



# Curriculum Standard and Certification on Data Science at IPSJ

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Certification

**HITACHI**  
Inspire the Next

- Published IPSJ Curriculum Standard on Data Science on April 2021.
- Accredited Data Science Certification at Hitach co. ltd on September 2021.



# DS Curriculum Development Policy



Covers a wide area of Data Science to ensure international compatibility

- ACM Data Science Curriculum
- Edison Data Science Framework

Collaboration with IPSJ Data Science Certification

- Data Scientist Skill Checklist (developed by Japan Data Scientist Society)

Specify Knowledge and Skill required of the Students Majored in Data Science

Curriculum Size ~ Approx. 675 Class Hours

- 50% of the required credits to graduate Japanese universities

Prerequisite: DS Model Curriculum (Literacy Level)



# Characteristics of the Reference Models



## ACM DS Curriculum

- Detailed Educational Topics Defined
- Priority of Topics: T1, T2, E
- Missing Areas

T1: Required Topic (100%)  
T2: Required Topic (80%)  
E: Elective Topic (50%)

## Edison DS Framework

- Covers the Widest Areas
- ECTS Assigned
- Detailed Topics not Defined

## DS Skill Checklist

- Focused on Detailed Skills
- Prepared for Data Scientist
- Contains Business Skill

Mapping of the  
Three Reference  
Models

Comprehensive  
Curriculum having  
all Advantages



# Organization of the IPSJ DS Curriculum



Top Level Category	T1	T2	E	Total	Effective Time (h)
A: Mathematical Fundamentals and Statistics	18.25		19.00	37.25	27.75
B1: Data Mining	28.00	36.00	78.00	142.00	95.80
B2: Artificial Intelligence	3.25	17.00	12.50	32.75	23.10
B3: Machine Learning	13.75	19.50	13.50	46.75	36.10
C: Modeling and Simulation	11.80	18.38	47.00	77.18	50.00
D1: Fundamental Computer Science	81.16	22.50	26.25	129.91	112.28
D2: Big Data System	7.00	59.50	47.00	113.50	78.10
E1: Security and Privacy	41.93		4.00	45.93	43.93
E2: Human-Computer Interaction	16.83			16.83	16.83
F: Software Engineering	50.50	25.00	38.00	113.50	89.50
G1: Data Collection, Management and Governance	27.01	25.67	17.00	69.68	56.04
G2: Professionalism	16.14	12.01	7.99	36.14	29.74
G3: Business Fundamentals	10.50		8.33	18.83	14.67
Total	326.12	235.55	318.57	880.24	673.85



# Certified IT Professional (CITP Certification)



~ 10K Certification Holders



Feb2018 Accredited

CITP

JITEE (advanced)

JITEE-AP

JITEE-FE

JITEE-IP

Japan IT Engineer Examination

e-CF	SFIA	ITSS
Lv. 3	Lv. 5	Lv. 4
Lv. 2	Lv. 4	Lv. 3
Lv. 1	Lv. 3	Lv. 2
n/a	Lv. 2	Lv. 2
	Lv. 1	Lv. 1

Levels in ITSS			
Level 7	High level IT human resource	Super High	Domestic high-end player and world class player
Level 6		High	Domestic high-end player
Level 5			High-end player within a company
Level 4			High level knowledge and skill
Level 3	Middle		Applied knowledge and skill
Level 2			Fundamental knowledge and skill
Level 1	Entry		Required minimum basic knowledge

Level Description



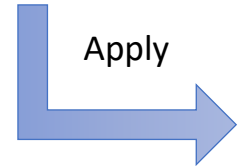
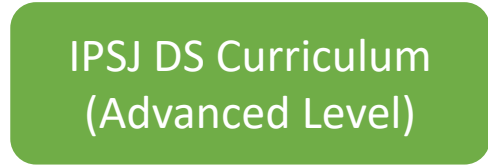
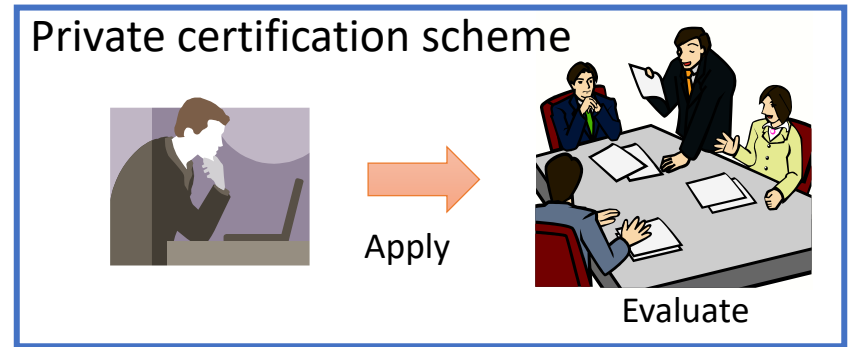


# IPSJ Data Science Framework

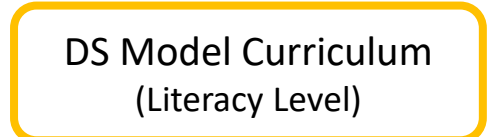
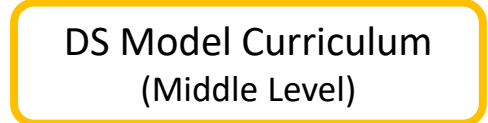
In Progress



e-CF	SFIA	ITSS
Lv. 3	Lv.5	Lv.4
Lv. 2	Lv. 3	Lv. 3
Lv. 1	Lv. 2	Lv. 2
n/a	Lv. 1	Lv. 1



Consortium for Mathematics and Data Science Education





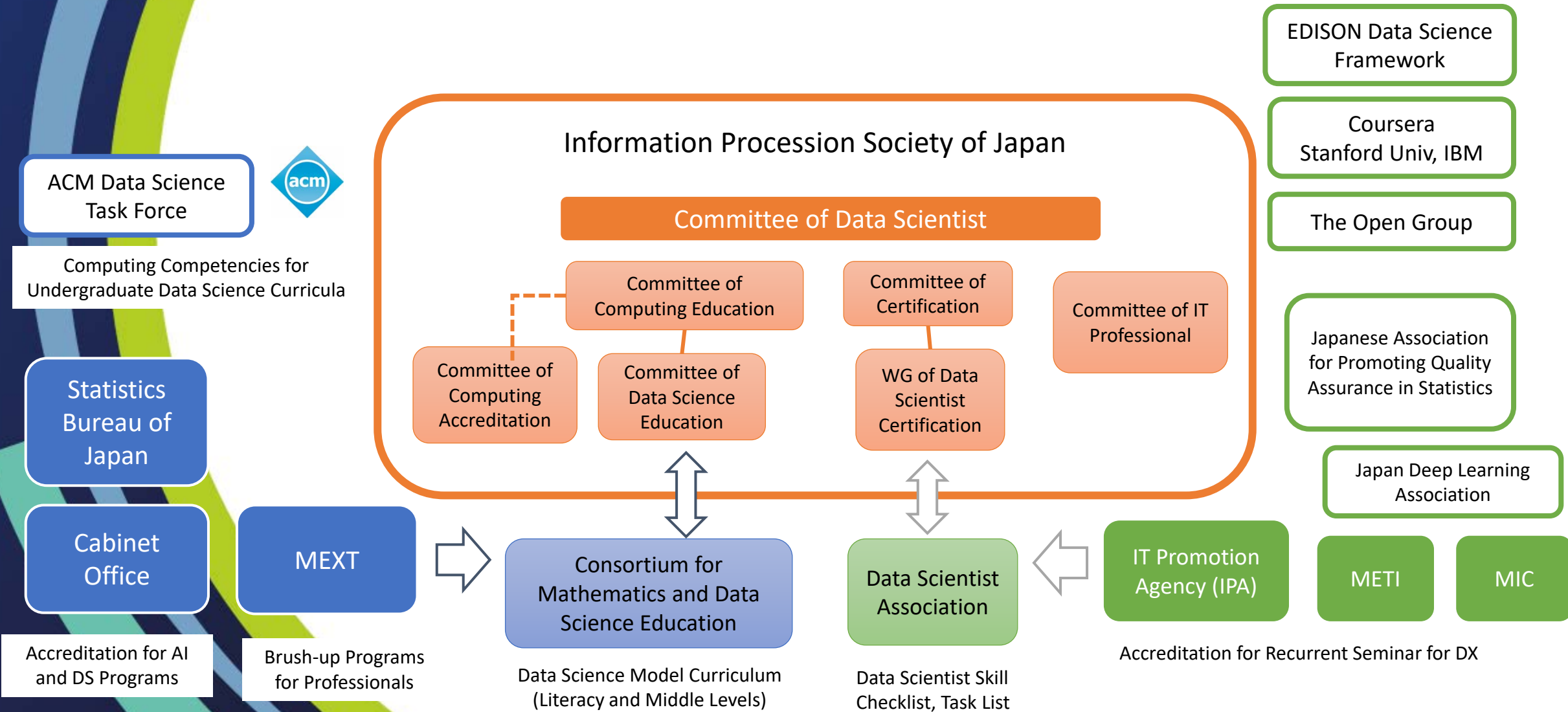
# Topic 1: Current collaboration with other organizations related to DS education and/or DS certification

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# Related Activities on Data Science Education and Certifications



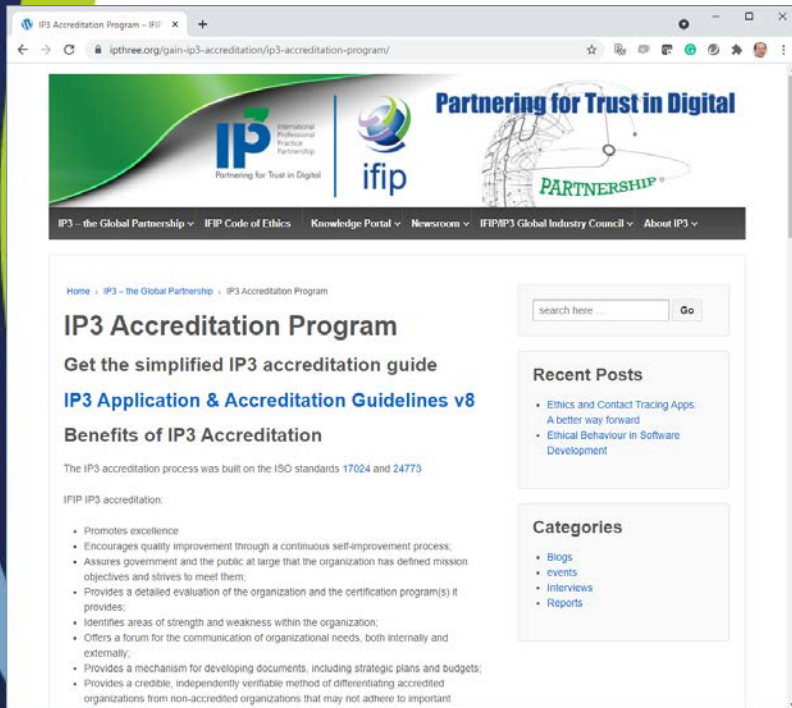




# Entire Picture of Related Activities and Organizations



IFIP IP3



The Institute of Professional Engineers, Japan

ACM Data Science Curriculum

Edison Data Science Framework

Data Scientist Association

CITP Certification

Data Scientist Certification

Data Science Curriculum

ISO/IEC JTC1/SC7/WG20

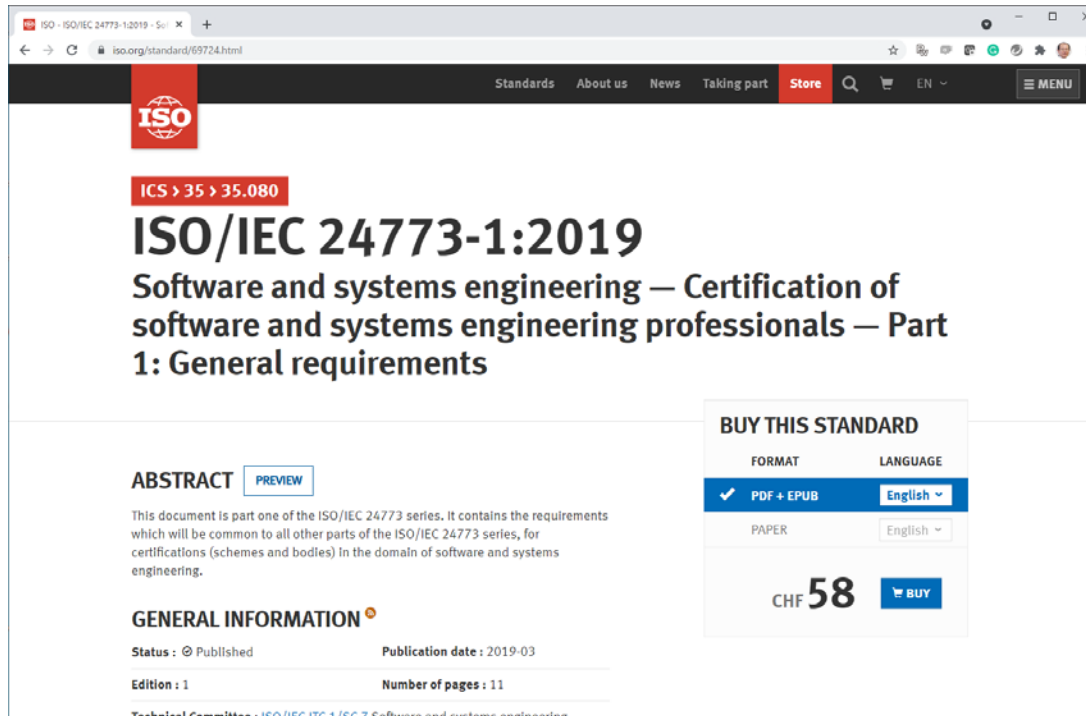
IP3



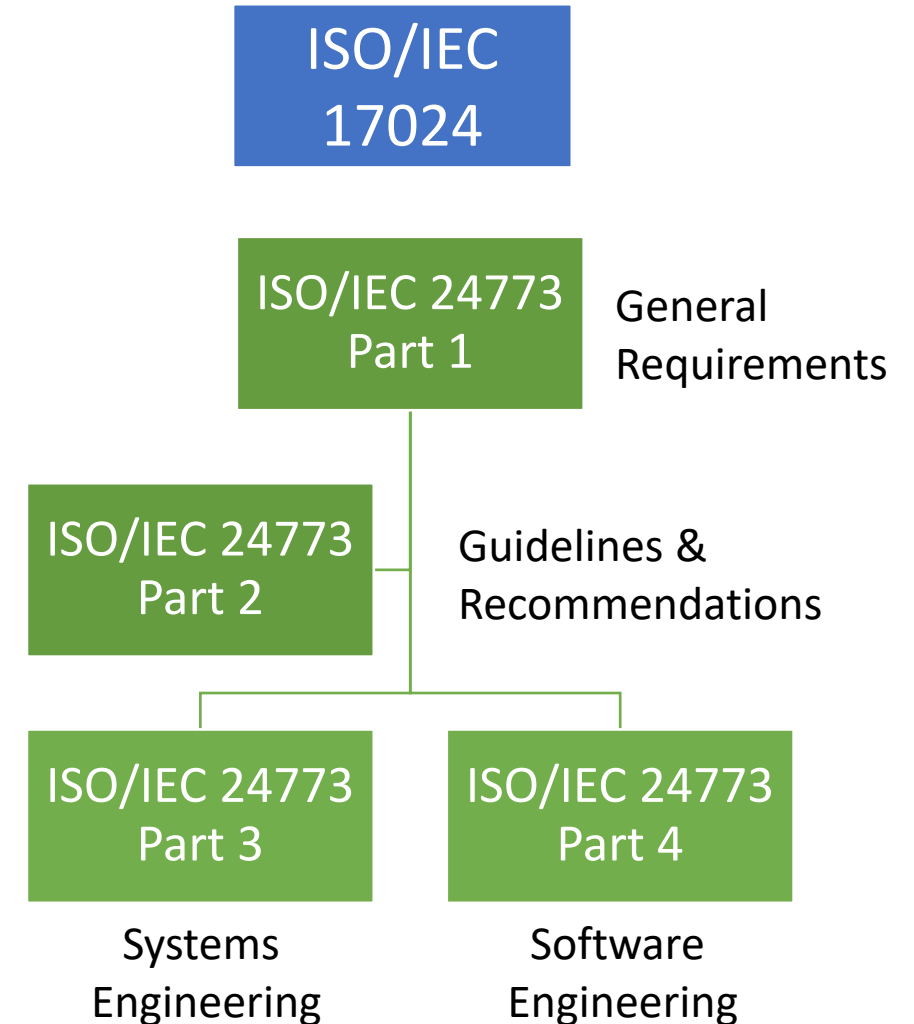
# ISO/IEC JTC1/SC7/WG20



Generic Requirements  
for Certification



- Defines requirements to certification scheme for software engineering and systems engineering professionals
- First ISO conformance standard to define requirements for IT-related certification





# Topic 2: Future plan of IPSJ related to DS education and DS certifications

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# IPSJ Data Science Strategy



## Concept

IPSJ will establish a framework for systematic education and certification for advanced IT professionals and contribute to the data-driven society.

## Plan

Build a systematic education/evaluation framework for Data Scientists from elementary school students to specialized IT engineers

Promote inter-university collaboration and sharing of educational contents related to Data Science curriculum standards (University specialized education level)

Promote utilization and cooperation of related existing activities

Promote mutual learning of the Data Scientists and social contribution based on engineer ethics including data utilization



# IPSJ Data Science Framework

