

Course title: DESIGN THINKING IN DIGITAL TRANSFORMATION

Lecturers	Assoc. Prof. Igor Pihir, Ph.D. Full. Prof. Nina Begičević, Ph.D. Ana Kutnjak, M. Econ. Asst. Prof. Nikola Kadoić, Ph.D. Barbara Šlibar, M.Inf. Full Prof. Stjepan Vidačić, Ph.D.
Language of instruction	Croatian and English
Study level	Bachelor
Study programme	Information and Business Systems
Semester	5 th (winter)
ECTS	6
Goal	<p>The objective of the course is to acquaint the students with contemporary concepts of systems and design thinking with the aim of defining complex business problems and identifying ways of solving them, structured innovation process, and ultimately deciding on particular scenarios or variants of complex business problems in the context of digital transformation.</p> <p>Acquiring knowledge about digital transformation, implementation methods, trends and influence on the application of technological concepts in the improvement and transformation of business in order to achieve business goals and realize business concepts.</p> <p>Adopting the generic concept of system, systems thinking and systems approach as a methodology and tools that enable identification, analysis and problem solving in complex systems.</p> <p>Adopting a Design Thinking Method for the purpose of a structured, user-oriented process of innovating and creating added value for customers or users by enhancing the process or product in the context of digital transformation.</p> <p>Introduction to decision making processes in the context of digital transformation, and with the problems and challenges that can occur. Also, students will be acquainted with specific decision-making methods and they will be able to apply them for making a decision within the problem-solving process.</p>
General and specific learning outcomes	<p>Keep track of professional literature in Croatian and a foreign language, prepare and independently deliver presentations in Croatian and a foreign language to professional and general public, and critically evaluate a presented professional topic.</p> <p>Understand and apply study skills needed for lifelong learning and continuation of education at the graduate level.</p> <p>Successfully communicate with clients, users and colleagues in speaking and writing using appropriate terminology, including the ability to communicate about one's professional field of discipline in a foreign language.</p>

Content	<p>1. Introduction to the course (2 hours)</p> <p>Defining basic concepts: digital transformation; business processes; business process modelling; business decision making, the link between decision making and digital transformation. Trends in digital transformation. Levels of automation and levels of computerization. Models of information and business system.</p> <p>2. Business concepts of the organization (2 hours)</p> <p>Business system, organization and its environment. Objectives of the organization. System approach and system thinking. System, elements, structure and function. System principles. Business concepts in digital transformation of an organization. Purpose, goals, business process, product, improvement of business process and restructuring of business technology (business process reengineering).</p> <p>3. Technology concepts of the organization (4 hours)</p> <p>Existing technologies and prevailing technological solutions (ERP; CRM; Cloud technologies; Mobile technology; Reference models; Supply Chain Management; Data Warehouses; Business Process Management and Organizational Performance Measurement). New technologies and new technological solutions (Social networks; Digital Platforms; Artificial Intelligence; Metamodels; Knowledge Management; Robotics and Autonomous Systems, etc.).</p> <p>4. System and Design Thinking (4 hours)</p> <p>System definition, problem definition, domain definition. Design Thinking process. Concepts of innovation and innovation process. System and design potential for transformation. Design thinking process and method.</p> <p>5. Design Thinking process (4 hours)</p> <p>Stages of the Design Thinking process. Methods and tools for implementing Design Thinking. Visualization; mapping user journeys (experiences); value chain analysis; mental maps; storm of ideas; concept development; testing assumptions; rapid prototyping; development in collaboration with the user; test launch. Defining the future state and developing scenarios (alternatives) that can be achieved through digital transformation.</p> <p>6. Digital Transformation Impact Assessment (4 hours)</p> <p>Sorts and types of digital transformation effects. Develop scenarios and assess impact for their implementation. Risk assessment and calculation of return on investment methods. Scoring and evaluation of alternatives. Business planning and strategic decision making. Business Planning Methods. Business planning approaches and systems. Project cost-effectiveness methods. NPV. IRR. Return on investment period.</p> <p>7. Decision making and Digital transformation (2 hours)</p> <p>Decision making. Phases of decision making. Business decision making. An introduction to decision making methods. A framework for supporting digital transformation. Impacts of digital transformation. The link between decision making and digital transformation.</p> <p>8. The impact of technological trends on decision analysis in agile organizations (2 hours)</p> <p>The impact of Industry 4.0 on business decision making in agile organizations. Decision making myths in agile organizations. Formation of a data-driven organization. Data-driven decision making.</p>
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	<p>9. Review of decision-making methods. Simple methods for decision making under conditions of uncertainty and risk (2 hours)</p> <p>Uncertainty in decision making. Rules for making decisions based on attitude to unknown; with a pessimistic attitude, with an optimistic attitude, a coefficient of optimism, minimizing regret. An Introduction to the Decision Tree. Introduction to the Risk Matrix. Introduction to sensitivity analysis.</p> <p>10. Identifying and structuring decision-making problems (4 hours)</p> <p>Identifying decision making problems, Structuring decision-making problems: criteria, sub-criteria, alternatives. Phases of the decision making. Analytic Hierarchy Process (AHP). Hierarchical structure of decision problems. Pairwise comparison. The Eigenvalue method. Axioms of the AHP. Advantages and disadvantages of the AHP. Inconsistency analysis in the AHP. Group decision making by the AHP.</p> <p>11. Decision making using the Analytic Hierarchy Process (AHP) (2 hours)</p> <p>Identifying and structuring a specific decision-making problem from the ICT domain and digital transformation. Choosing a decision maker and applying the AHP in the decision-making process. Application of the AHP to determine the weights of the criteria and priorities of the alternatives. Sensitivity analysis. BOCR (Benefits, Opportunities, Costs, Risks) hierarchical models.</p>
Exercises	Students solve problems and discuss examples connected to particular lectures in real-life independent assignments combined together into the student team project. Every unit of lectures is accompanied by seminars, enabling the students to apply the acquired knowledge on practical examples and present their ideas through team projects.
Realization and examination	<p>Preliminary exams. Additional activities are conducted within the class. Those activities will be evaluated. Class attendance. Student project.</p> <p>If students' responsibilities will not be solved by up mentioned activities, they will have a final exam in form of the written and oral exam?</p>
Related courses	
Literature	<p>Basic:</p> <p>Westerman, G., Bonnet, D., McAfee, A. (2014). Leading Digital – turning technology into business transformation. USA: Harvard business review press.</p> <p>Rob Dekkers (2017) Applied Systems Theory, 2nd Edition, Springer.</p> <p>Antoljak, V. (2018). Design Thinking za nedizajnere : kako riješiti poslovne probleme i uspješno inovirati. Zagreb: Školska knjiga.</p> <p>Sikavica, Hunjak, Begičević Ređep, Hernaus. (2014). Poslovno odlučivanje. Školska knjiga.</p> <p>Power D.J., Heavin C. (2018). Data-based Decision Making and Digital Transformation. Business Experts Press.</p> <p>Additional:</p> <p>Gharajedaghi. J. (2006). Sytem Thinking – Managing Chaos and Complexity – A Platform for Designing Business Arhitecture. 2nd Edition. Butterworth-Heinemann / Elsevier.</p>

	<p>Checkland, P. & Poulter, J. (2006). Learning for Action – A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students. John Wiley & Sons. (2006)</p> <p>Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A. (2014). Value proposition design, Hoboken, New Jersey: John Wiley & Sons</p> <p>Albright, Winston. (2015). Data Analysis and Decision Making. Cengage Learning.</p> <p>Sauter. (2011). Decision Support Systems for Business Intelligence. Wiley.</p>
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