Beroepsorganisatie van Accountants

Tools en ondersteuning > Publicaties

Handreiking bij Volwassenheidsmodel Informatiebeveiliging

Het volwassenheidsmodel informatiebeveiliging biedt een handreiking om te beoordelen hoe het staat met de informatiebeveiliging binnen een

Image sources: PZ0151 (https://commons.wikimedia.org/wiki/File:PundZ_ISO27001_2019_Z2.png), and publications from NIST, European Union, NBA, ISO, SURF; left: Nikhef H137 in ~1990

Balancing goals:
primary mission, security risks, and administrative functions

No single element has primacy in determining digitisation strategy

- Processes can't all be defined 'upfront': science (as every organisation) has *emergent needs*
- Computing is a research instrument, a topic of research, and a facilitator for other things
- Computing is a continuum. From admin to science, from phone to HPC system, …
  - legitimate request by users to have a consistent experience when dealing with computing & services
  - security policy *as such* is not the most important: it's a means to achieve the mission, and defining policies, processes, & procedures does *not* mean reality follows, nor does open science mean all data must be freely accessible
- But 'in pursuit of the goal, anything goes?' is also *not* a foundation for trust

So: we balance risks – and academic research and education *is* by design a risk-seeking

'with great power comes great responsibility'* – education and awareness are key

*) the sudo(8) initial user message

Nikhef's mission

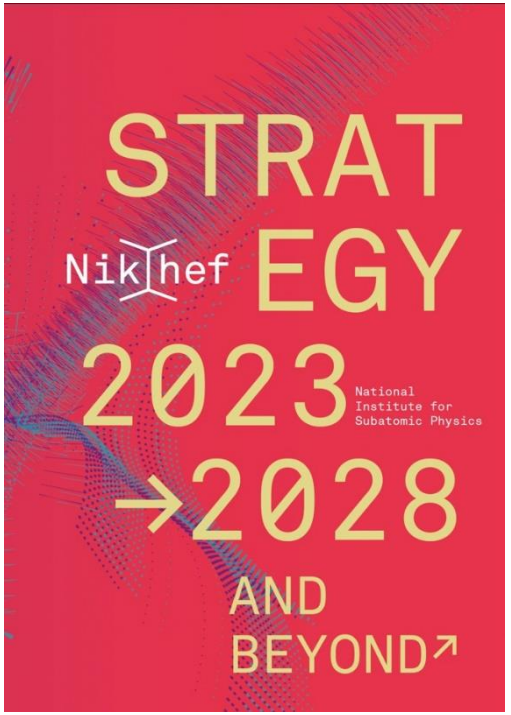
... to study the interactions and structure of all elementary particles and fields at the smallest distance scale and the highest attainable energy.

Two complementary approaches are followed:

- Accelerator-based particle physics – Studying interactions in particle collision processes at particle accelerators, in particular at CERN;
- Astroparticle physics – Studying interactions of particles and radiation emanating from the Universe.

Nikhef coordinates and leads the Dutch experimental activities in these fields. The research at Nikhef relies on the development of innovative technologies.

The knowledge and technology transfer to third parties, i.e., industry, civil society and general public, is an integral part of Nikhef's mission.



The Four Areas of the Nikhef Strategy 2023-2028

Expanding knowledge

Nikhef's main research effort is aimed at further expanding our understanding of the universe in terms of elementary particles and forces, through the interpretation of data, and confronting results with theory and vice versa.

Maintaining infrastructure

Much of Nikhef's effort is put into upgrading and exploiting the current experiments and building new experiments. The technology departments at Nikhef are essential to make this happen.

Preparing the future

Nikhef is constantly innovating towards new technologies and designs of new facilities and projects to explore new scientific challenges and opportunities in the years to come.

Healthy partnership

Nikhef strives to be a vibrant, diverse and inclusive community in the (inter)national field of (astro)particle physics by ensuring a safe work environment and investing in people's talents and expertise.

So what can ICT do that helps fulfil this mission?

Digitisation strategy

Shorten the time-to-research-results through digitalisation,
by processing data faster, more effectively, and more efficiently

So how does digitalisation – the use of ICT systems and services in
a research-driven organisation – enable our mission and strategic vision?

How shall digitalisation be structured to ensure it achieves these goals,
and does not inadvertently impose constraints, hindrance, and
unnecessary complications on our research, innovation, and development?

A new role for the IT Landscape

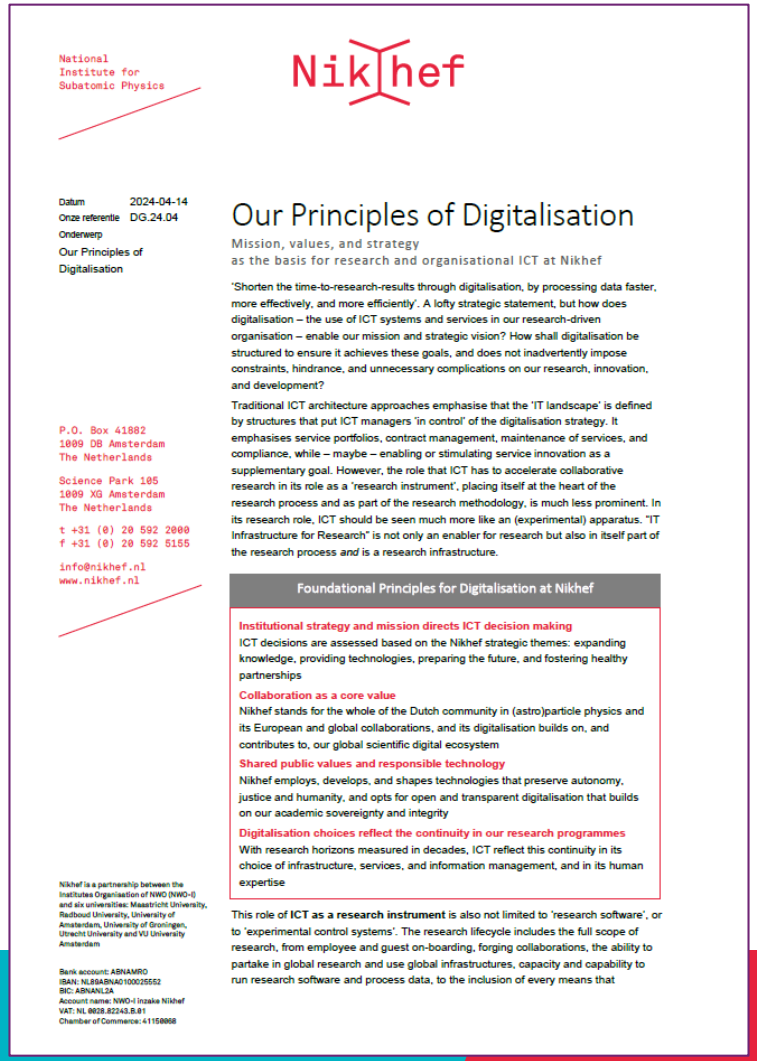
service portfolio management, configuration management, supplier relationship management, service level management (if you're lucky), information security management, … customer relationship management (who came up with *that* term) …

Image: "Bliss", the default Windows XP wall paper. Photo by Charles O'Rear 1996, © Microsoft 2000

Rather than starting with an ICT architecture or landscape …

- What actually drives our (ICT) choices?
- How do they relate to organisational values?
- How do we position our ICT choices in the scientific, societal, and governance landscape?

Those questions deserve an answer ... before drafting any policies, procedures, or compliance requirements



National Institute for Subatomic Physics

Nikhef

Datum 2024-04-14
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Nikhef is a partnership between the Institutes Organisation of NWO (NWO-I) and six universities: Maastricht University, Radboud University, University of Amsterdam, University of Groningen, Utrecht University and VU University Amsterdam

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Our Principles of Digitalisation

Mission, values, and strategy
as the basis for research and organisational ICT at Nikhef

'Shorten the time-to-research-results through digitalisation, by processing data faster, more effectively, and more efficiently'. A lofty strategic statement, but how does digitalisation – the use of ICT systems and services in our research-driven organisation – enable our mission and strategic vision? How shall digitalisation be structured to ensure it achieves these goals, and does not inadvertently impose constraints, hindrance, and unnecessary complications on our research, innovation, and development?

Traditional ICT architecture approaches emphasise that the 'IT landscape' is defined by structures that put ICT managers 'in control' of the digitalisation strategy. It emphasises service portfolios, contract management, maintenance of services, and compliance, while – maybe – enabling or stimulating service innovation as a supplementary goal. However, the role that ICT has to accelerate collaborative research in its role as a 'research instrument', placing itself at the heart of the research process and as part of the research methodology, is much less prominent. In its research role, ICT should be seen much more like an (experimental) apparatus. "IT Infrastructure for Research" is not only an enabler for research but also in itself part of the research process *and* is a research infrastructure.

Foundational Principles for Digitalisation at Nikhef

Institutional strategy and mission directs ICT decision making
ICT decisions are assessed based on the Nikhef strategic themes: expanding knowledge, providing technologies, preparing the future, and fostering healthy partnerships

Collaboration as a core value
Nikhef stands for the whole of the Dutch community in (astro)particle physics and its European and global collaborations, and its digitalisation builds on, and contributes to, our global scientific digital ecosystem

Shared public values and responsible technology
Nikhef employs, develops, and shapes technologies that preserve autonomy, justice and humanity, and opts for open and transparent digitalisation that builds on our academic sovereignty and integrity

Digitalisation choices reflect the continuity in our research programmes
With research horizons measured in decades, ICT reflect this continuity in its choice of infrastructure, services, and information management, and in its human expertise

This role of **ICT as a research instrument** is also not limited to 'research software', or to 'experimental control systems'. The research lifecycle includes the full scope of research, from employee and guest on-boarding, forging collaborations, the ability to partake in global research and use global infrastructures, capacity and capability to run research software and process data, to the inclusion of every means that

Our Principles of Digitalisation

‘If they are many, they are not principles’, so we set only four:

1. **Institutional strategy and mission directs ICT decision making**
   ICT decisions are assessed based on the Nikhef strategic themes
2. **Collaboration as a core value**
   Nikhef stands for the whole of the Dutch community in (astro)particle physics and its European and global collaborations
3. **Shared public values and responsible technology**
   Nikhef employs, develops, and shapes technologies that preserve autonomy, justice and humanity, that builds on our academic sovereignty and integrity
4. **Digitalisation reflects the continuity in our research programmes**
   With research horizons measured in decades, ICT reflect this continuity in its choice of infrastructure, services, and information management, and in its human expertise

What this means for architecture and service management

The Principles do not define an architecture, but drive *how* we see and create one

Using *our own principles to create* ICT architecture!

Human expertise (#4)

Academic sovereignty and integrity (#3)

European and global collaborations (#2)

Institutional strategy (#1):
expanding knowledge, preparing the future, fostering healthy partnerships

Architecture becomes an *emergent result* of applying the Principles:

“made jointly and continuously by our computing and data experts and the users in the Nikhef community,”

“in line with their own and our collaborative assessment of how digitalisation can enhance Nikhef as an organisation,”

“and how therewith to best implement our mission.”

Example: redefining the concept of service management

IT Service Management (ISO20000, ITIL, FitSM) promote
a *specific definition* of service portfolio management:

> "**Product/service portfolio** The product/service portfolio is the complete set of products and/or services *that are managed by the organization*, and it represents the organization's commitments and investments across all its customers and market spaces. …"
> [ITIL v4, chapter 5]

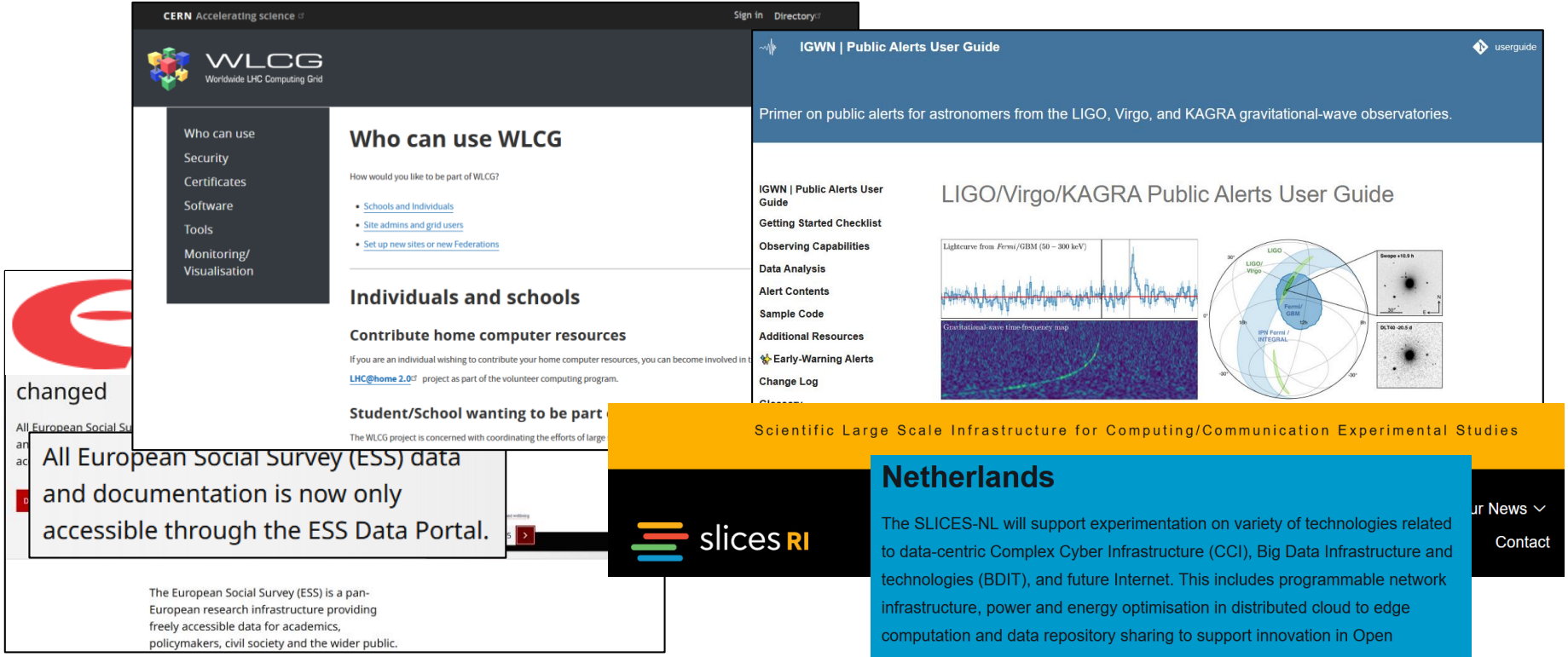
Concept of 'services' in collaborative research is entirely different:

- coming from existing collaborations and infrastructures, many or most services *already exists and used extensively* by research and collaborative administration;
- they are an *essential part of collaborative research*: they should be embraced;
- whether a 'service' is operated by a third party, our outside (local) ITSM control is *immaterial to the value of the service*

About ESFRIs, GWIs, the European Open Science Cloud

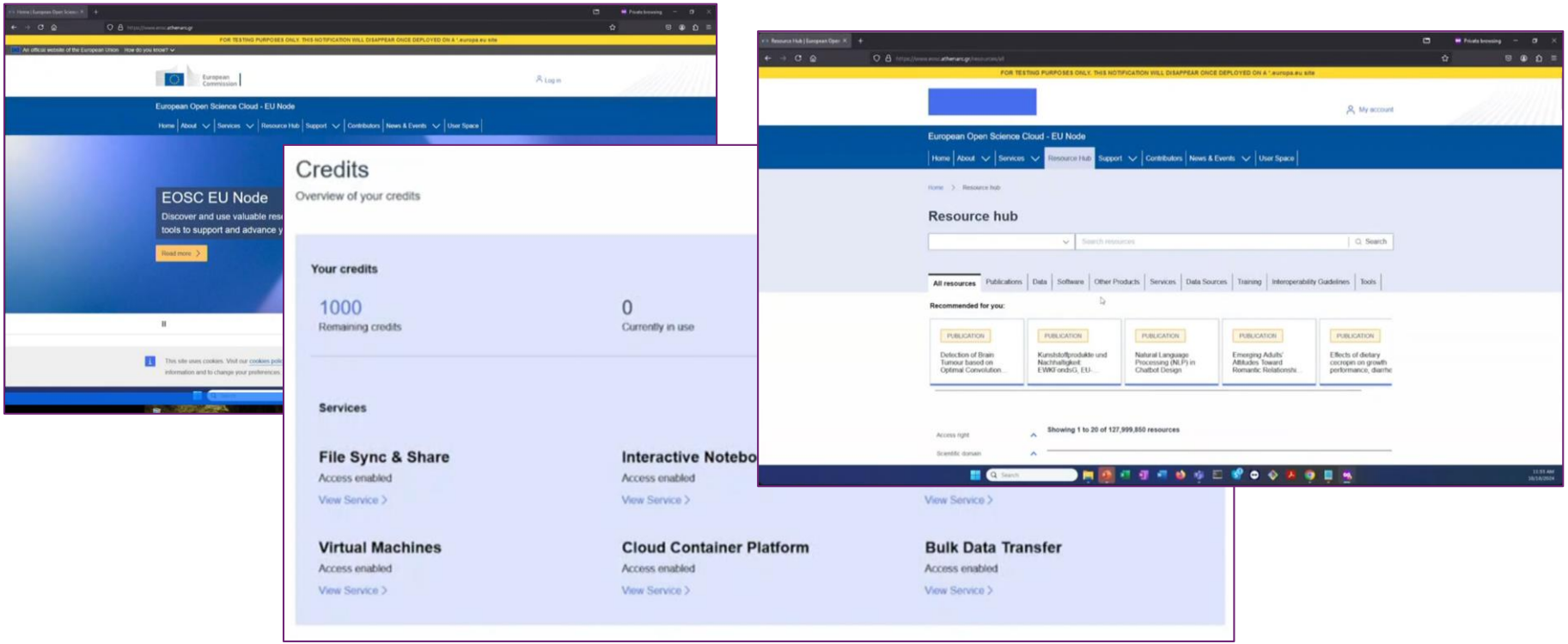
See e.g. https://www.onderzoeksfaciliteiten.nl/; https://www.esfri.eu/; https://landscape2024.esfri.eu/; https://eosc.eu/building-the-eosc-federation/

Research Infrastructures both users and providers … and ‘we’ are as well!



https://rtd.igwn.org/; https://www.europeansocialsurvey.org/; https://wlcg.web.cern.ch/; https://www.slices-ri.eu/consortium-netherlands/

And some EOSC is coming ‘whether you want it or not’ …



https://webcast.ec.europa.eu/eu-node-technical-launch-event-24-10-10

Translating principles to actionable practice

The Foundational Principles underpin everyday strategic decisions and their practical implementation

- strategic implementation choices should be **broadly consistent**
- **evolving over time**, like we evolve the Nikhef strategy itself
- implementation should be consistent and fair,
- and come through a **transparent process**

Principles cheat sheet

1. Institutional strategy and mission directs ICT decision making
2. Collaboration as a core value
3. Shared public values and responsible technology
4. Digitalisation choices reflect the continuity in research programmes

Practices are often a *combination* of the Principles, but let's group them anyway

Institutional strategy and mission directs ICT decisions

"ICT decisions are assessed based on the Nikhef strategic themes: expanding knowledge, providing technologies, preparing the future, and fostering healthy partnerships"

- ICT infrastructure and services are ***in themselves*** **a research instrument**, similar to our detectors, for local users, and also for our collaborators
- design decisions made in the architecture of infrastructure and networks **respect the primacy of our scientific mission**
- the concept of '**bring your own device**' is taken as a given for digitalization
- **open, innovative, and scalable solutions are preferred** over minimalistic offerings that may appear to have lower cost, but oft are soon inadequate
- The approach to all IT risk management is based on **subsidiarity and devolution**, unless there are clear reasons to centralise risk acceptance
- also provide a **return to industry and civil society** by co-creating future computing and networking infrastructure

Collaboration as a core value

“Nikhef stands for the whole of the Dutch community in APP & PP, and its collaborations, and its digitalisation builds on, and contributes to, our global scientific digital ecosystem”

- **development, operation, and sourcing is done in collaboration**, and we engage with our partners long-term, prioritizing collaborative & federated solutions
- access through federated **trust and identity that allows granting access** to our scientific collaborations, national or global R&E community, or the public at large
- federation is **multi-lateral by construction**:
  users must not be bound to a single supplier or single identity
- what we develop is open and re-use friendly: we protect that openness through OSI endorsed licensing, with ‘**open source first**, unless’ policy that encourages open standards, longevity, and preservation of autonomy that is essential for our long-term science goals
- we collaborate with and **contribute to the open source community**

Shared public values and responsible technology

"Nikhef employs, develops, and shapes technologies that preserve autonomy, justice and humanity, and opts for open and transparent digitalisation that builds on our academic sovereignty and integrity"

- **self-assessment and peer review** are part of our common heritage and as applicable to digitalisation as they are to research in general
- **public values as drivers** for our choices made in the implementation of digitalisation not only in research services, but also in enterprise and back-office
- in academia, *everyone is already guided by our common integrity principles*

  honesty, scrupulousness, transparency, independence, and responsibility
- **academic freedom** inextricably linked to digitization, since ICT infrastructures (in the broadest sense, not limited to scientific computing aspects) **fundamentally determines whether we can perform the research we set out to do**

Netherlands Code of Conduct for Research Integrity 2018: https://www.nwo.nl/en/netherlands-code-conduct-research-integrity

Shared public values: preservation of autonomy

*"employs, develops, and shapes technologies that preserve **autonomy**, justice and humanity"*

- practical autonomy: nature and longevity of our programmes means our **needs will nearly always outlive any offering made to us** by 'closed' commercial from outside our own communities (and those who share our long-term outlook)
- for commercial services **there always must be an exit-strategy**, and moving services back to 'in-house' facilities and services must always be a viable option
- **expertise to assess services on technical merit must be retained** at Nikhef, to be able to specify technical requirements and assess vendor-proposed solutions and deliveries on compliance
- we pursue a **multi-vendor model with standards-based interoperability** and ability to migrate data between different vendors using open formats
- We **retain control over our own data**

Shared public values: justice: trust and transparency

*"employs, develops, and shapes technologies that preserve autonomy, **justice** and humanity"*

- we **take care of data entrusted to us**, both scientific data – where open access, FAIR data management, and open source software are key elements –
  as well as any sensitive and personal data we process

- acknowledge also '**legitimate (or customary) expectation**' and the '**intent**' of laws and regulations as significant elements in how to act justly

- **respect for the people** whose data we process: be it personal data or the result of their decades of scientific work
  and this extends to whether, and how, we intervene with their devices and network behaviour for monitoring

Shared public values: humanity

*"employs, develops, and shapes technologies that preserve autonomy, justice and **humanity**"*

- **founded on research integrity and ethical norms** rather than on enforced adherence to regulatory and contractual frameworks. Get adherence 'bottom-up', using positive incentives
- **digitalisation is there to support the people**, and we do not a-priori block access to services, tools, or facilities that could help the user
- **not a `free-for-all': with great freedom comes great responsibility**
- establish **acceptable use aligned with our global collaborative consensus**
- we encourage **learning from our mistakes together** and allow people to make mistakes – as long as we are all open about having made those mistakes
- **encourage responsible disclosure**

'The best research is made in a climate where opposing ideas are welcome, questions explained and mistakes gauged'

Choices reflect the continuity in our research programmes

“With research horizons measured in decades, ICT reflect this continuity in its choice of infrastructure, services, and information management, and in its human expertise”

Today building the systems and collecting data we know we will use the next 30+ yrs

- any products we procure or commercial services and software we use will change beyond recognition, be obsoleted by its supplier, or become extortive, and **any supplier will either fail or no longer be innovative**
- **Nikhef avoids sourcing that would lead to vendor lock-in** and emphasises the use of open formats and protocols, unless services are just ephemeral
- choices need a mechanism to adjust and evolve underlying technologies, enabled by **human expertise, organisational memory and continuity of staff**

So our principles of science inspire our digitalisation

open access to our collaborative global infrastructures,
'ICT infrastructure is a research instrument in itself',
FAIR infrastructure,
mindful of programmatic research
rather than short-cycle or project-based approach

Our Principles of Digitalisation

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Available from https://go.nikhef.nl/principles-of-digitalisation for reflection

Collaborating on ICT infrastructure collaboration
Innovatiezone: *Gemeenschappelijke Digitale Soevereiniteit*

- Bewustwording en kennis over alternatieven, creëren van draagvlak en bereidheid om dit serieus te ontwikkelen;
- Sturing op aanpassing van de Sourcing strategieën (van alle leden), acceptatie van Open Source;
- Investering in AI op basis van alternatieve ontwikkelingen;
- Mandaat om hier binnen SURF al pilots op te ondernemen; en
- Breed communiceren over beschikbare alternatieven en geleerde lessen.

Innovatiezone Gemeenschappelijke Digitale Soevereiniteit

Naar meer regie over de digitale omgeving op basis van publieke waarden

Bijeenkomst (virtueel): 13 september 2024, 12:30 - 14:00

SURF

Agendapunt 1.

Governance van de Innovatiezone

De dagelijkse operationele aansturing als ook de facilitering van de innovatiezone zal door SURF worden verzorgd. Net als andere zones is iedere innovatiezone is een complex vraagstuk waarvoor we samenwerken aan een oplossing. Dat doen we als SURF-organisatie met leden én als leden onderling.

Voor de invulling van de governance van de innovatiezone zijn er meer opties mogelijk en liggen er kansen om met behulp van bestaande gremia hier een passende vorm bij te vinden.

Er zijn meerdere bestaande gremia die een rol zouden kunnen spelen als het gaat om aansturing, mandaat, voortgang, uitdragen of advies, denk hierbij aan:

Koepels

Universiteiten van Nederland · Vereniging Hogescholen · Research & Overig

mbo digitaal · MBO Raad · NFU · AcZie

CSC's

CSC mbo overleg
CSC hbo overleg
CSC wo overleg
CSC Voorzitters overleg

Per CSC:
- Linking-pins
- Een voorzitter

Raden en verbanden

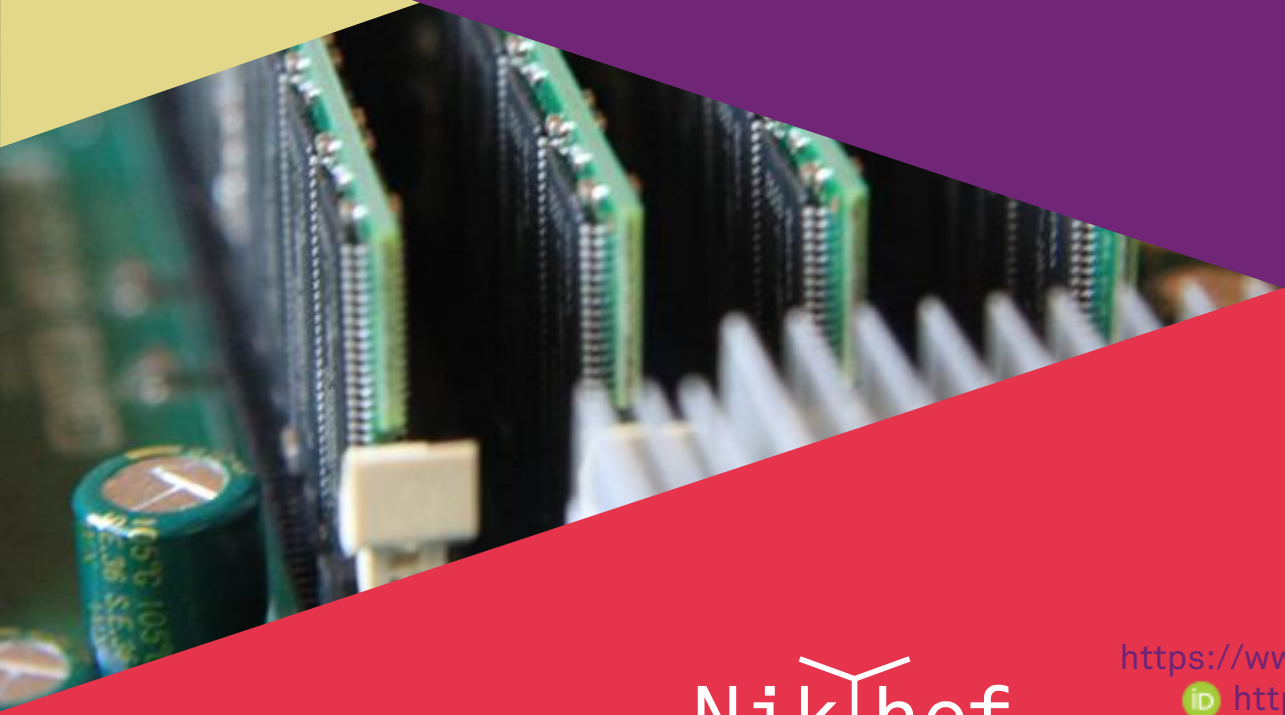
Ledenraad (LR)
- In z'n geheel
- Afvaardiging LR
- Vertegenwoordiging LR

UKB

WTR
- In z'n geheel
- Afvaardiging WTR

RvC van SURF

Yes, we can!



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