

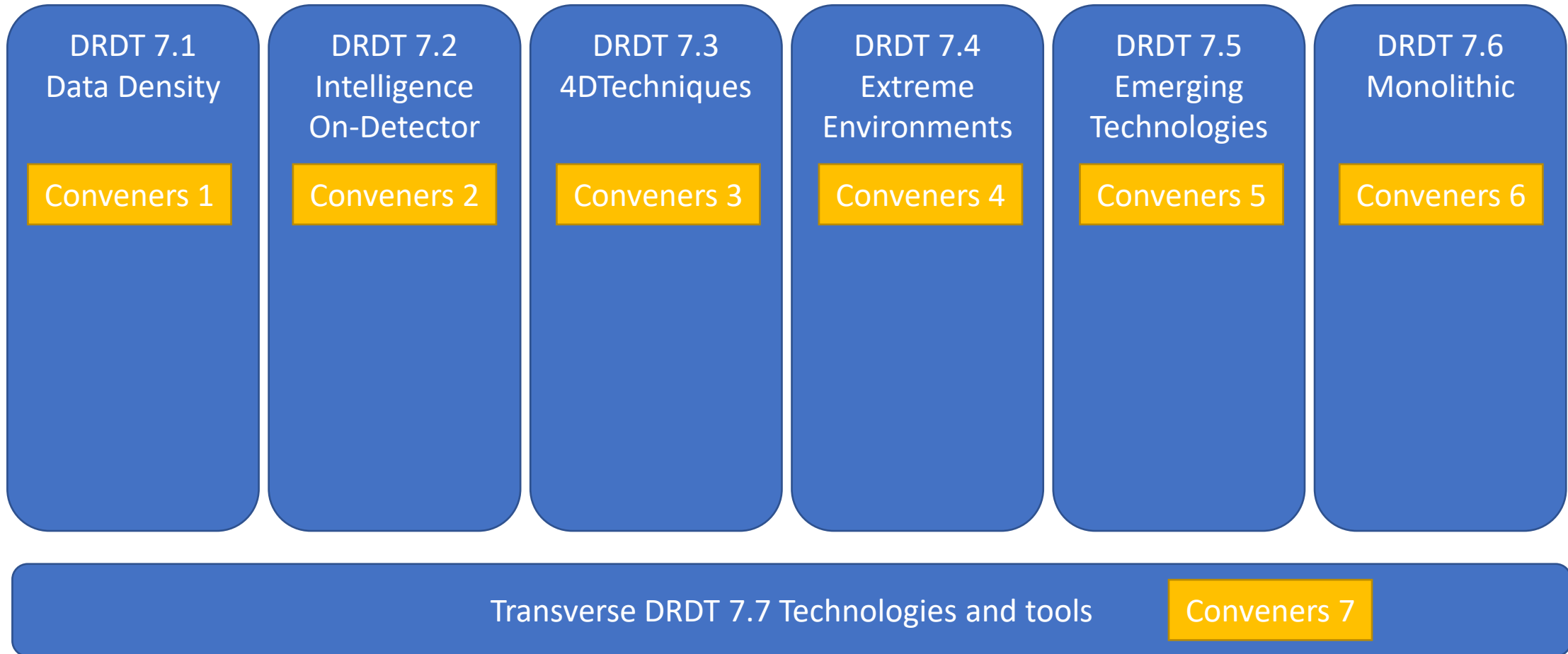
ECFA Detector R&D Roadmap Implementation DRD7 Electronics Workshop Concluding Notes



a) Statistics

- Registered participants: 169
- Online participants
 - DRDT7.1 105
 - DRDT7.2 98
 - DRDT7.3 109
 - DRDT7.4 62
 - DRDT7.5 89
 - DRDT7.6 84
 - DRDT7.7 84

b) DRD7: a rich portfolio of themes



c) DRD7: multiple objectives

1. Carry out strategic R&D in electronics
2. Help maintain an active community despite the complexity challenge
3. Coordinate cross-European access to technologies, tools and knowledge
4. Interface with other DRDs

c1. Carry out strategic R&D in electronics

- R&D effort in electronics is what we mostly heard about in the workshop
 - In addition to the specific challenges described, we can observe additional ones:
 - Multi-disciplinarity (theme-transversality)
 - System-level engineering and optimization (FE-BE processing, link bandwidth & aggregation, full custom vs COTS ...)
 - Single points of failure (Technology qualification, powering, links, ...)
 - Increasing emphasis on software
- Rolling R&D process
 - Start small and grow
 - Will not cover all R&D endeavors: focus on only a few strategic projects per theme
 - Will establish guidelines to form a project, taking into account above challenges and project vision
- Large spread in target applications
 - One size does not fit all – allow reasonable diversity
- Long timeline
 - Generation change, competency profile evolution
 - Need to include (and profit from) steppingstones
 - Ride with caution the experiment-specific / generic development border-path
 - Avoid incremental developments and focus on innovative/transforming R&D
 - Accept reasonable risk

c2. Help maintain an active community despite the complexity challenge

- ASICs are in our minds, they are precursors
 - Optics, FPGAs, soft/firmware, backend are also facing challenges
 - Complexity trend will continue
 - Access costs to advanced technologies will sky-rocket
- DRD7 to provide, through funded R&D effort:
 - Common components beyond the scope of individual DRDs or experiments
 - Common IP, methods, tools
 - Facilities and effort towards full-system demonstrators beyond the scope of individual projects
 - Collective knowledge to review major developments across the DRD and experiments landscape
- Not everyone can do everything
 - Some expertise is not widely spread
 - Tier concept introduced in roadmap document as model to address complex activities relying on distributed competences
 - Price to pay to keep access to fancy technologies open to most

c3. Coordinate cross-European access to technologies, tools and knowledge

- Best exemplified by DRDT7.7
 - Currently mostly led by very few labs
 - Some key expertise is unique and becomes a single point of failure
 - Commercial, legal and export control constraints become increasingly complex
 - Opportunity for others to share the load and access the expertise
- Not R&D per se, but a necessary condition to carry out R&D
 - A transverse theme within DRD7
 - A collective responsibility

c4. Interface with other DRDs

DRAFT, under discussion

- R&D in electronics is not carried out in isolation
 - Many engineers will be active in both DRD-specific projects and DRD7 generic R&D
 - DRD-specific projects will take care of
 - Determination of system parameters and specifications
 - Planning and costing of prototype development and production
 - Production, verification, and integration of ASICs and other project-specific components
 - Testing and operation of large-scale prototypes
 - DRD7 projects will
 - Review system specifications and design as requested, possibly also on a rolling basis during the course of the project, and including analysis of engineering effort and specialised skills requirements
 - Provision access to tools and vendors
 - Develop and provision common IP, components, and subsystems, encompassing hardware, firmware and software
 - Develop common, generic, complete components or systems, when too big or too complex to be designed in one single DRD
 - Provision specialised or large-scale facilities for electronic development and testing

d) Next steps

1. Ideas towards a DRD7 structure
2. Ideas towards a project matrix
3. Next steps

Preliminary

d2. Ideas towards a project matrix

Preliminary

- Each DRDT calls for and hosts a set of projects to implement its objectives
- DRD7 aggregates the DRDT portfolios into a coherent proposal to be submitted to DRDC
- Before reaching this stage, we express our intention in a Lol
- The Lol is based on an initial understanding of the project portfolio
- Need to get a preliminary view of emerging projects > project matrix

DRDT 7.x	Project 1	Project 2	...	Project n
Description				
Innovative-strategic vision				
Performance target/timeline				
Contributors & FTE				
Existing R&D framework				
Multi-disciplinary, cross DRDT content				

DRDT 7.y	Project 1	Project 2	...	Project n
Description				

d3. next steps

- Apr 23: DRD7 steering committee issues guidelines and timeline for project pre-proposals
 - Meeting with DRDT conveners, call for pre-proposals with guidelines
- May 23: pre-proposals collected by DRDTs > project matrix
- Jun 23: Lol drafted based on pre-proposals, signature loop
- Jul 23: DRD7 Lol submitted to DRDC

- Q3-4 23 technical and budgetary discussions
 - ??? DRD7 workshop to present pre-proposals and turn them to proposals ???
 - DRDT portfolio grooming by conveners
- Q1-24 DRD7 collaboration proposal drafted and signed
- Q3/Q4-24 MoU

Conclusions

- Keep in touch with your DRDT conveners in view of issuing a Lol by July
- Inform and discuss with your funding agencies
- See you in ~6months (to be confirmed) for episode 2 of the workshop in view of launching a DRD7 collaboration

- Many thanks to:
 - Participants
 - Speakers
 - DRDT conveners
 - DRD7 steering and coordination team
 - Cinzia Pinzoni and CERN-EP department for support