EDISON
building the data science profession
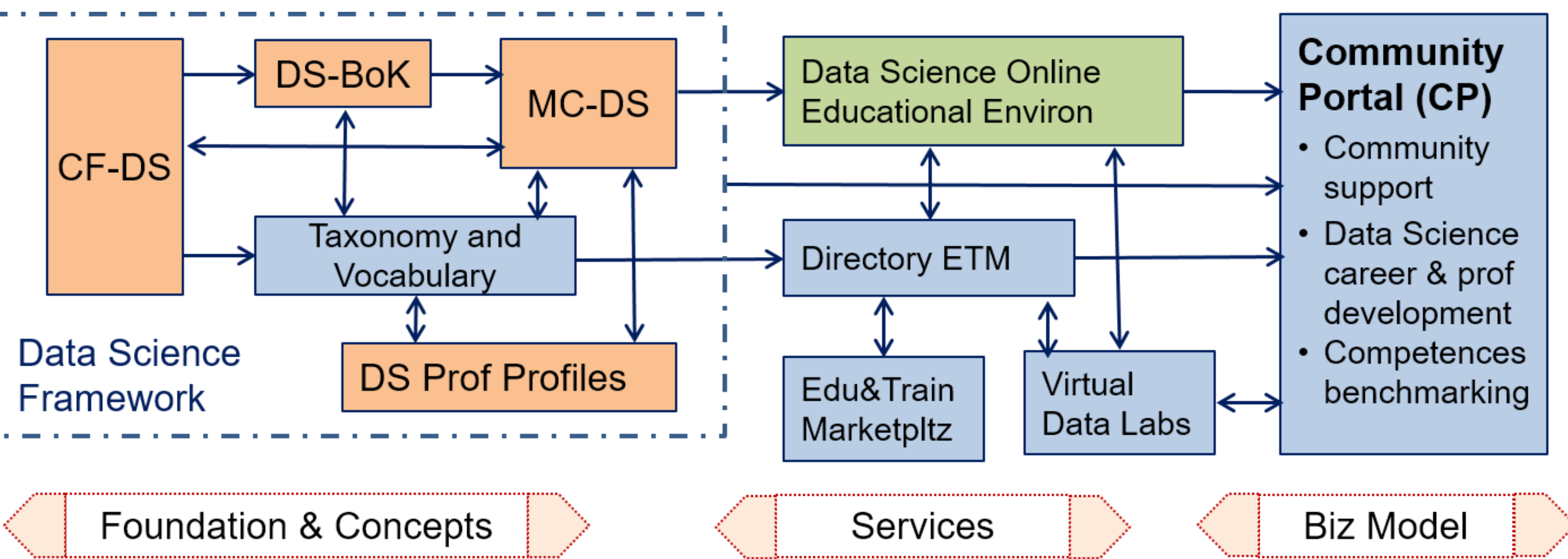
EDISON Data Science Framework (EDSF)

Data Science Professional Education and Training Model: Competence driven curriculum design

EDISON Data Science Framework (EDSF) Release 3

CF-DS → DS-BoK → MC-DS → Data Science Online Educational Environ → Community Portal (CP)
- Taxonomy and Vocabulary
- DS Prof Profiles
- Directory ETM
- Edu&Train Marketpltz
- Virtual Data Labs

Community Portal (CP)
- Community support
- Data Science career & prof development
- Competences benchmarking

Data Science Framework

Foundation & Concepts | Services | Biz Model

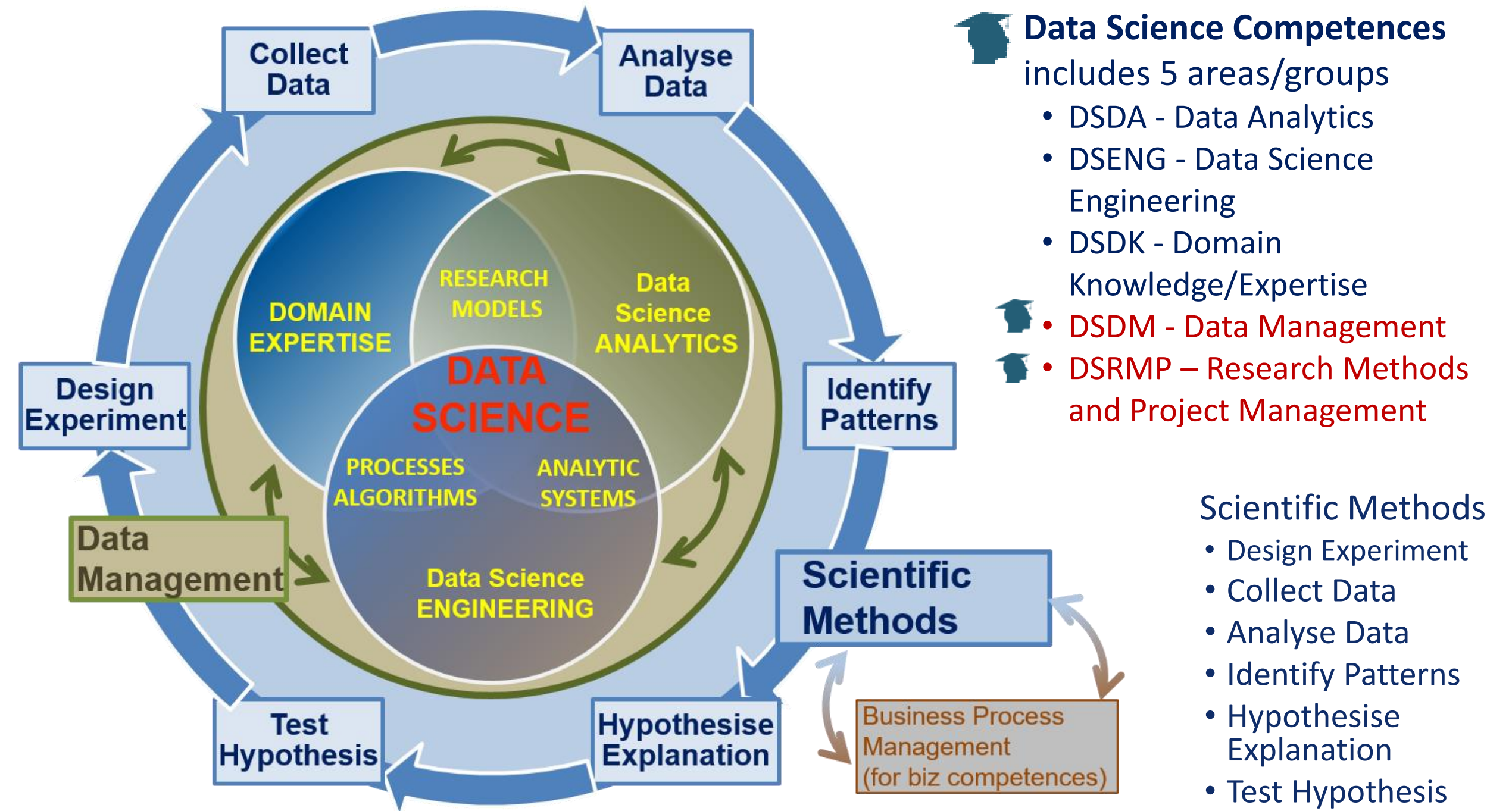**EDISON Data Science Framework (EDSF) provides conceptual basis for the Data Science profession**
- CF-DS – Data Science Competence Framework
- DS-BoK – Data Science Body of Knowledge
- MC-DS – Data Science Model Curriculum
- DSPP - Data Science Professional Profiles
- Data Science Taxonomy and Scientific Disciplines Classification

Service and operational components of the Data Science professional ecosystem
- Community Portal (CP) including
  - EOEE - EDISON Online Education Environment
  - Education and Training Marketplace and Directory
- Professional certification and career development support

Data Science Body Of Knowledge (DS-BoK)

DS-BoK Knowledge Area Groups (KAG) are defined in compliance with the CF-DS
- KAG1-DSDA: Data Analytics group including Machine Learning, statistical methods, and Business Analytics
- KAG2-DSENG: Data Science Engineering group including Software and infrastructure engineering
- KAG3-DSDM: *Data Management group including data curation, Research Data Management, Open Data, Open Access*
- KAG4-DSRMP: *Research Methods and Project Management, use cases/practices*
- KAG5-DSBPM: Business Process Management (data driven)

Includes selected KAG and KU defined in IEEE/ACM CCS (2012), PMI-BoK, BABOK, SWEBOK, DM-BoK, ACM CS-BoK, compliance with CMMI DMM, IT-CMF
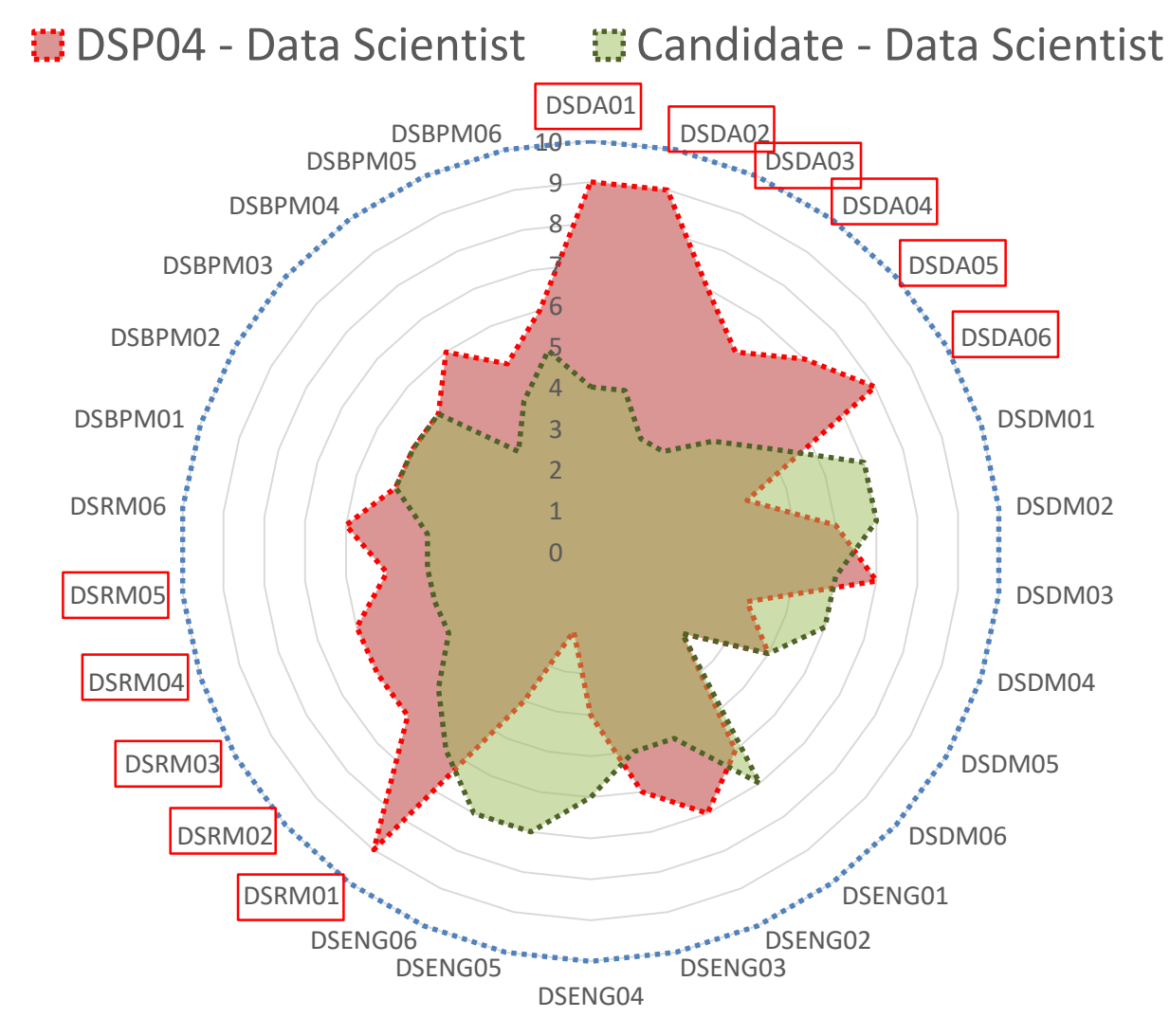
Outcome Based Educations and Training Model:

From Competences and DSP Profiles to Learning Outcomes (LO) and to Knowledge Unites (KU) and Learning Units (LU)

Data Science Competence Framework (CF-DS) → DS Professional Profiles (DSPP)
↓
Learning Outcomes (LO) (OBE Learning Model)
↓
Knowledge Units (KU) (DS-BoK) → Learning Units (LU) (MC-DS)
↓
Tracks/Specialisations (based on DSPP) (LO, LU, KU, courses/modules)
↓
DS Academic Programmes & Professional Training — Courses, Modules → → LO/KU/LU/DSP-P

Virtual Labs Environment & Project Practice — Labs & Practice → →LO/LU/Skills/DSPP

Data Science Competence Framework (CF-DS)

Collect Data | Analyse Data | Identify Patterns | Hypothesise Explanation | Test Hypothesis | Data Management | Design Experiment

DOMAIN EXPERTISE | RESEARCH MODELS | Data Science ANALYTICS | DATA SCIENCE | PROCESSES ALGORITHMS | ANALYTIC SYSTEMS | Data Science ENGINEERING

Business Process Management (for biz competences)

Data Science Competences includes 5 areas/groups
- DSDA - Data Analytics
- DSENG - Data Science Engineering
- DSDK - Domain Knowledge/Expertise
- DSDM - Data Management
- DSRMP – Research Methods and Project Management

Scientific Methods
- Design Experiment
- Collect Data
- Analyse Data
- Identify Patterns
- Hypothesise Explanation
- Test Hypothesis

CF-DS is defined in compliance with the European e-Competence framework for ICT (e-CFv3.0 – 2015/2017)

Dimension 1 - Competence group
Dimension 2 – Competence definition
Dimension 3 - Proficiency level (EQL compliant)
Dimension 4 – Knowledge (KA & KU) and Skills

MATCHING – COMPETENCE PROFILES

DSP04 - Data Scientist | Candidate - Data Scientist

(radar chart axes: DSDA01, DSDA02, DSDA03, DSDA04, DSDA05, DSDA06, DSDM01, DSDM02, DSDM03, DSDM04, DSDM05, DSDM06, DSENG01, DSENG02, DSENG03, DSENG04, DSENG05, DSENG06, DSRM01, DSRM02, DSRM03, DSRM04, DSRM05, DSRM06, DSBPM01, DSBPM02, DSBPM03, DSBPM04, DSBPM05, DSBPM06)

Individual Education/Training Path based on Competence benchmarking

Red polygon indicates the chosen professional profile: Data Scientist (general)
Green polygon indicates the candidate or practitioner competences/skills profile

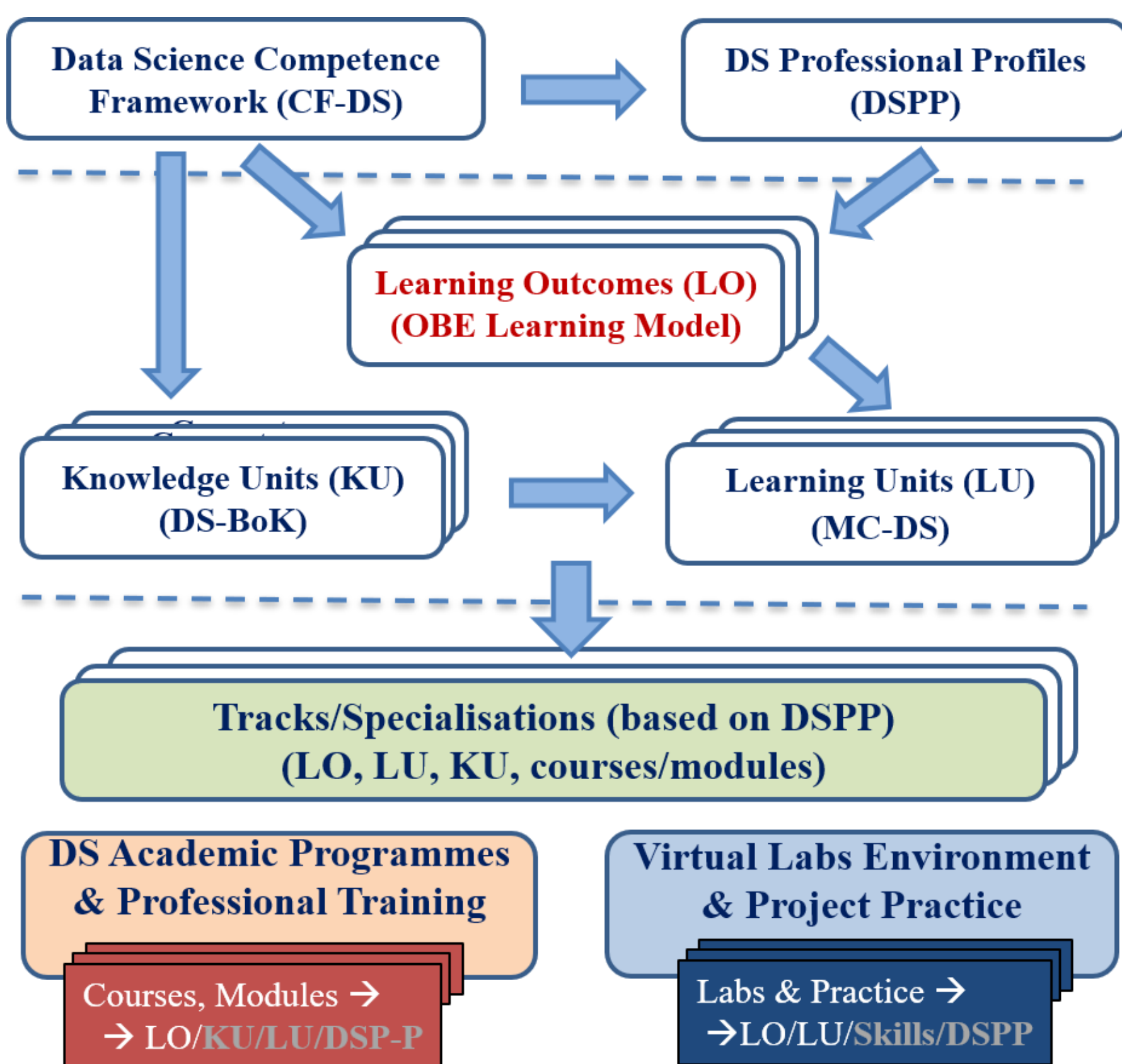**Insufficient competences (gaps) are highlighted in *red***
- *DSDA01 – DSDA06 Data Science Analytics*
- *DSRM01 – DSRM05 Data Science Research Methods*

Can be use for team skills match marking and organisational skills management

[ref] For DSP Profiles definition and for enumerated competences refer to EDSF documents CF-DS and DSP Profiles.

Competence Driven Curriculum Design outcome
- Data Science curriculum for different types of learners and professional profiles
- Virtual Labs and Project Development Environment that can combine local university facility and use cloud based Big Data and Data analytics facilities and services on demand

For more information refer to EDISON Release 3 documents
EDSF github project - https://github.com/EDISONcommunity/EDSF
EDISON Community work area and discussions - https://github.com/EDISONcommunity/EDSF/wiki/EDSFhome
Mailing list - edison-net@list.uva.nl