

EDISON Data Science Framework (EDSF): Facilitating Data Science Curricula Development and organisational capacity building

Working with EDSF: Curricula Analysis



EDISON
building the data
science profession

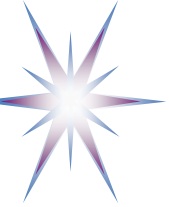
EDISON – Education for **D**ata Intensive
Science to **O**pen **N**ew science frontiers

H2020 INFRASUPP Grant 675419 (2015-2017)

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University of Amsterdam

31 May 2018, Amsterdam





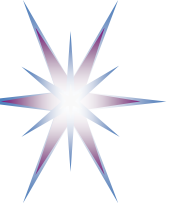
Workshop Agenda

Part 1 10:00 – 13:00

1. Introduction and bootstrapping (30 min)
 - EDISON Data Science Framework and EDISON project legacy.
 - Workshop goals and attendees interests
2. Background information and how the EDSF has been done (60 min)
 - EU and International studies on data related competences and skills
 - EU standards, projects, initiatives, associations
3. EDISON Data Science Framework (EDSF) in details and walk through customised curriculum design (90 min)
 - EDSF components: Competence Framework (CF-DS), Body of Knowledge (DS-BoK), Model Curriculum (MC-DS), Data Science Professional Profiles (DSPP)
 - Walk through customised curriculum design: from target professional groups or competences to curriculum suggestions

Part 2 14:00-16:00+

1. Curriculum analysis and design – Interactive session and practice (in groups)
 - Analysis of Data Science and Data Management curricula by champion universities adopting EDSF
 - Continue with the curriculum design for target professional groups or study programmes
 - Assessment and discussion on Data Science soft skills: workplace and 21st Century
2. Critical issues in implementing research and enterprise Data Science capacity building and Data Management practices: skills management, team building, infrastructure issues.
 - Interactive session and open discussion
3. Closing: comments, future steps, community building



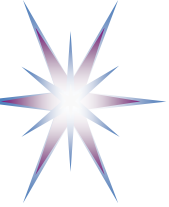
EDSF for Data Science programmes Assessment

- Ideal/Balanced Data Science programme need to include all KAG's
 - DSDA – approx. 40-50%
 - DSENG – approx. 30-40%
 - DSDM – approx. 30-20%
 - DSRMPM – 10-20%
 - Domain Knowledge is acquired as an initial profession education or as practical work
 - May be included in the curriculum as project or staging



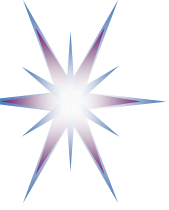
Analysis Data Science programmes 2016

- More than 200 programmes reviewed
- Inventory is available at <http://edison-project.eu/university-programs-list>
- Content of the programmes analysed on included courses by 4 KAGs

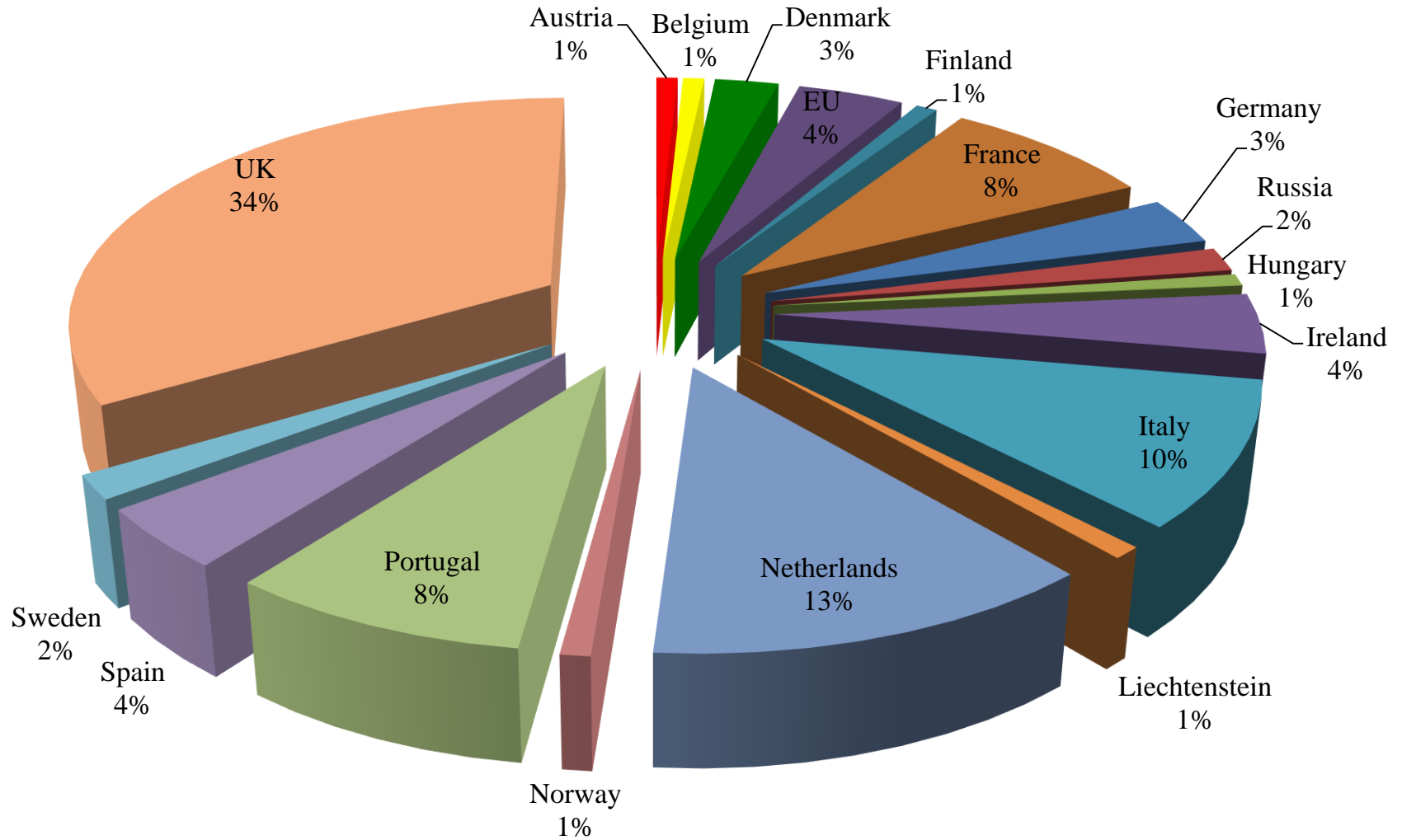


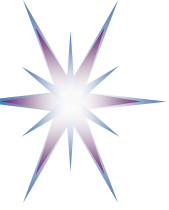
Approach to analysis

- We should expect equal coverage of each competence group
- We established that difference between most and least covered group should not exceed 20% for program to be considered balanced
- Between 20% and 30% we classified program as having a small imbalance
- Over 30% we classified program as imbalanced
 - 30% usually means one of the competence groups is almost not covered at all
- Results are presented as a 2 digit percentage for convenience
 - Quantitative differences of just a few pp should not be over-interpreted
 - Focus is on qualitative differences

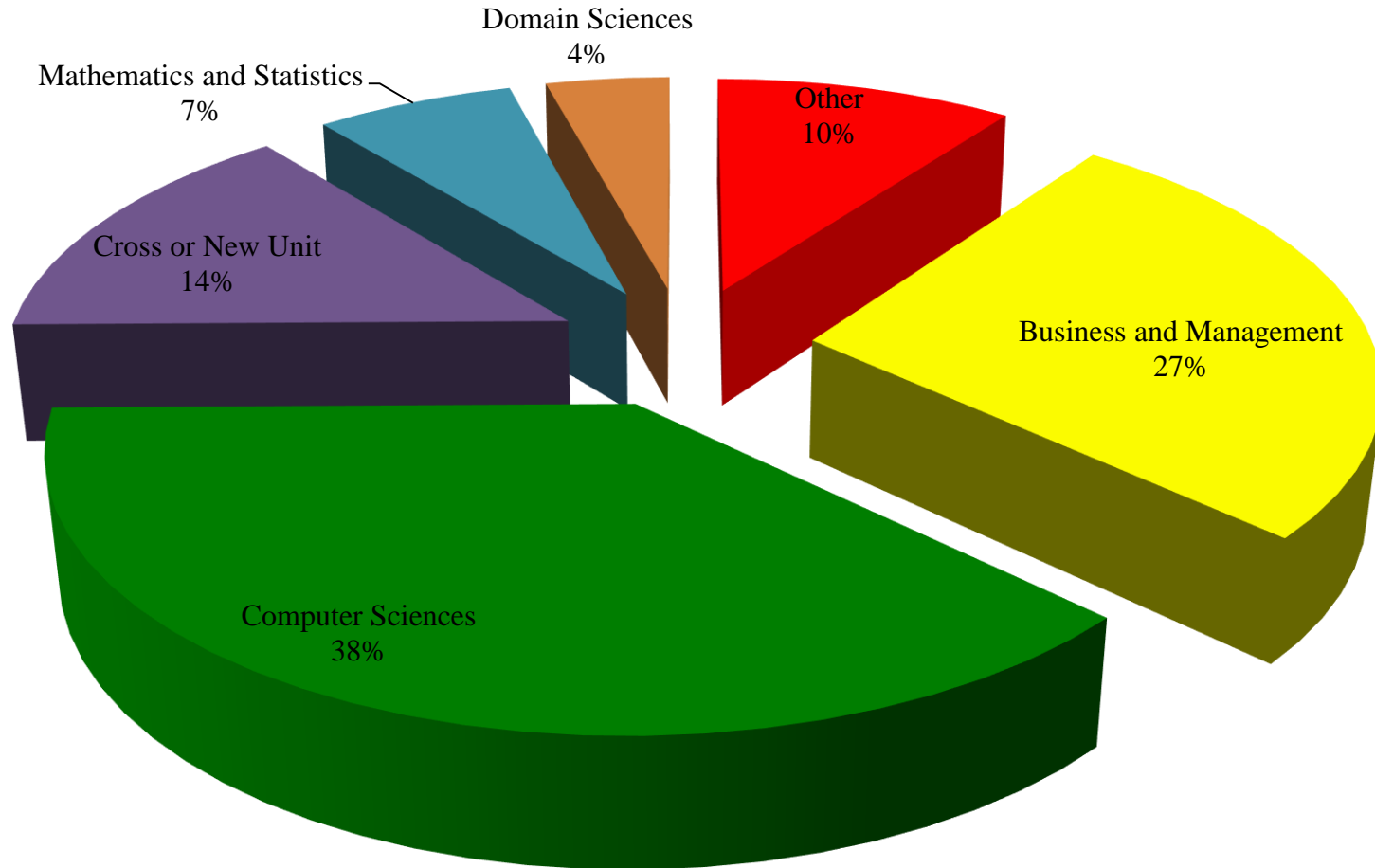


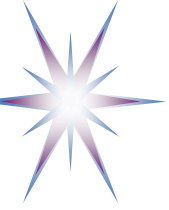
Origin of European Programs 2016



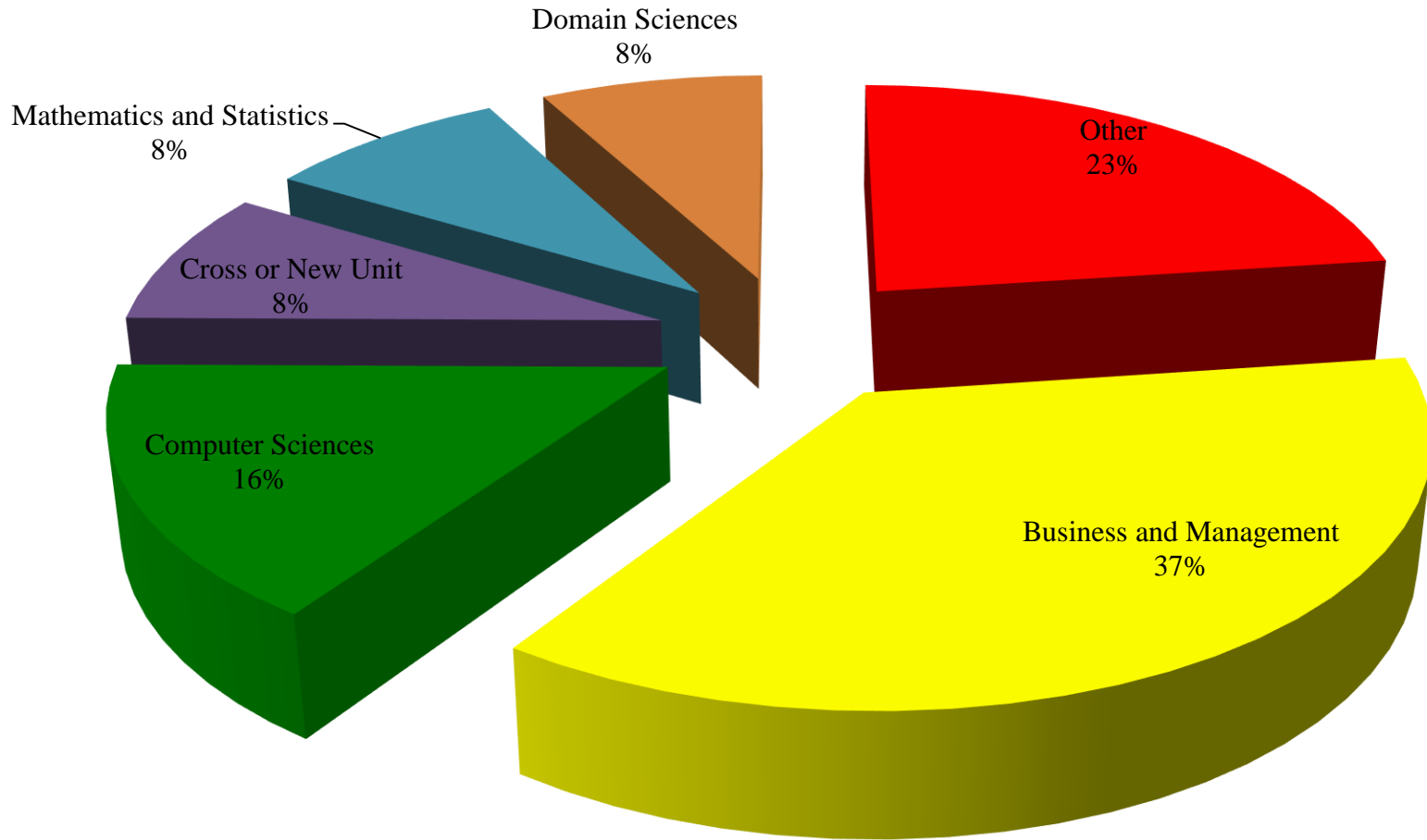


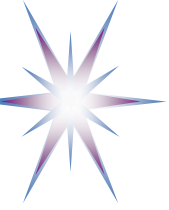
Source of European Programs



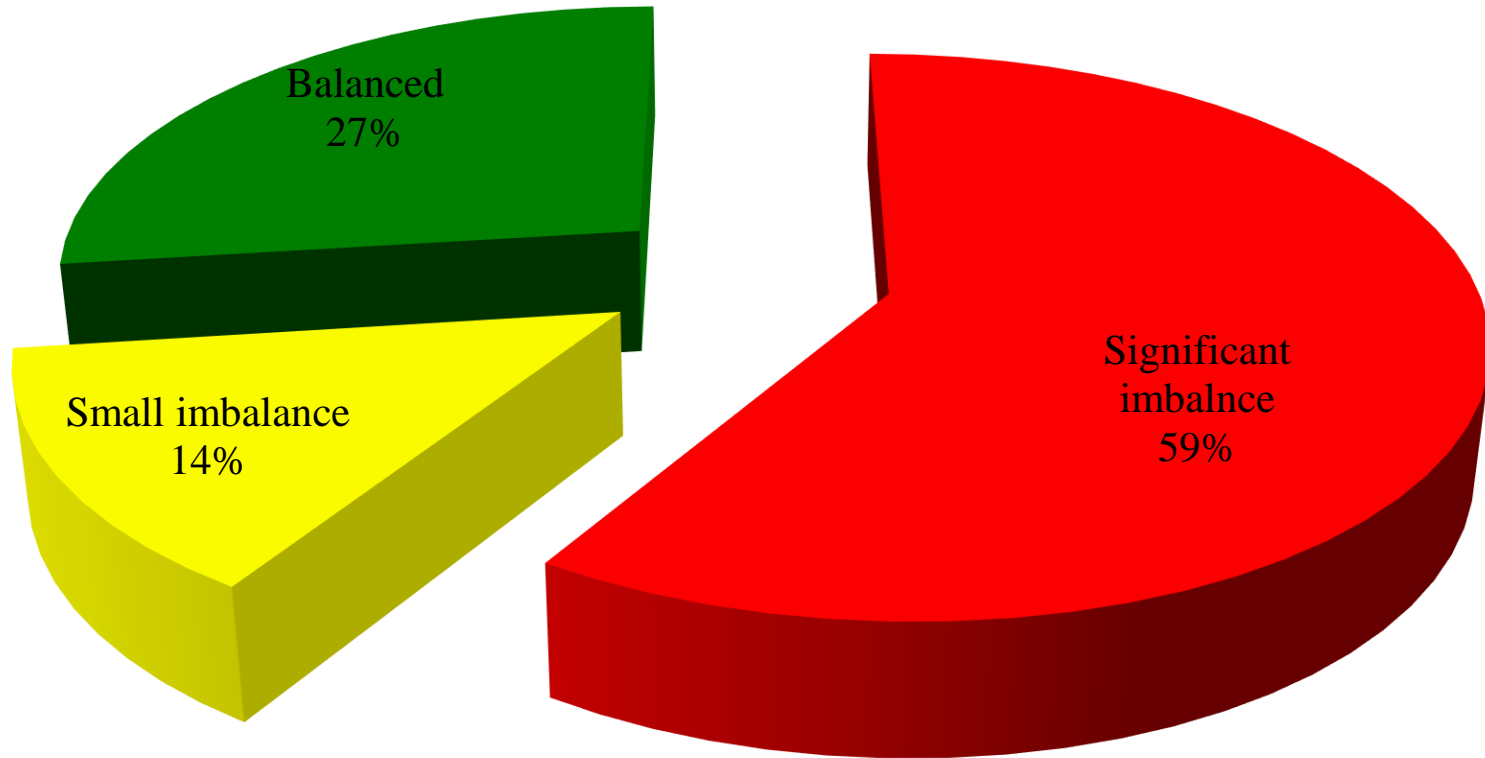


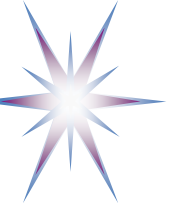
Source of Non-European Programs



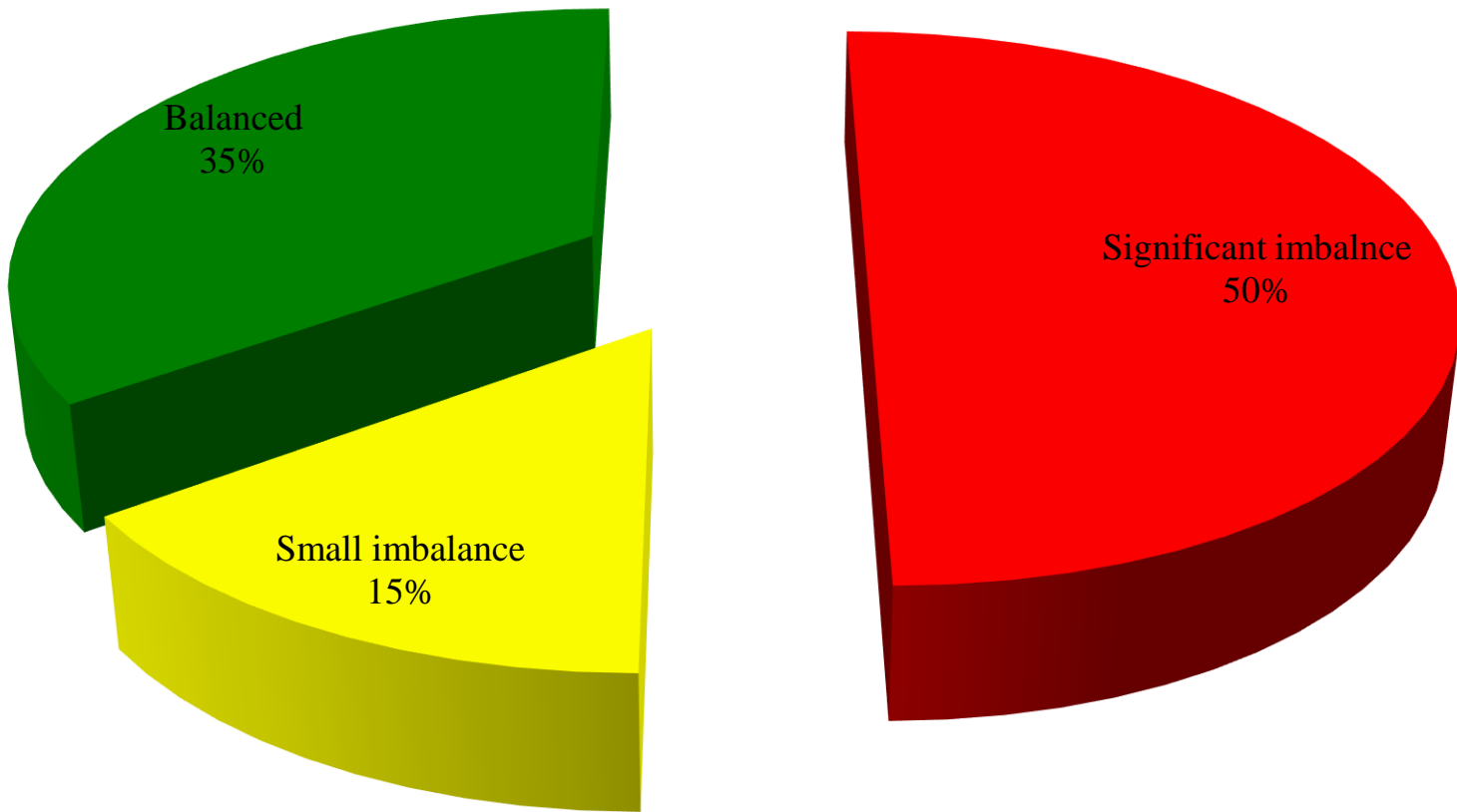


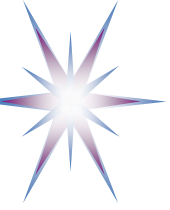
Balance of European Programs



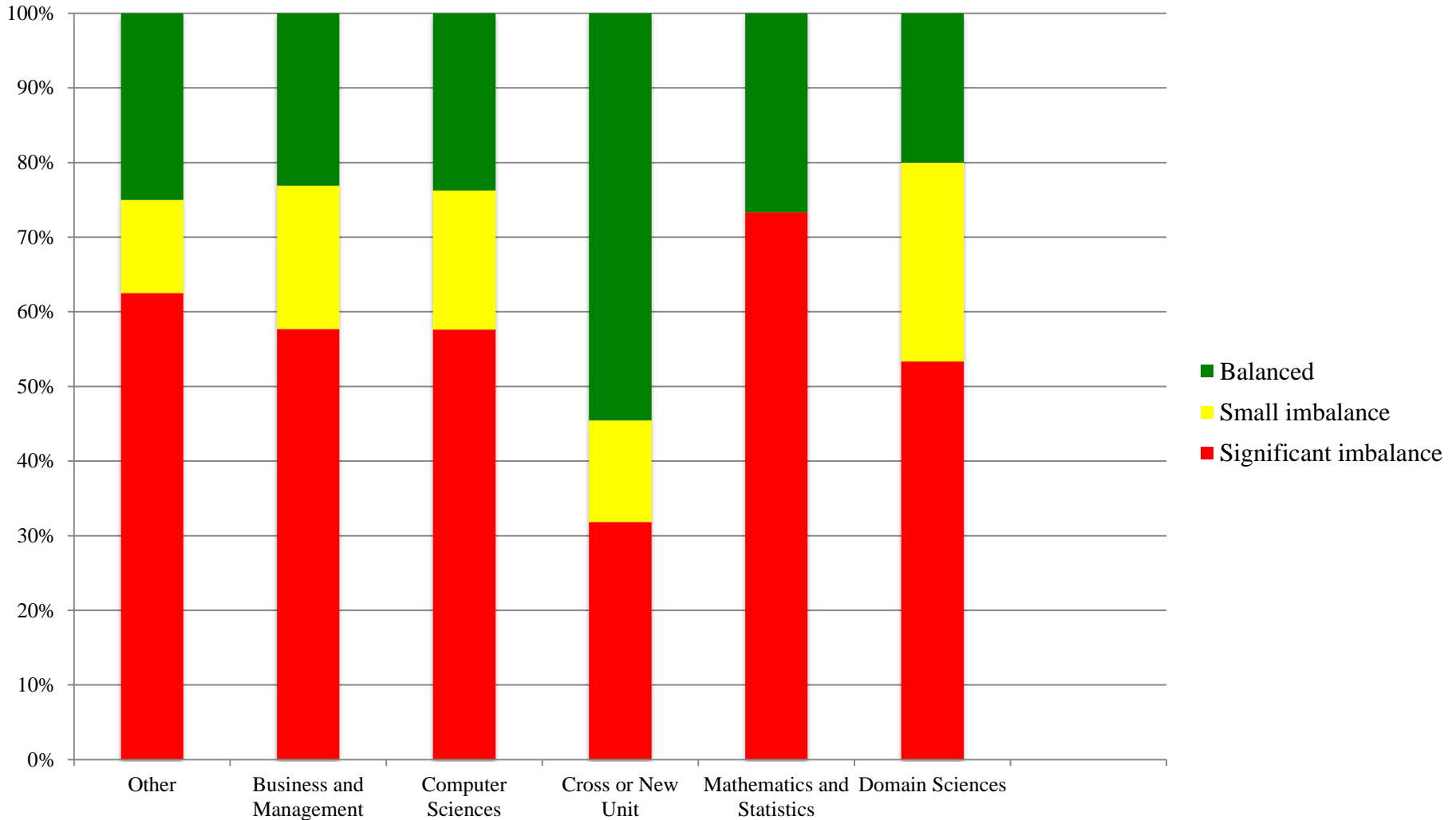


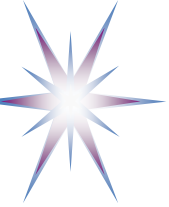
Balance of Non-European Programs





Balance of Programs w.r.t. Source Department





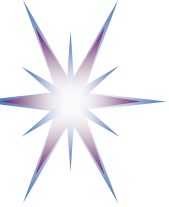
Qualitative analysis of coverage of Data Science Competences

- Only 8% of European programs have learning outcomes formally defined
- Outside Europe it is 16%, mostly due to US influence.
- All programs should have formal learning outcomes
- We also evaluated the quality of learning outcomes w.r.t. Blooms taxonomy
 - very few programs explicitly distribute learning outcomes across various learning levels
 - usually, learning outcomes seemed very generic and offer little useful information



Practice: EDISON Champions Universities

- University of Amsterdam (UvA)
- Univ of Stavanger (UiS)
- Goethe University Frankfurt (GOE)
- University of Bedfordshire (BEDS)
- Lodz University of Technology (TUL)
- University of Perugia (UoP)
- Lucerne School of Information Technology (HSLU)



Links to Workshop Resources

- EDISON Workshop home
<https://github.com/EDISONcommunity/EDSF/tree/master/EDSFcurriculaDesign>
- EDISON Data Science Framework Release 2 (EDSF)
<https://github.com/EDISONcommunity/EDSF>
- (old <http://edison-project.eu/edison-data-science-framework-edsf>)

Component documents

CF-DS – Data Science Competence Framework

https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_CF-DS-release2-v08.pdf

DS-BoK – Data Science Body of Knowledge

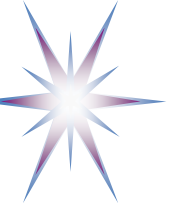
https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_DS-BoK-release2-v04.pdf

MC-DS – Data Science Model Curriculum

https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_MC-DS-release2-v03.pdf

DSPP – Data Science Professional profiles

https://github.com/EDISONcommunity/EDSF/blob/master/EDISON_DSPP-release2-v05.pdf



EDISON Initiative Online Presence

- EDSF github project - <https://github.com/EDISONcommunity/EDSF>
 - Component documents CF-DS, DS-BoK, MC-DS, DSPP
- EDISON Community work area and discussions - <https://github.com/EDISONcommunity/EDSF/wiki/EDSFhome>
- Mailing list - edison-net@list.uva.nl
- EDISON project website (still active) <http://edison-project.eu/>
 - EDISON Data Science Framework Release 2 (EDSF), 3 July 2017
<http://edison-project.eu/edison-data-science-framework-edsf>
- Data Science Community Portal (<http://datasciencepro.eu>)
 - To host future EDISON Community initiatives