University of South Florida
Muma College of Business
School of Information Systems and Management
ISM 7930 – Design Science Research (DSR) Seminar
Fall 2023

Instructor:	Alan R. Hevner	*E-Mail:*	ahevner@usf.edu
Term:	Fall Semester 2022	*Dates and Time:*	8/23/2023-12/6/2023
Delivery Method:	In Class Wednesday 2 – 4:45pm	*Location:*	CIS 2074
Course Technical Prerequisites	*In order to take courses online at USF, you will need to be able to demonstrate proficiency at basic computer skills, maintain reliable internet access, and meet the computer system requirements listed at:* https://www.usf.edu/it/remote/requirements-for-students		
Office Hours:	Instructor – Wednesday, 5-6pm in CIS 2076 or on Teams as needed		

I. Instructor Contact Information and Communication

The preferred method of instructor contact is via ahevner@usf.edu . You may address the instructor as Prof. Hevner.

II. First Week Attendance Policy

First week attendance will be taken during the first class on August 23. If you are not marked present in first week attendance you will be dropped from the class.

III. University Course Description

Design Science Research (DSR) is a problem-solving paradigm that seeks to enhance human knowledge via the creation of innovative artifacts. Simply stated, DSR seeks to enhance technology and science knowledge bases via the creation of innovative artifacts that solve problems and improve the environment in which they are instantiated. The results of DSR include both the newly designed artifacts and a fuller understanding (e.g. design theories) of why the artifacts provide an enhancement (or, disruption) to the relevant application contexts. DSR is a prominent form of Engaged Scholarship in which multiple key stakeholders (researchers, users, clients, sponsors, and practitioners) collaborate to understand and address an important, complex problem/opportunity.

IV. Course Purpose

The goal of this course is to instruct you in the performance of design science research projects. Upon completion of the course, you will be able to integrate DSR methods and contributions into your research projects and publications in top business journals and conferences.

V. Course Structure

This course is structured as weekly modules in Canvas. The content of each module is specified in the course Syllabus. Assignments and grading criteria are provided in the Canvas assignments.

VI. Course Objectives

Upon completion of this course, students will:

- Understand the basic concepts and definitions used in design science research.
- Know the academic literature in DSR.
- Analyze complex application problem spaces.
- Creatively design solutions to interesting problems and opportunities.
- Evaluate the impacts of the new solutions in the application context.
- Make research contributions in the appropriate knowledge bases.
- Make practice contributions to solving real-world problems.
- Be able to publish high impact DSR in top ranked academic journals.

VII. Student Learning Outcomes

Upon completion of this course, students will be able to:

- Master the essential DSR Proficiencies
- Apply agile and disciplined methods in the use of design science research.
- Understand the different types of artifacts produced by DSR.
- Build and evaluation artifacts to solve real-world problems.
- Determine the goals of a DSR projects and how to evaluate the satisfaction of those goals via evaluation criteria.
- Understand the different process models for performing DSR, including Action Design Research.
- Understand and develop design theories to generalize new knowledge in the application field.
- Understand the importance of creativity in DSR – cognitive behaviors in humans.
- Understand the importance of collaboration in DSR – social behaviors in humans.
- Publish rigorous research papers using DSR methods.

VIII. Required Course Materials

- No Textbooks are required

IX. Recommended Texts

- A. Hevner and S. Chatterjee, *Design Research in Information Systems: Theory and Practice*, Integrated Series in Information Systems, Vol. 22, Springer, New York, 2010.
- J. vom Brocke, A. Hevner, and A. Maedche, Editors, *Design Science Research. Cases*, Springer Nature, 2020.

X. Basis for Final Grade

The Plus/Minus grading system will be used in this course. Grading is on the curve and no set grading scale is used.

Class Participation	20%
Proficiency Assignments and Mid-Term Presentation	40%
Final Paper	40%

XI. Assignments

Proficiency drafts will be the product of weekly class discussions during the first 8 weeks of the course. Students will collaboratively discuss and propose a research outline for investigating selected DSR application topics. For the Mid-Term presentation, each student will finalize a selection of a DSR application domain and present a research proposal that demonstrates the DSR proficiencies in that domain. Research questions will be identified for the final semester paper. For the Final paper, each student will complete and present a final paper for submission to a conference. Complete details of these assignments are in Canvas.

XII. Course Schedule*

Week# and Class Date	**Topic**	**Readings**
Week 1 August 23 Module 1	Introduction to Course – *Syllabus* – *Assignments* – *Class Participation* Design Science Research Foundations – DSR Basics – Research Challenges and DSR Proficiencies	1-3
Week 2 August 30 Module 2	Student Introduction Presentations – Background and Research Interests – Exemplar DSR Paper of Interest (Post in Canvas) – Discussion of DSR Application Discipline Interests	TBD
Week 3 September 6 Module 3	Representing the Problem Space (Proficiency 1) – The Challenge of Complexity – Socio-Technical Information Systems – System Goals and Evaluation Criteria – Fitness-Utility Models of DSR	4-7
Week 4 September 13 Module 4	Capturing Extant Knowledge in the Solution Space (Proficiency 2) – DSR Externalities – Literature Review in Application Domain – Knowledge Bases (Descriptive and Prescriptive)	8-10

Week 5 September 20 Module 5	Controlling the DSR Process (Proficiency P3) – The Challenge of Control – DSR Process Models – Action Design Research and the Elaborated ADR – Managed Evolution Channel	11-15
Week 6 September 27 Module 6	Building Innovative Design Artifacts (Proficiency P4) – The Challenge of Creativity – Creative and Collaborative Teams – Digital Innovation	16-20
Week 7 October 4 Module 7	Performing Rigorous Evaluation (Proficiency P5) – The Challenge of Confidence – Evaluation Methods (Formative and Summative) – Interior and Exterior Evaluations	22-25
Week 8 October 11 Module 8	Contributing to Science and Practice (Proficiency P6) – The Challenge of DSR Contributions and Impacts – Innovative Artifacts – Design Theories – Knowledge Accumulation and Evolution	26-29
Week 9 October 18 Module 9	Mid-Term Student Presentations – Research Paper Proposal – Targeted Research Conference – Discussion and Feedback	
Weeks 10-13 October 25 – November 15 Modules 10-13	DSR Application Domains to be determined by student interests. Potential Research Topics: – Data Science – Artificial Intelligence (AI) – Human Computer Interaction (HCI) – Cybersecurity – NeuroIS – Others	TBD
Week 14 November 22	No Class – Thanksgiving Break	
Week 15 November 29	Final Student Presentations – Discussion and Feedback – Final Research Papers due December 6	

Please refer to the Course Modules and Assignments within Canvas for important deadlines and a listing of what topics will be covered.

* Course schedule and topics are subject to change.

XIII. **Readings**

The all readings will be downloads available on Canvas. Students may identify additional relevant materials to bring into the classroom discussion. All readings are to be completed by class on the date assigned.

1. A. Hevner, S. March, J. Park, and S. Ram, "Design Science Research in Information Systems," *Management Information Systems Quarterly*, Vol. 28, No. 1, March 2004, pp. 75-105.
2. S. Gregor and A. Hevner, "Positioning and Presenting Design Science Research for Maximum Impact," *Management Information Systems Quarterly*, Vol. 37, No. 2, June 2013, pp. 337-355.
3. A. Hevner and J. vom Brocke, "A Proficiency Model for Design Science Research Education," *Journal of Information Systems Education*, (34:3), Summer 2023, pp. 264-278.
4. A. Hevner, "Intellectual Control of Complexity in Design Science Research," in A. Rai, Editor's Comments: Diversity of Design Science Research. *Management Information Systems Quarterly* (41:1), 2017, pp. iii-xviii.
5. S. Sarker, S. Chatterjee, X. Xiao, and A. Elbanna, "The Sociotechnical Axis of Cohesion for the IS Discipline: Its Historical Legacy and Its Continued Relevance," *MIS Quarterly* (43:3), 2019, pp. 695-719.
6. T.G. Gill and A. Hevner, "A Fitness-Utility Model for Design Science Research," *ACM Transactions on Management Information Systems*, Vol. 4, No. 2, Article 5, August 2013, 24 pages.
7. A. Hevner, N. Prat, I. Comyn-Wattiau, and J. Akoka, "A Pragmatic Approach for Identifying and Managing Design Science Research Goals and Evaluation Criteria," *Proceedings of the SigPrag Workshop*, San Francisco, 2018.
8. A. Dreschler and A. Hevner, "Knowledge Paths in Design Science Research," *Foundations and Trends in Information Systems*, (6:3), November 2022, pp. 171-243.
9. A. Hevner and V. Storey, "Externalities of Design Science Research: Preparation for Project Success," *Proceedings of the Design Science Research in Information Systems and Technology* (DESRIST 2021), Kristiansand, Norway, August 2021.
10. J. vom Brocke, A. Simons, K. Riemer, B. Niehaves, R. Plattfaut, and A. Cleven, "Standing on the Shoulders of Giants. Challenges and Recommendations of Literature Search in Information Systems Research," *Communications of the Association for Information Systems*, (37:1), 2015, pp. 205-224.
11. A. Hevner, "A Three Cycle View of Design Science Research," *Scandinavian Journal of Information Systems*, Vol. 19, No. 2, 2007, pp. 87-92.
12. K. Peffers, T. Tuunanen, M. Rothenberger, and S. Chatterjee, "A Design Science Research Methodology for Information Systems," *Journal of MIS* (24:3), 2007, pp. 45-77.
13. M. Sein, O. Henfridsson, S. Purao, M. Rossi, and R. Lindgren, "Action Design Research," *MIS Quarterly*, (35:1), 2011, pp. 37-56.
14. M. Mullarkey and A. Hevner, "An Elaborated Action Design Research Process Model," *European Journal of Information Systems* (28:1), 2019, pp. 6-20.
15. R. Winter and A. Hevner, "Negotiating the Research/Practice Interspace of Design Science

Research: Navigating Choppy Waters." White Paper, 2023.

16. T. Amabile, "Componential Theory of Creativity," *Encyclopedia of Management Theory* (Eric H. Kessler, Ed.), Sage Publications, 2013.
17. A. Hevner, C. Davis, R.W. Collins, and T.G. Gill, "A NeuroDesign Model for IS Research," *Informing Science: The International Journal of an Emerging Transdiscipline*, 17, 2014, pp. 103-132.
18. J. Weedman, "Client as designer in collaborative design science research projects: What does social science design theory tell us?" *European Journal of Information Systems*, 17:5, 2008, 476-488.
19. E. Arias, H. Eden, G. Fischer, A. Gorman, and E. Scharff, "Transcending the Individual Human Mind—Creating Shared Understanding through Collaborative Design," *ACM Transactions on Human-Computer Interaction* (7:1), March 2000, 84-113.
20. A. Hevner and S. Gregor, "Envisioning Entrepreneurship and Digital Innovation through a Design Science Research Lens: A Matrix Approach," *Information & Management*, (59:3), April 2022.
21. J. Venable, J. Pries-Heje, and R. Baskerville, "FEDS: A framework for evaluation in design science research," *European Journal Information Systems*, (25:1), 2016*,* 77-89.
22. N. Prat, I. Comyn-Wattiau, and J. Akoka, "A Taxonomy of Evaluation Methods for Information Systems Artifacts. *Journal of Management Information Systems*, 32(3), 2015, 229-267.
23. C. Sonnenberg and J. vom Brocke, "Evaluations in the science of the artificial - Reconsidering the build-evaluate pattern in design science research," In K. Peffers, M. Rothenberger, & B. Kuechler (Eds.), *Advances in Theory and Practice,* 2012*,* 381-397, Springer.
24. M. Adam, S. Gregor, A. Hevner, and S. Morana, "Design Science Research Modes in Human-Computer Interaction Projects," *AIS Transactions on Human-Computer Interaction*, 13(1), 2021, pp. 1-11.
25. M. Tremblay, A. Hevner, and D. Berndt, "Focus Groups for Artifact Refinement and Evaluation in Design Research," *Communications of the Association for Information Systems*, Vol. 26, Article 27, June 2010, pp. 599-618.
26. R. Baskerville, A. Baiyere, S. Gregor, A. Hevner, and M. Rossi, "Design Science Research Contributions: Finding a Balance between Artifact and Theory," *Journal of the Association for Information Systems* (19:5), Article 3, 2018.
27. S. Gregor and D. Jones, "The anatomy of a design theory," *Journal of the Association for Information Systems*, 8(5), 312-335.
28. J. vom Brocke, R. Winter, A. Hevner, and A. Maedche, "Special Issue Editorial – Accumulation and Evolution of Design C in Design Science Research: A Journey Through Time and Space," *Journal of the Association for Information Systems*, (21:3), Article 9, 2020.
29. S. Gregor, L. Chandra-Kruse, and S. Siedel, "Research Perspectives: The Anatomy of a Design Principle," Journal of the Association for Information Systems, (21:6), 2020, pp. 1622-1652.

XIV. Instructor Feedback Policy & Grade Dissemination

Instructor will respond to email communication relevant to the subject matter within 12 hours of the time received. Instructor will provide feedback on assignments within one week of the posted deadline. You can access your scores at any time using "Grades" in Canvas.

XV. Course Policies

Attendance Policy: Attendance is expected in a doctoral seminar. Students must take responsibility for full preparation and completion of all course requirements.

Incompletes: Only in rare cases, such as serious illness, will an Incomplete be given. An Incomplete must be requested in writing giving the reason for the request and all appropriate documentation. An Incomplete grade ("I") is exceptional and granted at the instructor's discretion only when students are unable to complete course requirements due to illness or other circumstances beyond their control. The course instructor and student must complete and sign the "I" Grade Contract Form that describes the work to be completed, the date it is due, and the grade the student would earn factoring in a zero for all incomplete assignments. The due date can be negotiated and extended by student/instructor as long as it does not exceed two semesters for undergraduate courses and one semester for graduate courses from the original date grades were due for that course. An "I" grade not cleared within the two semesters for undergraduate courses and one semester for graduate courses (including summer semester) will revert to the grade noted on the contract.

Synchronous Sessions: At the discretion of the instructor or TA, synchronous virtual sessions on Teams may be held. During such sessions, software may be used to record live class lectures and discussions. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. Students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Please discuss this option with your instructor.

XVI. USF Institutional Policies

Academic Integrity: The following USF policies cover student responsibilities and rights. For a complete list of USF System Regulations and University Policies: See https://www.usf.edu/regulations-policies/ Relevant Policies include:

- **Academic Integrity of Students**
- **Disruption of the Academic Process**
- **Student Academic Grievance Procedures**

USF Policy on University Closure: In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include but are not limited to: Canvas, Teams, and email messaging and/or an alternate schedule. It's the responsibility of the student to monitor the Canvas site for course specific communication, and the main USF, College, and department websites, emails, and MoBull messages for important general information.

Title IX Policy: Title IX provides federal protections for discrimination based on sex, which includes discrimination based on pregnancy, sexual harassment, and interpersonal violence. In an effort to provide support and equal access, **USF has designated all faculty (TA, Adjunct, etc.) as Responsible Employees, who are required to report any disclosures of sexual harassment, sexual violence, relationship violence or stalking.** The Title IX Office makes every effort, when safe to do so, to reach out and provide resources and accommodations, and to discuss possible options for resolution. Anyone wishing to make a Title IX report or seeking accommodations may do so online, in person, via phone, or email to the Title IX Office. For information about Title IX or for a full list of resources please visit: https://www.usf.edu/title-ix/gethelp/resources.aspx. *If you are unsure what to do, please contact Victim Advocacy – a confidential resource that can review all your options – at 813-974-5756 or va@admin.usf.edu.*

Campus Free Expression: It is fundamental to the University of South Florida's mission to support an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles, this course may involve discussion of ideas that you find uncomfortable, disagreeable, or even offensive. In the instructional setting, ideas are intended to be presented in an objective manner and not as an endorsement of what you should personally believe. Objective means that the idea(s) presented can be tested by critical peer review and rigorous debate, and that the idea(s) is supported by credible research. Not all ideas can be supported by objective methods or criteria. Regardless, you may decide that certain ideas are worthy of your personal belief. In this course, however, you may be asked to engage with complex ideas and to demonstrate an understanding of the ideas. Understanding an idea does not mean that you are required to believe it or agree with it.

XVII. **Student Expectations**

Course Hero / Chegg Policy: The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

End of Semester Student Evaluations: All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

Turnitin.com: In this course, turnitin.com may be utilized. Turnitin is an automated system which instructors may use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you will be expected to submit all assignments in both hard copy and electronic format. After the assignment is processed, as instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process visit http://www.turnitin.com. Essays are due at turnitin.com the same day as in class.

Netiquette Guidelines

1. Act professionally in the way you communicate. Treat your instructors and peers with respect, the same way you would do in a face-to-face environment. Respect other people's ideas and be constructive when explaining your views about points you may not agree with.
2. Be sensitive. Be respectful and sensitive when sharing your ideas and opinions. There will be people in your class with different linguistic backgrounds, political and religious beliefs or other general differences.
3. Proofread and check spelling. Doing this before sending an email or posting a thread on a discussion board will allow you to make sure your message is clear and thoughtful. Avoid the use of all capital letters, it can be perceived as if you are shouting, and it is more difficult to read.
4. Keep your communications focused and stay on topic. Complete your ideas before changing the subject. By keeping the message on focus you allow the readers to easily get your idea or answers they are looking for.
5. Be clear with your message. Avoid using humor or sarcasm. Since people can't see your expressions or hear your tone of voice, meaning can be misinterpreted.

Email and Discussion Board Guidelines:

1. Use the subject line effectively by using a meaningful line of what your email or discussion is about.
2. Keep your emails and postings related to the course content. You should not post anything personal on a discussion board, unless is requested by the instructor.
3. Any personal, course or confidential issues should be directly communicated to the instructor via email. The discussion boards are public spaces; therefore, any issues should not be posted there.

XVIII. Course Technology & Student Support

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.
SAS website for the Tampa and Sarasota-Manatee campuses.
SAS website for the St. Pete campus.

Academic Support Services
The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the Office of Student Success website.

Canvas Technical Support
If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the "Canvas Help" page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.
IT website for the Tampa campus.
IT website for the St. Pete campus.
IT website for the Sarasota-Manatee campus.

Center for Victim Advocacy
The Center for Victim Advocacy empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.

Counseling Center
The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training that enhances student academic and personal success. Contact information is available online.
Counseling Center website for the Tampa campus.
Counseling Center website for the St. Pete campus.
Counseling Center website for the Sarasota-Manatee campus.

Writing Studio
The Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, email writingstudio@usf.edu.
Writing studio website for the Tampa campus.
Writing studio website for the St. Pete campus.
Writing studio website for the Sarasota-Manatee campus.

XIX. **Important Dates to Remember**

University calendar dates are found at http://www.usf.edu/registrar/calendars/ .

All course dates are found on the course syllabus and in Canvas.