

M.Sc. Information Systems

Study Start Winter Term 2023/2024

WISO
Fakultät
Faculty of Management, Economics and Social Sciences



What is the Root Metaphor of the Digital Age?

Agricultural Age: Farm



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Industrial Age: Factory / Industrial Production



<https://pixabay.com/en/woudagemaal-lemmer-ijsmeer-3773314/>

Originator: algria
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Digital Age: ???



<https://pixabay.com/en/network-earth-block-chain-globe-3537401/>

Originator: geralt
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Based on Berente (2020). Agile Development as the Root Metaphor for Strategy in Digital Innovation. In S. Nambisan, K. Lyytinen, Y. Yoo: *Handbook of Digital Innovation*. Edward Elgar Publishing.

What is the Fabric of the Digital Age?



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Accessed 2022-03-03
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Generate a Python Method that reads a CSV into a Pandas dataframe and only extracts those columns that only contain strings.

```
python Copy code  
  
import pandas as pd  
  
def extract_string_only_columns(csv_path):  
    # Read the CSV file into a DataFrame  
    df = pd.read_csv(csv_path)  
  
    # Initialize a DataFrame to hold only those columns with all string data  
    string_only_columns = pd.DataFrame()  
  
    # Iterate through each column to check if all elements are strings  
    for column in df.columns:  
        if df[column].apply(lambda x: isinstance(x, str)).all():  
            string_only_columns[column] = df[column]  
  
    return string_only_columns  
  
# Example usage  
csv_path = "your_file.csv" # Replace this with the path to your actual CSV  
result_df = extract_string_only_columns(csv_path)  
print(result_df)
```


Binary Representation

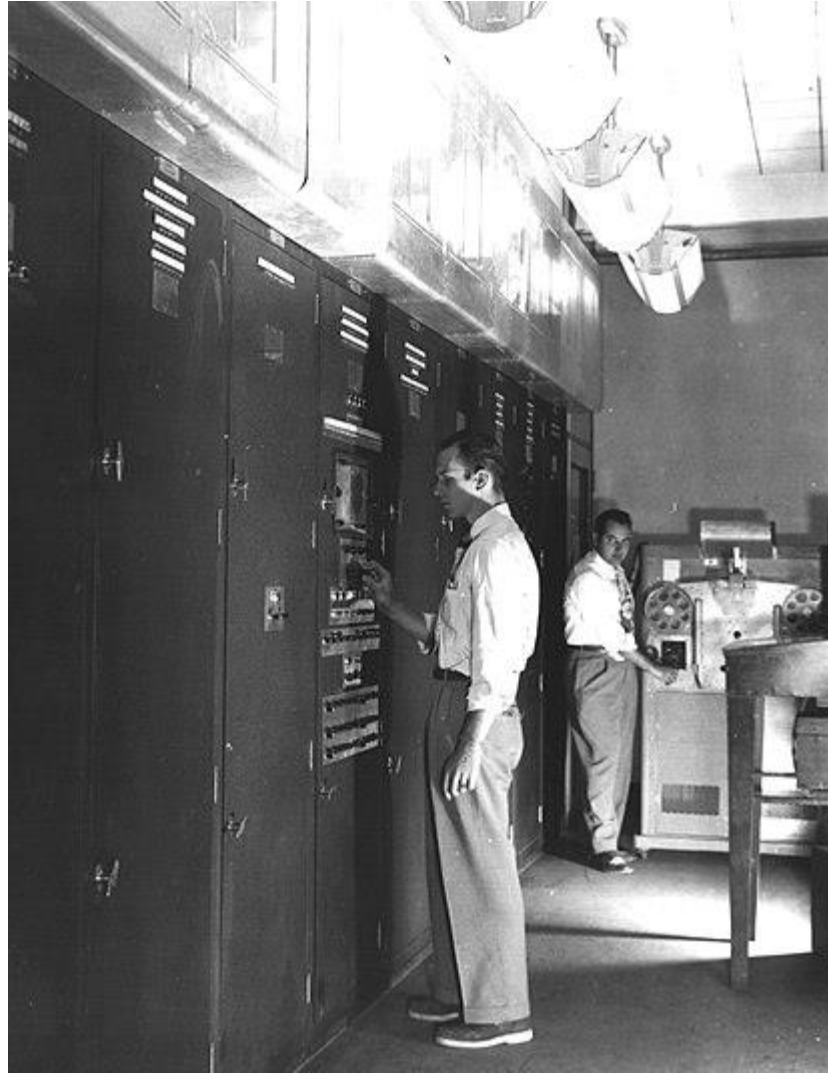
- » Homogenization of data through binary representation
- » Flexibility through most basic form of symbolic representation



Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). Research commentary—the new organizing logic of digital innovation: an agenda for information systems research. *Information systems research*, 21(4), 724-735.

<https://pixabay.com/en/monitor-binary-binary-system-1307227/>

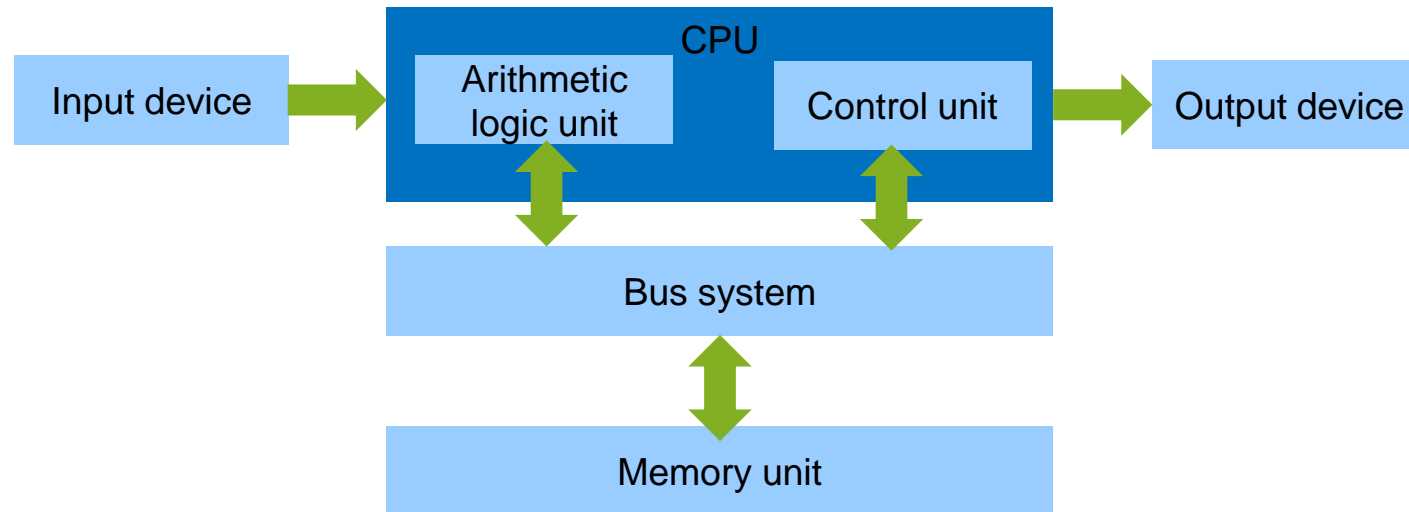
Originator: geralt
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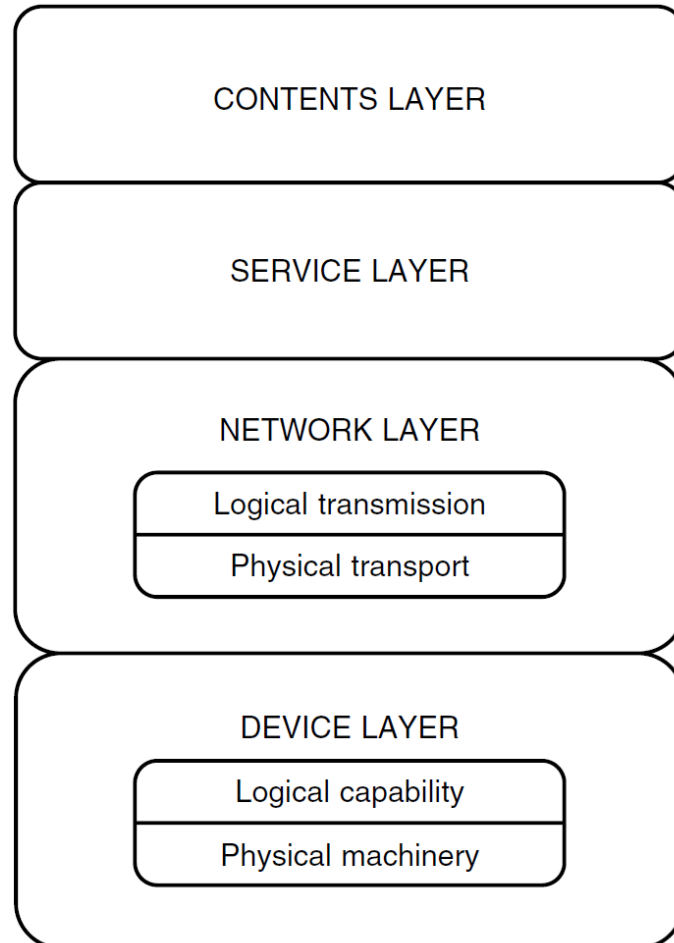
See page for author, Public domain, via
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Von Neumann Architecture

- Both data and program code in one memory unit
- Allows for reprogrammability



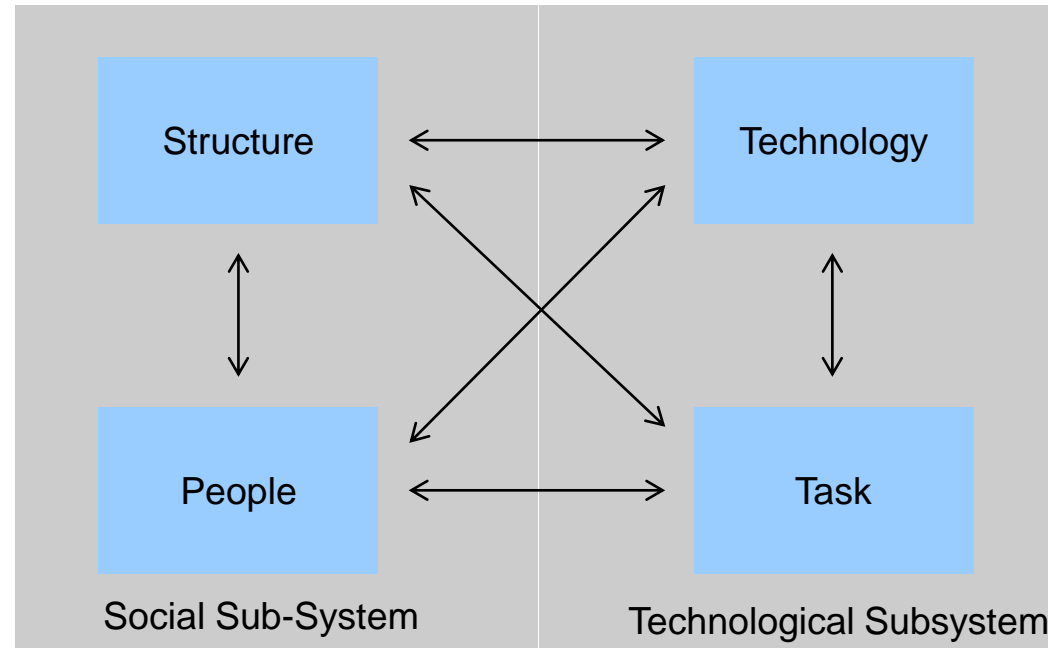
Layered Modular Architectures



- » Separation of **device** und **service**: reprogrammability
- » Separation of **networks** und **contents**: homogenization of data
- » Design decisions related to one layer can be independent of design decisions related to other layers
- » Foundation for combinatorial innovation and generativity

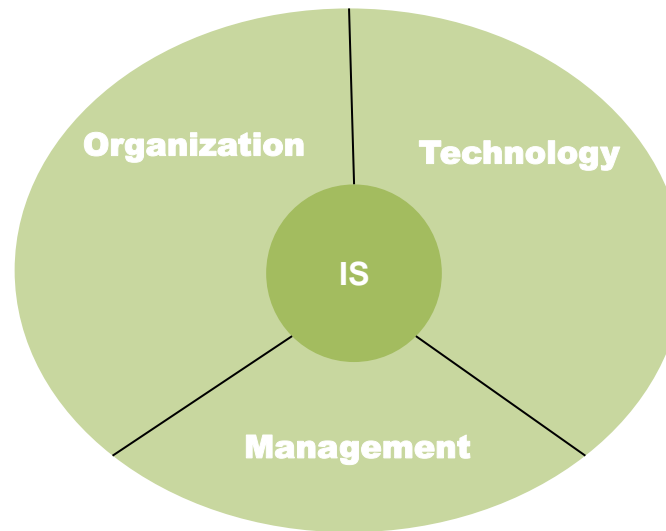
Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). Research commentary—the new organizing logic of digital innovation: an agenda for information systems research. *Information systems research*, 21(4), 724-735.

A Foundational Idea: Socio-technical Systems



Based on Bostrom, R. P., & Heinen, J. S. (1977). MIS problems and failures: A socio-technical perspective. Part I: The causes. MIS quarterly, 17-32.

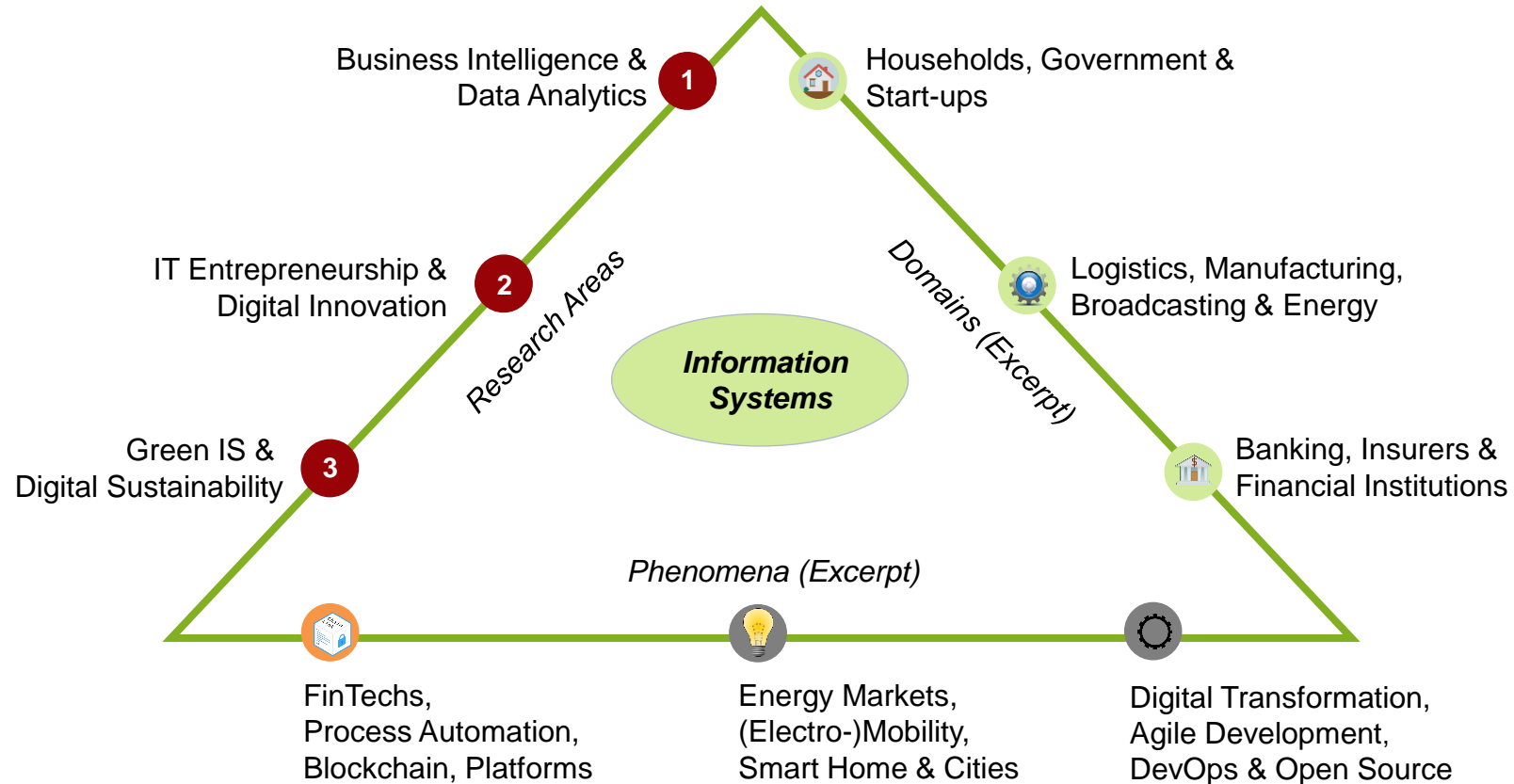
Perspectives and Interests



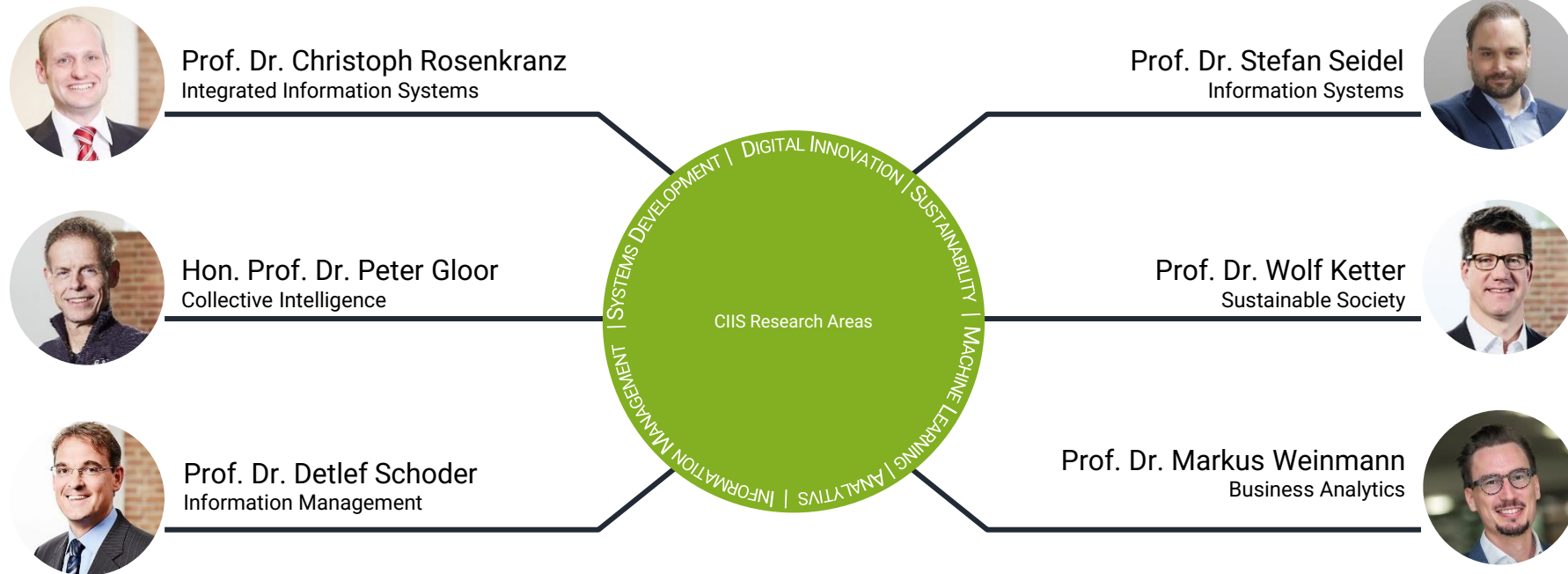
Laudon, K. C., Laudon, J. P., Schoder, D. (2010).
Wirtschaftsinformatik – Eine Einführung (2. Auflage).
Pearson: München, Deutschland.

Our Approach: The CIIS

Cologne Institute for Information Systems (CIIS)

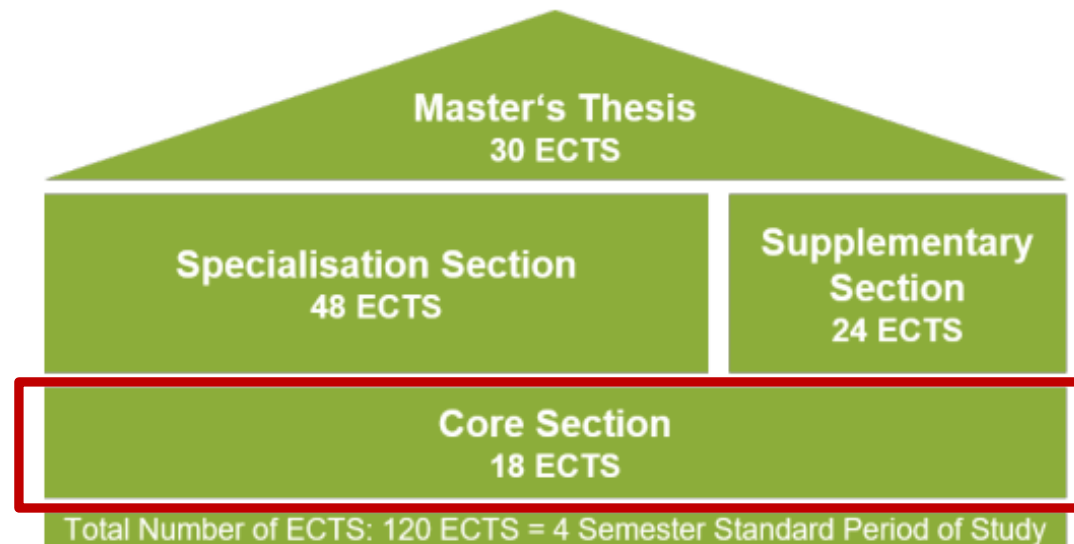


Professors and Groups



M.Sc. Information Systems

Information Systems



Core Section Information Systems

Group	Module	ECTS	CC/ EC	Required ECTS
Core Section Information Systems	CM Information Systems I	6	CC	18
	CM Information Systems II	6	CC	
	CM Digital Transformation	6	CC	

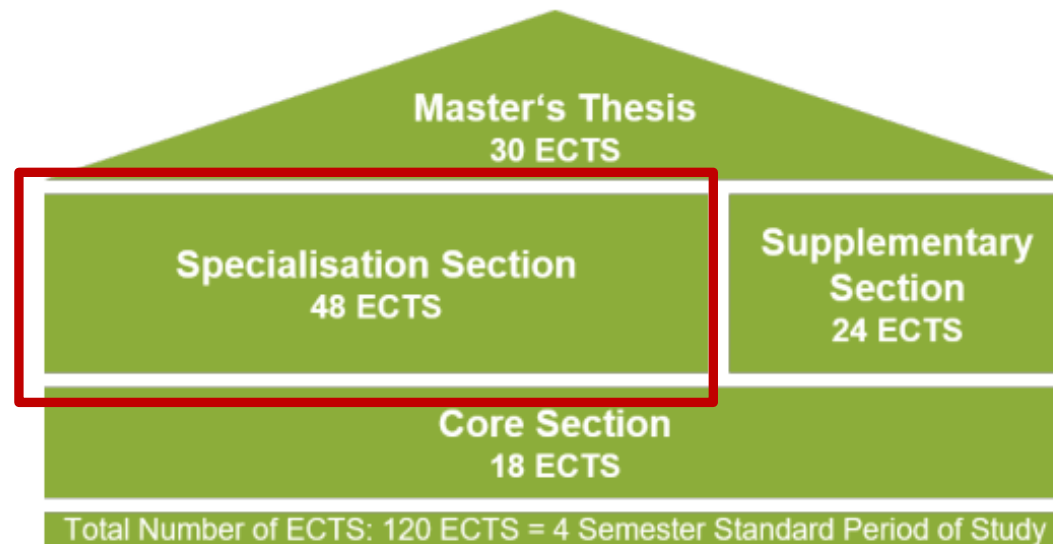
- **CM IS I - Information Systems and Environmental Sustainability**
- **CM IS II – Analytics and Applications**
- **CM Digital Transformation - Digital Transformation and Innovation**

Example: CM Information Systems I

CM Information Systems I					
Module Code	Workload	ECTS Credits	Module Language	Module Availability	Duration
1277MBISY1	180h	6	English	every 2nd term - winter term	1 Term
1	Courses Information Systems and Environmental Sustainability		Contact Hours 60h	Self-Studies 120h	Course Language English
2	Module Content <ul style="list-style-type: none"> • Forms and types of sustainability • Key sustainability indicators • Green IT • Green IS • Transformation potential of information systems for organizational sustainability • Sustainable development of information systems • Sustainable use of information systems • Sustainable management of information systems 				
3	Learning Objectives Students... ... understand methods and theories in the area of sustainable development, use and management of information systems. ... analyse current questions and challenges in the area of organisational sustainability. ... justify and defend (independently developed) positions or problem solutions. ... act responsibly considering ecological, social and ethical criteria. ... critically evaluate current social developments and develop alternative solutions.				
4	Teaching and Learning Methods lecture practice				
5	Module Entry Requirements none				
6	Mode of End-Of-Module Examination Written test: WT (90)				
7	Prerequisites for Awarding of Credit Points Passing the module examination				
8	Other Programmes that Use the Module Master of Science Business Administration - Supply Chain Management: Supplementary Section Supply Chain Management Master of Science Business Administration - Finance: Supplementary Section Finance Master of Science Business Administration - Accounting and Taxation: Supplementary Section Accounting and Taxation Master of Science Business Administration - Corporate Development:				

	Supplementary Section Corporate Development Master of Science Economics: Supplementary Section Management & Social Sciences Master of Arts Medienwissenschaft: Ergänzungsbereich Medienmanagement und Medienökonomie Master of Science International Management: Supplementary Section International Management Master of Education Wirtschaftspädagogik/Lehramt an Berufskollegs: Ergänzungsbereich Wirtschaftspädagogik Master of Science Information Systems: Core Section Information Systems
9	Module Manager N. N.
10	Miscellaneous There may be case studies and exercises to be prepared in groups and presented by the students in class. The solutions presented will be analysed and discussed. Students will be advised of compulsory reading on a term-by-term basis.

Information Systems



Group	Module	ECTS	CC/ EC	Required ECTS	
Information System	SpM Information Systems I	6	EC	18	48
	SpM Information Systems II	6	EC		
	SpM Information Systems III	6	EC		
	Studies Abroad in Information Systems	6	EC		
Computer Science	SpM Computer Science I	9	CC	18	
	SpM Computer Science II	9	CC		
Seminar	SpM Seminar Information Systems I	6	CC	12	
	SpM Seminar Information Systems II	6	CC		

The course contents of the individual modules can all be found in the module manual:

https://wiso.uni-koeln.de/sites/fakultaet/dokumente/downloads/MHB_Archiv/Studienjahr_22-23/MHB_PO2021/m_mhb_po2021_e_is.pdf

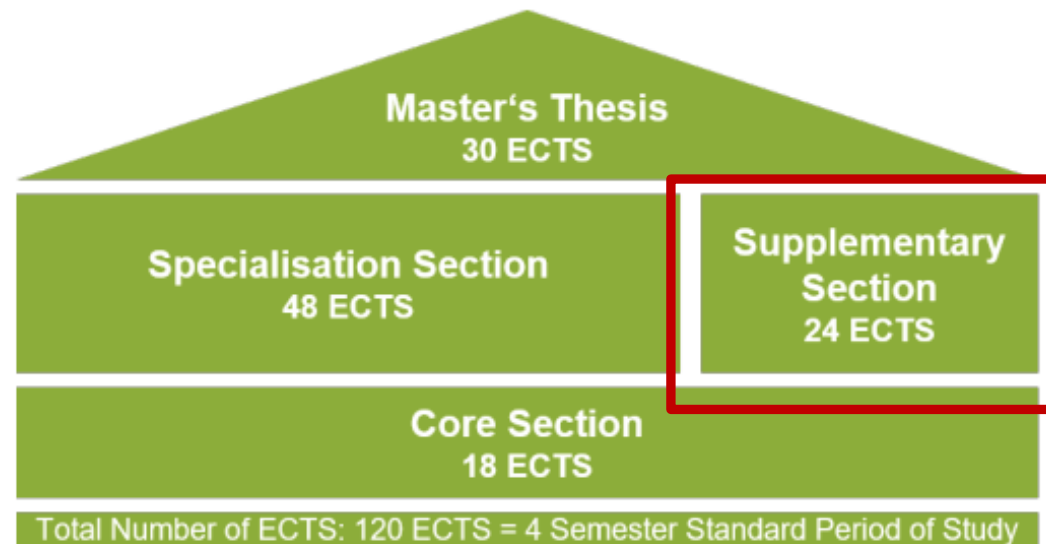
Information Systems Courses

Modul	Course	ECTS
Specialization Section Information Systems I	Advanced Analytics and Applications	6
	Sustainable Digital Innovation Lab	
	Case Project Digital Transformation	
Specialization Section Information Systems II	Emerging Electronic Business	6
	Business Intelligence and Data Management	
	IT Entrepreneurship	
	Bayesian Data Analytics	
Specialization Section Information Systems III	Artificial Intelligence and Information Management	6
	Applied Mathematical Optimization	
	Machine Learning and Artificial Intelligence	
	Decision Making under Uncertainty	
Studies Abroad in Information Systems	Depends on host university	6
Specialization Section Computer Science I	Computer Science I (see KLIPS)	9
Specialization Section Computer Science II	Computer Science II (see KLIPS)	9
Specialization Section Seminar Information Systems I	Various Advanced Seminars (next slide)	6
Specialization Section Seminar Information Systems II	Various Advanced Seminars (next slide)	6

Sample Seminars

Modul	Seminar
Specialization Section Seminar Information Systems I	Advanced Seminar Collaborative Innovation Networks
	Advanced Seminar Information Systems for Sustainable Society
	Advanced Seminar Integrated Information Systems
	Advanced Seminar Information Management
Specialization Section Seminar Information Systems II	Advanced Seminar Information Management
	Advanced Seminar Digital Transformation and Value Creation
	Advanced Seminar Next Generation Information Systems
	Advanced Seminar Integrated Information Systems
	Advanced Seminar Information Systems and Digital Technology

Information Systems



Group	Module	ECTS	CC/ EC	Required ECTS
Accounting and Taxation	SpM Controlling I	6	EC	24
	SpM Controlling II	6	EC	
	SpM Accounting I	6	EC	
	SpM Taxation I	6	EC	
	SpM Advanced Accounting	6	EC	
	SpM Accounting & Taxation Seminar	6	EC	
	SpM Selected Issues in Accounting & Taxation I	6	EC	
Corporate Development	SpM Business Ethics	6	EC	24
	SpM Strategic Development	6	EC	
	SpM Strategic Human Resource Management	6	EC	
	SpM Strategic Management	6	EC	
	SpM Elective Corporate Development I	6	EC	
	SpM Elective Corporate Development II	6	EC	
	SpM Elective Corporate Development III	6	EC	
Finance	SpM Finance I	6	CC	24
	SpM Finance II	6	CC	
	SpM Finance III	6	CC	
	SpM Finance Advanced IV	6	CC	
Marketing	SpM Brand Management	6	CC	24
	SpM Customer Management	6	CC	
	SpM Marketing Performance Management	6	CC	
	SpM Digital Strategy and Marketing	6	CC	

Supply Chain Management	CM Supply Chain Analytics I	6	CC	24
	CM Supply Chain Analytics II	6	EC	
	SpM Supply Chain Operations	6	CC	
	SpM Supply Chain Strategy	6	EC	
	SpM Supply Chain Planning	6	EC	
	SpM Selected Issues in Behavioural Supply Chain Management	6	EC	
Economics for Business Administration	SpM Empirical Methods and Data Analysis I	6	EC	24
	SpM Empirical Methods and Data Analysis II	6	EC	
	SpM Empirical Methods and Data Analysis III	6	EC	
	SpM Empirical Methods and Data Analysis IV	6	EC	
	SpM Empirical Methods and Data Analysis V	6	EC	
	SpM Market Design and Behaviour I	6	EC	
	SpM Market Design and Behaviour II	6	EC	
	SpM Market Design and Behaviour V	6	EC	
	SpM Markets and Economic Policy I	6	EC	
	SpM Markets and Economic Policy II	6	EC	
	SpM Markets and Economic Policy III	6	EC	
	SpM Markets and Economic Policy IV	6	EC	
	SuM Energy and Climate Change I	6	EC	
	SuM Energy and Climate Change II	6	EC	
	SuM Energy and Climate Change III	6	EC	
	SuM Energy and Climate Change IV	6	EC	
	CM Macroeconomics	6	EC	
	CM Selected Methods in Economics	6	EC	
	SpM Media Economics	6	EC	
	CM Applied Econometrics (Business Administration)	6	EC	

	CM Microeconomics (Business Administration)	6	EC	
	CM Mathematics	6	EC	
Media and Technology Management	SuM Media and Technology Management - Enterprises, Markets, and Strategies	6	EC	24
	SuM Media and Technology Management - Selected Issues I	6	EC	
	SuM Media and Technology Management - Selected Issues II	6	EC	
	SpM Media Economics	6	EC	
	SpM Media and Technology Management - Research and Publications	6	EC	
	SpM Seminar Media Economics	6	EC	
Political Science	CM Comparative Political Institutions	6	EC	24
	CM Comparative Political Economy	6	EC	
	CM Democratic Theory and Practice	6	EC	
	CM International Relations	6	EC	
	CM European Politics	6	EC	
	SpM Special Topics Political Science I	6	EC	
	SpM Special Topics Political Science I	6	EC	
Sociology	CM Sociology I: Analysis of Cross-Sectional Data	12	CC	24
	CM Sociology II: Sociological Theory	6	CC	
	CM Sociology III: Contemporary Societies: Social Structure and Social Change	6	CC	

Tax Law	SpM Selected Issues in Accounting & Taxation I	6	EC	24
	SpM Selected Issues in Accounting & Taxation II	6	EC	
	CM Basic Course Tax Law	6	EC	
	CM European Tax Law	6	EC	
	CM Specialisation in Company Law	6	EC	
	CM Income Tax Law	6	EC	
	CM Indirect Taxation Law	6	EC	
	CM Corporate Tax Law	6	EC	
	CM International Tax Law	6	EC	
	CM Selected Issues of Tax Law	6	EC	
Economic Psychology	SuM Introduction to Economic Psychology	12	CC	24
	SuM Advanced Economic Psychology I	6	CC	
	SuM Advanced Economic Psychology II	6	CC	
Business Analytics & Econometrics	CM Data Analytics I	6	EC	24
	CM Data Analytics III	6	EC	
	CM Data Analytics V	6	EC	
	CM Data Analytics II	6	EC	
	CM Data Analytics IV	6	EC	
Studies Abroad	Studies Abroad I	6	EC	24
	Studies Abroad II	6	EC	
	Studies Abroad III	6	EC	
	Studies Abroad IV	6	EC	

Study Progress Recommendation

1. Semester	<p>Core Module Information Systems I CC 1277MBISY1 6 CP</p>	<p>Core Module Information Systems II CC 1277MBISY2 6 CP</p>	<p>Core Module Digital Transformation CC 1277MBDTF1 6 CP</p>	<p>Specialisation Module Computer Science (1/2) CC 5722MSCSC1 9 CP</p>	<p>Supplementary Module (1/4) EC 6 CP</p>	33
2. Semester	<p>Specialisation Module Information Systems (1/3) EC 6 CP</p>	<p>Specialisation Module Information Systems (2/3) EC 6 CP</p>	<p>Specialisation Seminar Information Systems I CC 1277MSSIS1 6 CP</p>	<p>Specialisation Module Computer Science (2/2) CC 5722MSCSC2 9 CP</p>	<p>Supplementary Module (2/4) EC 6 CP</p>	33
3. Semester	<p>Specialisation Module Information Systems (3/3) EC 6 CP</p>		<p>Specialisation Seminar Information Systems II CC 1277MSSIS2 6 CP</p>	<p>Supplementary Module (3/4) EC 6 CP</p>	<p>Supplementary Module (4/4) EC 6 CP</p>	24
4. Semester	<p>Master Thesis Information Systems CC 1277MMISY1 30 CP</p>					30

Sections Core Specialisation Supplementary

Study Progress Recommendation

M.Sc. Programme Information Systems (with study abroad option)						
1. Semester	<p>Core Module Information Systems I CC 1277MBISY1 6 CP</p>	<p>Core Module Information Systems II CC 1277MBISY2 6 CP</p>	<p>Core Module Digital Transformation CC 1277MBDTF1 6 CP</p>	<p>Specialisation Module Computer Science (1/2) CC 5722MSCSC1 9 CP</p>	<p>Specialisation Module Information Systems (1/3) EC 6 CP</p>	33 CP
2. Semester		<p>Specialisation Seminar Information Systems I CC 1277MSSIS1 6 CP</p>	<p>Specialisation Seminar Information Systems II CC 1277MSSIS2 6 CP</p>	<p>Specialisation Module Computer Science (2/2) CC 5722MSCSC2 9 CP</p>	<p>Specialisation Module Information Systems (2/3) EC 6 CP</p>	27 CP
3. Semester semester abroad	<p>Supplementary Section Studies Abroad EC 24CP</p>				<p>Specialisation Module Information Systems Studies Abroad (3/3) EC 6 CP</p>	30 CP
4. Semester	<p>Master Thesis Information Systems CC 1277MMISY1 30 CP</p>					30 CP
	Sections	Core	Specialisation	Supplementary		

Study Progress Recommendation

M.Sc. Information Systems – Business Intelligence and Data Science						
1. Semester	<p>Core Module Information Systems I</p> <p>CC 1277MBISY1 6 CP</p>	<p>Core Module Information Systems II</p> <p>CC 1277MBISY2 6 CP</p>	<p>Core Module Digital Transformation</p> <p>CC 1277MBDTF1 6 CP</p>	<p>Specialisation Section Informatik Module (1/2)</p> <p>CC 5722MSCSC1 9 CP</p>	<p>Supplementary Section Economics (SM Empirical Methods & Data Analysis I-V)</p> <p>EC 6 CP</p>	<p>CP</p> <p>33</p>
2. Semester	<p>Specialisation Module Information Systems II (Business Intelligence)</p> <p>EC 1277MSISY2 6 CP</p>	<p>Specialisation Module Information Systems III (Adv. Inform. Management with Artificial Intelligence)</p> <p>EC 1277MSISY3 6 CP</p>	<p>Seminar Information Systems I (Inform. Management oder Collaborative Innovation Networks)</p> <p>CC 1277MSSIS1 6 CP</p>	<p>Specialisation Section Informatik Module (2/2)</p> <p>CC 5722MSCSC2 9 CP</p>	<p>Supplementary Section Economics (SM Empirical Methods & Data Analysis I-V)</p> <p>EC 6 CP</p>	<p>33</p>
3. Semester	<p>Specialisation Module Information Systems I (Advanced Analytics and Applications)</p> <p>EC 1277MSISY1 6 CP</p>		<p>Seminar Information Systems II (Collaborative Innovation Networks oder Inform. Management)</p> <p>CC 277MSSIS2 6 CP</p>	<p>Supplementary Section Economics (SM Empirical Methods & Data Analysis I-V)</p> <p>EC 6 CP</p>	<p>Supplementary Section Economics (SM Empirical Methods & Data Analysis I-V)</p> <p>EC 6 CP</p>	<p>24</p>
4. Semester	<p>Master Thesis Information Systems</p> <p>CC 1277MMISY1 30 CP</p>				<p>30</p>	

Sections Core Specialisation Supplementary

Study Progress Recommendation

M.Sc. Information Systems – Digital Innovation and Entrepreneurship						
1. Semester	Core Module Information Systems I CC 1277MBISY1 6 CP	Core Module Information Systems II CC 1277MBISY2 6 CP	Core Module Digital Transformation CC 1277MBDTF1 6 CP	Specialisation Section Informatik Module (1/2) CC 5722MSCSC1 9 CP	Supplementary Section Corporate Development (1/4) EC 6 CP	33 CP
2. Semester	Specialisation Module Information Systems II (IT Entrepreneurship) EC 1277MSISY2 6 CP	Specialisation Module Information Systems III (Artificial Intelligence & Inform. Management) EC 1277MSISY3 6 CP	Seminar Information Systems I (Information Systems and Digital Technology oder Inform. Management) CC 1277MSSIS1 6 CP	Specialisation Section Informatik Module (2/2) CC 5722MSCSC2 9 CP	Supplementary Section Corporate Development (2/4) EC 6 CP	33 CP
3. Semester	Specialisation Module Information Systems I (Digital Strategy and Transformation) EC 1277MSISY1 6 CP		Seminar Information Systems II (Collab. Innovation Networks oder Inform. Systems for Sust. Society oder Inform. Management) CC 1277MSSIS2 6 CP	Supplementary Section Corporate Development (3/4) EC 6 CP	Supplementary Section Corporate Development (4/4) EC 6 CP	24 CP
4. Semester	Master Thesis Information Systems CC 1277MMISY1				30 CP	30 CP

Sections Core Specialisation Supplementary

Study Progress Recommendation

M.Sc. Information Systems – Digital Sustainable Society						
1. Semester	<p>Core Module Information Systems I</p> <p>CC 1277MBISY1 6 CP</p>	<p>Core Module Information Systems II</p> <p>CC 1277MBISY2 6 CP</p>	<p>Core Module Digital Transformation</p> <p>CC 1277MBDTF1 6 CP</p>	<p>Specialisation Section Informatik Module (1/2)</p> <p>CC 5722MSCSC1 9 CP</p>	<p>Supplementary Section Economics (Energy Economics 1/4)</p> <p>EC 6 CP</p>	33 CP
2. Semester	<p>Specialisation Module Information Systems II (IT Entrepreneurship)</p> <p>EC 1277MSISY2 6 CP</p>	<p>Seminar Information Systems I (Collaborative Innovation Networks)</p> <p>CC 1277MSSIS1 6 CP</p>	<p>Specialisation Section Informatik Module (2/2)</p> <p>CC 5722MSCSC2 9 CP</p>	<p>Supplementary Section Economics (Energy Economics 2/4)</p> <p>EC 6 CP</p>	<p>Supplementary Section Economics (Energy Economics 3/4)</p> <p>EC 6 CP</p>	33 CP
3. Semester	<p>Specialisation Module Information Systems I (Sustainable Digital Innovation Lab)</p> <p>EC 1277MSISY1 6 CP</p>	<p>Specialisation Module Information Systems III (Adv. Topics in Inf. Systems for Sust. Society)</p> <p>EC 1277MSISY3 6 CP</p>	<p>Seminar Information Systems II (Information Systems for Sustainable Society)</p> <p>CC 1277MSSIS2 6 CP</p>		<p>Supplementary Section Economics (Energy Economics 4/4)</p> <p>EC 6 CP</p>	24 CP
4. Semester	<p>Master Thesis Information Systems</p> <p>CC 1277MMISY1</p>				30 CP	30 CP

Sections Core Specialisation Supplementary

Questions?



Alternative: WiSo Student Service Point (WiSSPo)
<https://wiso.uni-koeln.de/en/studies/service-and-guidance/wiso-student-service-point/>

Good Luck with Your Studies!

