



ITU Kaleidoscope 2014

Living in a converged world - impossible without standards?

Syllabuses Crawling and Knowledge Extraction of Courses for Global Standardization Education

**Hiroshi Nakanishi
Osaka University**

nakanishi@idiscp.osaka-u.ac.jp

**Saint Petersburg,
Russian Federation**

Table of Contents

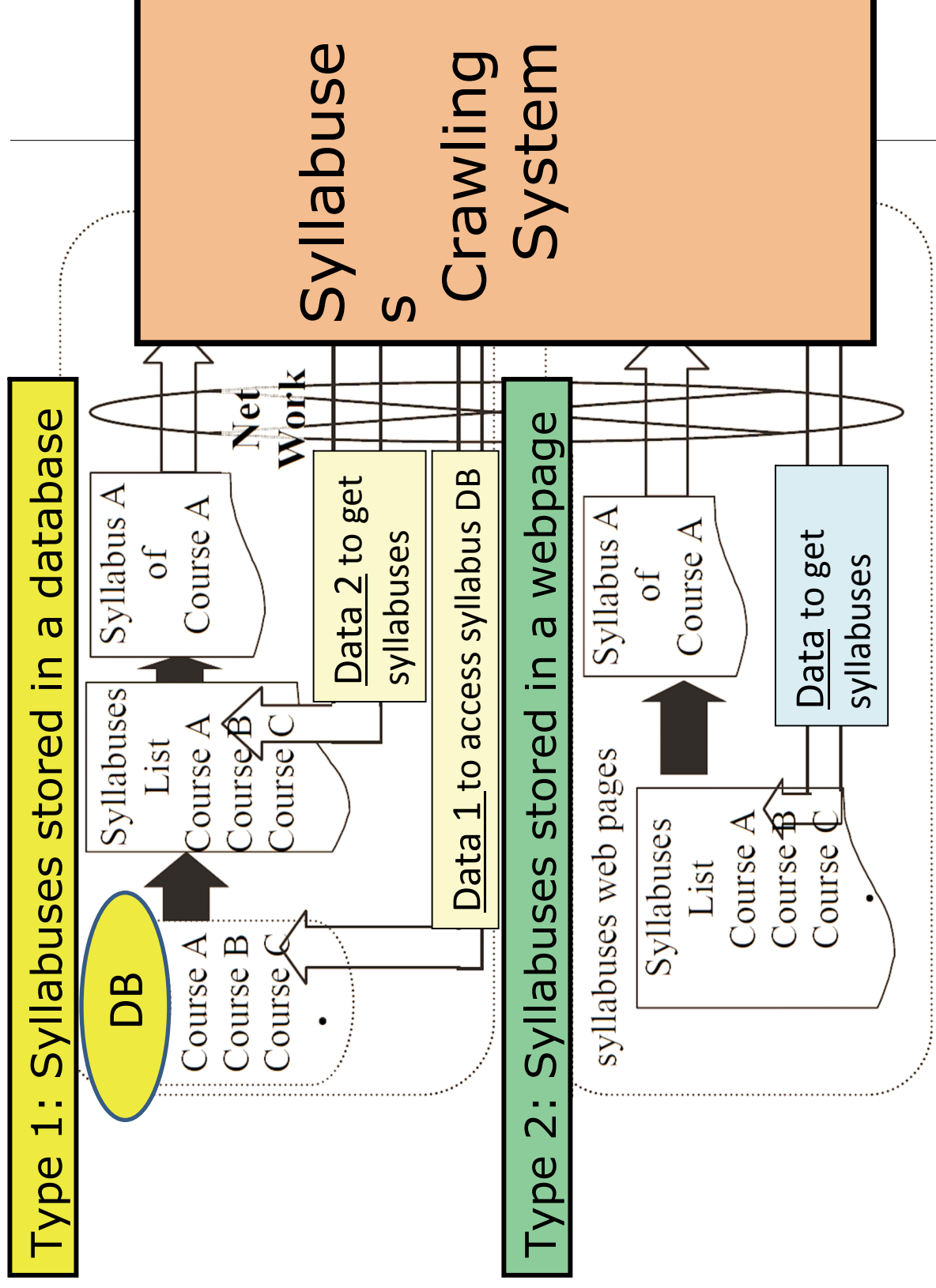
1. Objectives of this research
2. System design of syllabuses crawling and knowledge extraction
3. Results of syllabuses crawling and knowledge extraction
4. Conclusion

1. Objectives of this research

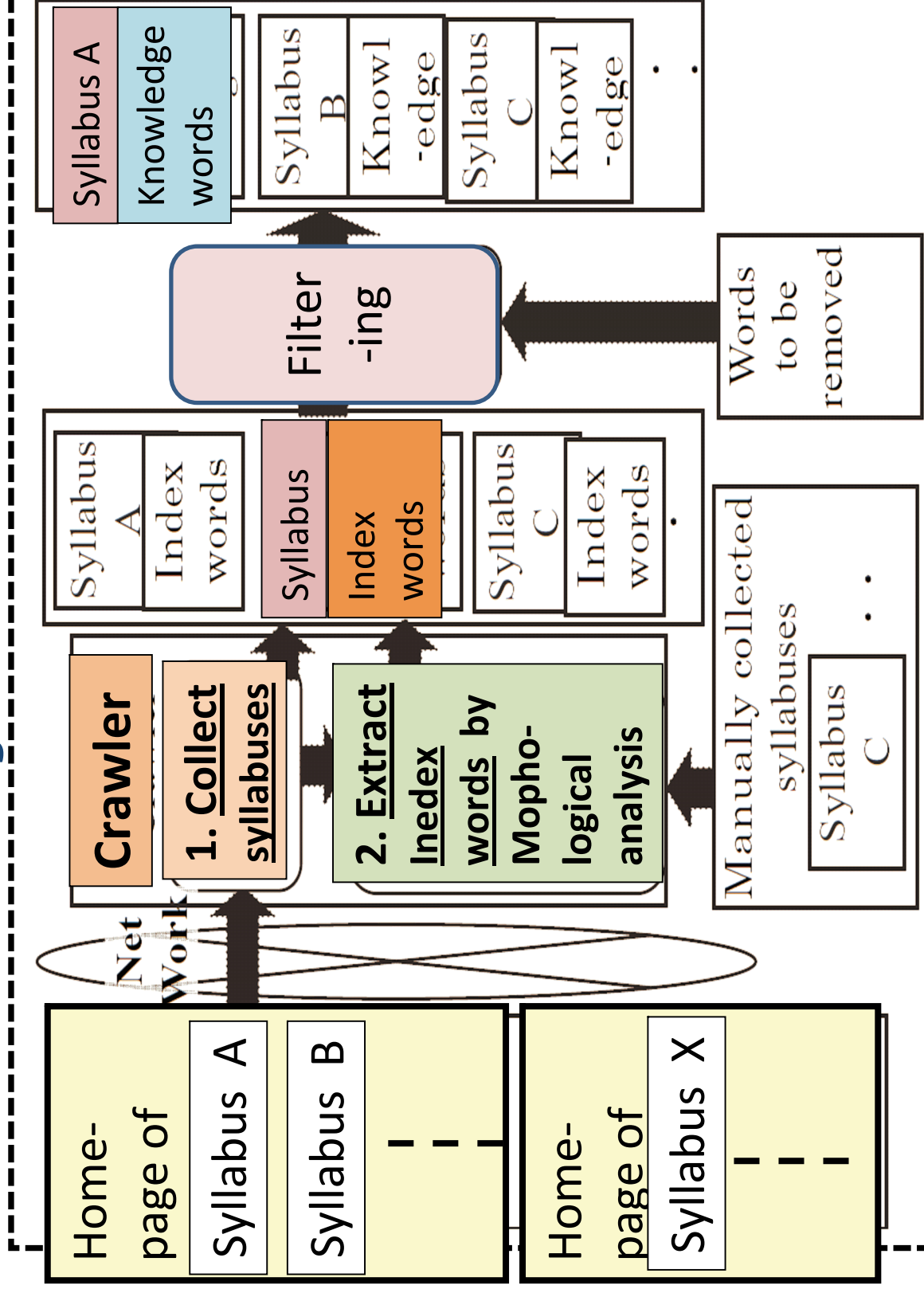
“To collect courses for the education about global standardization in universities” ,

1. Technologies for syllabuses crawling and knowledge extraction are made clear.
2. Results of the syllabuses crawling and knowledge extraction are described.

Fig.1 Two different types of syllabuses filing



2. System design for syllabuses crawling and their knowledge extraction.

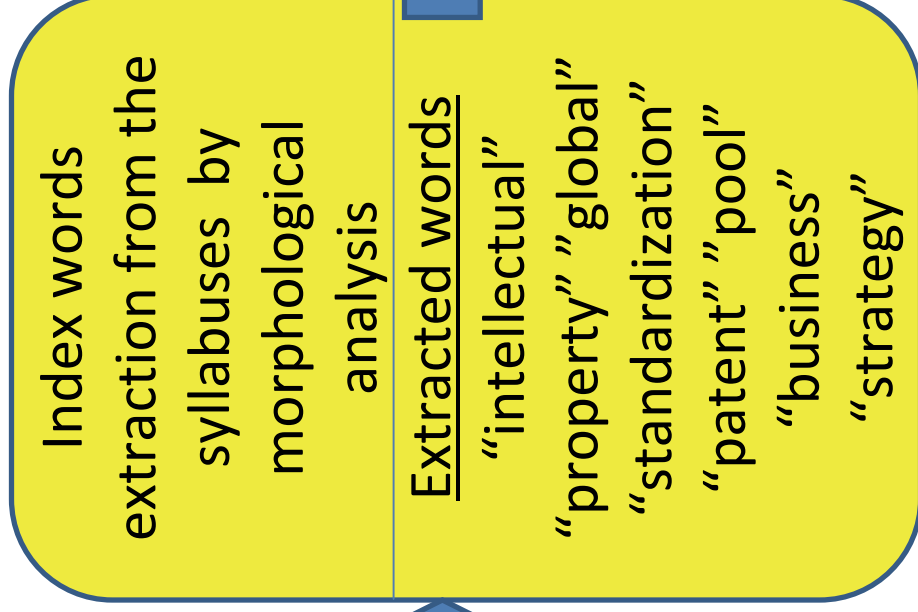


Flow of syllabuses crawling and knowledge extraction

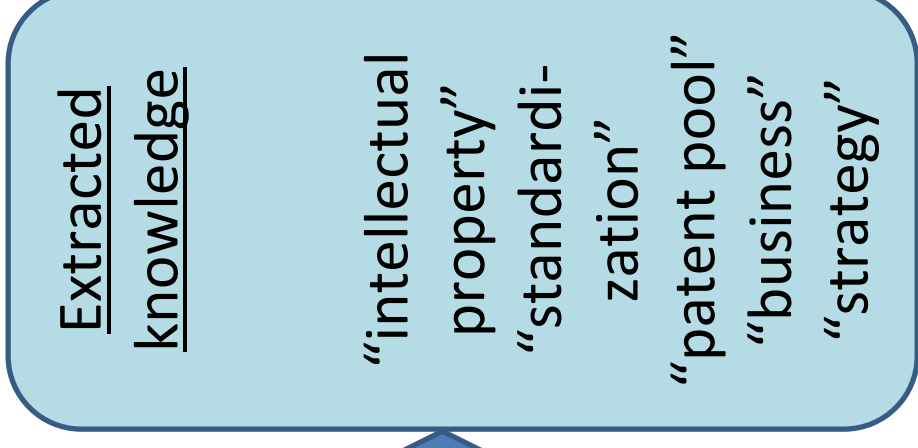
Syllabus (Course Outline)

Course Name: Global Standardization
Learning outcomes 1. Intellectual property - 2. Global standardization -
Weekly lecture plan 1. Intellectual property - 2. Global standardization - 3. Patent pool 15. Business strategy

Crawler



Filter



3. Execution of syllabuses crawling and knowledge extraction from homepages of universities

1. Prior to syllabuses crawling by the system, data sets required for crawling were obtained by accessing manually to the homepages of universities.
2. Syllabuses of 132 universities were crawled. (88 national universities+44 other universities)
3. By searching the crawled syllabuses, 45 courses about standardization were found.
4. Knowledge contained in each of the course was extracted and compared with each other.

Table 1 Number of Global standardization courses of universities in Japan

Number of universities	Number of courses	
	Graduate	Under graduate
24	40	5

Table 2 Knowledge classification of courses about global standardization

Knowledge (Large classification)	Knowledge (Middle classification)	Number of Courses
Standardization	Meaning and Organization	44
	Procedure for standardization	14
	Policy of standardization	9
	Human resources	4
Intellectual Property	Intellectual property system	25
	Patent pool	7
	Strategic Management	8
	Negotiation	9
Research and Development	Communication ability	6
	Innovation	18
	Research and development / Strategies	12
	Business model	31
Business	Business competitiveness?	17

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	Osaka					OIT
	Business standard-ization	Intellectual property	Knowledge value society	Topics in Technology	Negotiation	
Included knowledge	Graduate					Graduate
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14	○				○
Standardization policy	9	○				
Human resource quality	4	○				
IPR / patent system	25	○	○			○
Patent pool	7	○				○
Management of IPR /strategy	8	○	○			
Negotiation	9				○	
Communication skills	6				○	
Innovation	18		○		○	○
Research & development /strategy	12			○	○	
Business model	31	○	○	○	○	○
Intl. business competitiveness	17	○	○	○	○	

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	SIT		NAIST	JAIST	Tokyo	
	Global standard-ization	Tech-nology standard-ization			Innovation and IPR	Standard-ization and ICT
Included knowledge	Graduate		Graduate	Graduate	Graduate	
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14	○	○			
Standardization policy	9					
Human resource quality	4					
IPR / patent system	25	○		○	○	○
Patent pool	7					
Management of IPR /strategy	8				○	
Negotiation	9					○
Communication skills	6					
Innovation	18	○			○	
Research & development /strategy	12		○	○	○	○
Business model	31	○		○	○	○
Intl. business competitiveness	17	○		○	○	○

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	Doshisha	Akita	TMU	AiIT	UEC
Subj. (abbrev.)	IPR policy	Topics in Standardization	Elements of mechanism	Standardization for IPR	Negotiation for science & tech.
Included knowledge	Graduate	Graduate	Undergrad	Graduate	Graduate
Meaning and Institutes of STD	44 ○	○	○	○	○
Proc. for formulation of intl. spec	14	○		○	
Standardization policy	9				
Human resource quality	4				
IPR / patent system	25 ○			○	
Patent pool	7				
Management of IPR /strategy	8			○	
Negotiation	9				○
Communication skills	6				○
Innovation	18 ○				○
Research & development /strategy	12 ○				○
Business model	31				
Intl. business competitiveness	17			○	

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	Kyushu		KIT (1/2)			
	Global standard-ization	Tech. manage-ment & standad-ization	Global standard-ization	Practical tasks for standard-ization	Negotia-tion	Inter-national negotia-tion
Included knowledge	Graduate		Graduate			
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14					
Standardization policy	9	○	○			
Human resource quality	4			○		
IPR / patent system	25	○	○	○		
Patent pool	7	○		○		
Management of IPR /strategy	8			○		
Negotiation	9				○	○
Communication skills	6				○	○
Innovation	18	○	○			
Research & development /strategy	12	○	○			
Business model	31	○	○	○	○	○
Intl. business competitiveness	17			○		

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	KIT (2/2)			Chiba	Chubu	
	Tech- nology standard- ization	Technolo- gy stand- ardization policy	Communi- cation stand- ardization		Manage- ment for environ- ment	Environ- mental man- agement
Included knowledge		Graduate		Undergrad	Undergrad	
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14	○		○	○	○
Standardization policy	9	○				
Human resource quality	4			○	○	
IPR / patent system	25	○				
Patent pool	7	○				
Management of IPR /strategy	8					
Negotiation	9					
Communication skills	6					
Innovation	18	○	○			○
Research & development /strategy	12		○			
Business model	31	○	○		○	
Intl. business competitiveness	17				○	○

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	Titech				Tuat	TUS
	Standard-ization policy	Standard-ization	Tech-nology standard-ization I	Tech-nology standard-ization II		
Included knowledge		Graduate			Graduate	Graduate
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14					
Standardization policy	9	○				○
Human resource quality	4					
IPR / patent system	25		○		○	○
Patent pool	7					
Management of IPR /strategy	8					
Negotiation	9	○				
Communication skills	6					
Innovation	18		○	○	○	
Research & development /strategy	12					
Business model	31	○	○	○	○	○
Intl. business competitiveness	17		○		○	

Appendix Table1 Knowledge extraction from the 45 syllabuses

Univ. (abbrev.)	Akita P.	Kokushi	Waseda			Undergrad
			Company and standard-ization	Communi-cation and standard-ization	Technolo-gy standard	
Subj. (abbrev.)	Topics in Standard-ization	Global standard-ization	Company and standard-ization	Communi-cation and standard-ization	Technolo-gy standard	IPR man-agement
Included knowledge	Graduate	Graduate	Graduate			
Meaning and Institutes of STD	44	○	○	○	○	○
Proc. for formulation of intl. spec	14	○	○	○		
Standardization policy	9	○	○			
Human resource quality	4					
IPR / patent system	25	○	○	○	○	○
Patent pool	7		○			
Management of IPR /strategy	8		○			○
Negotiation	9				○	
Communication skills	6			○		
Innovation	18				○	
Research & development /strategy	12					
Business model	31		○	○	○	○
Intl. business competitiveness	17		○		○	

Appendix Table1 Knowledge extraction from the 45 syllabuses

Included knowledge	Univ. (abbrev.)	K.G.	Yamana	GRIPS
	Subj. (abbrev.)	Standard-ization management	Global Standard-ization	IPR policy
Meaning and Institutes of STD	44	○	○	
Proc. for formulation of intl. spec	14			
Standardization policy	9			
Human resource quality	4			
IPR / patent system	25	○		○
Patent pool	7			
Management of IPR /strategy	8			○
Negotiation	9	○		
Communication skills	6			
Innovation	18			
Research & development /strategy	12		○	
Business model	31	○	○	
Intl. business competitiveness	17	○		○

3. knowledge classification of the courses about global standardization

- 44 courses offer common knowledge, and various kinds of knowledge.
- Knowledge in relation to “meaning and institutes of global standardization”, “intellectual property and patent system” and “business model” is offered by more than one half of the courses.

4. Conclusion

1. Survey results on current education about global standardization in Japan were described.
2. Technology and design of syllabuses crawling and knowledge extraction were proposed.
3. 132 syllabuses were crawled from Japanese universities.
4. 45 courses about global standardization were searched from 132 syllabuses crawled.
5. Knowledge of each of the courses was classified into 13 kinds and compared.