TECH 62100-44  
Fall 2016  
Research in Open Innovation (ROI)

Professor: Sabine Brunswicker  
Email: sbrunswi@purdue.edu  
Office: Young Hall, Room 305, Discovery Park Learning Center, Room 491  
Schedule: Class meets Thursday 4:30 to 7:20 pm, DLRC 143B (room opens at 4:15)  
Office Hours: Monday 2:00 – 3:00 pm (DLRC 491)  
Website: www.purdue.edu/opendigital/courses

1 Overview  
This is a research-oriented course designed for students who aim to develop and implement a research study in the field of open innovation. They will discuss writings relevant to the new research fields of “open and digital innovation” emerging at the interface of innovation studies, information systems, and data science. They will learn how to develop their individual research study to be published in an academic peer-reviewed journal. There are two courses offered. The course ‘Research in Open Innovation (ROI)’ I offered in Spring puts greater emphasis on foundational readings, and focuses on the firm, community, and individual. ROI Fall includes emerging research topics. Each student works on her/his own research projects. In addition, the students will observe an action-oriented research project in open innovation performed by the class (Purdue IronHacks). Empirical implementation (or piloting for new incoming students) of a research question is key in this course. The Research Center for Open Digital Innovation (RCODI) in the Discovery Park at Purdue will offer opportunities to plan and implement individual research projects, if students have not identified their own data source. Students will be required to discuss readings, plan their research project, and conduct a pilot study for their research.

2 Learning Objective  
Students should use the course to plan and implement a research project in the area of open innovation. In more detail, the objectives are as follows:

1) Gain an overview of the scientific literature on open innovation with the OIR Matrix developed for this class as basis for scientific research inquiry into open innovation

2) Develop your own theoretically and practically motivated research question in the field of open innovation and develop a theoretical model and hypotheses

3) Develop a research design for your project, identify (or plan collection of) data, and pilot your research question using small or “big data”

4) Observe an action-oriented research project on open innovation and research-design learning
3 Design of the Course

The class meets once a week.

Each week, the student is asked to read articles assigned for the class on a particular theme and use the Open Innovation Research Matrices to analyze two article, and think about that week’s “thought questions”. Each student should be prepared, for each article to know: a) practical problem addressed by the article, b) theoretical motivation for the article, c) causal model and hypotheses for the article, d) research design and findings, e) plausible alternative interpretations of the findings, f) theoretical contribution & g) connection of this article to other articles in this particular week and articles already read. In addition, each week, one or two students will be responsible for leading a discussion on two articles assigned per week. This discussion should address the topics a-g above. The discussion will take place in class. Each student has to submit her matrices for matrix deliverable one (due week 9), and matrix deliverable two (due week 16). Only one filled-in matrix for each week is required in the submitted ‘package’.

The focus of the class lies on the development of an individual research project. Each student is responsible for developing and implementing a research study, and writing up the results as an article. There are two deliverables related to that: A progress report with a proposed research and a pilot, and a final project including a piloted research. The research study will be discussed throughout the class (three times) to engage in an iterative process of developing a novel research question. There will be three presentations including a final 15 min presentation in class in an “academic conference” setting.

Further, the students will participate in action-oriented research project run by the Research Center for Open Digital Innovation (RCODI) at Discovery Park. They will participate in series of quasi-experiments as observers to deepen their understanding of experimental research settings in innovation research. Every week, the students will discuss their observations on the experiments, and summarize their research design learning. A final brief report will document these learning’s, and will develop their capabilities in action-oriented innovation research.

As a result, the class will have structured along three parts:
Part I: Presentations and discussion of theories and research based on readings
Part II: Individual project presentation
Part III: Engagement in virtual open innovation experiment: An open data contest.
4 Grading and Assessment

There are four major capabilities in focus: Scientific reading and analysis of articles with a matrix, designing and piloting an individual research project, constructive discussions, and action-oriented research and lab experiments. They will define your grade.

<table>
<thead>
<tr>
<th>1. Scientific readings and Matrix Deliverable I and II: (Comprehensiveness and comprehension)</th>
<th>20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Matrix Deliverable I (1 matrix per week)</td>
<td>10%</td>
</tr>
<tr>
<td>b. Matrix Deliverable II (1 matrix per week)</td>
<td>10%</td>
</tr>
<tr>
<td>2. Individual research project</td>
<td>50%</td>
</tr>
<tr>
<td>a. Progress report of paper (Including proposed pilot)</td>
<td>20%</td>
</tr>
<tr>
<td>b. Final paper</td>
<td>30%</td>
</tr>
<tr>
<td>3. Class participation, preparation, and final presentation</td>
<td>30%</td>
</tr>
</tbody>
</table>

5 Required Books and Readings

There is no required reading in the class. However, it requires some fundamental understanding of scientific research. Thus, for those with limited exposure to research methods and fundamentals of scientific research, I recommend that you consult a basic book on research in IS, research in social science, or economics. For example,

- [http://www.saylor.org/site/textbooks/Principles%20of%20Sociological%20Inquiry.pdf](http://www.saylor.org/site/textbooks/Principles%20of%20Sociological%20Inquiry.pdf)

In the ‘resources folder’ on blackboard you find further information about relevant readings and classes that might help you to improve your research skills.

6 Policies

6.1 Course Policy

This is a doctoral-level class, and so you are expected to create an environment that is encouraging and inspiring others to move the innovation landscape forward. The instructor’s intention is it to develop your strengths and turn you into a scholar with a deep knowledge in the field: You want to convince your others in the field about your idea and your capabilities. ‘You do not just pursue a degree when engaging in a PhD project, but you become a PhD.

Students that do not participate in the class reduce the overall value and learning experience of the class. Thus, it is expected that you participate in all classes, and that you prepare yourself for the class. All non-emergency requests to be excused from class need to be submitted before the anticipated absence. Use of cell phones and computers in class is acceptable, so long as they do not distract from the learning process. Students are expected to complete the assigned readings before the class, and submit it via blackboard.
The instructor will work as closely as possible with the students. Any questions about the course or grades will be responded to via email or the facebook site of the class (in case the class decides to use the facebook site).

6.2 Academic Dishonesty

Academic dishonesty is rare in classes like this, but it remains prohibited. Please follow the university guidelines with respect to the definition of academic dishonesty: Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

Please refer students to Purdue's student guide for academic integrity for more information: http://www.purdue.edu/odos/aboutodos/academicintegrity.php

6.3 Grief Absence Policy for Students

This class follows the University policy for Grief Absence, below:

Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for misses assignments or assessments in the event of the death of a member of the student’s family.

6.4 Violent Behavior Policy

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity.

6.5 Students with Disabilities

Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access
and participate in the programs, services, and activities at Purdue University. If you have a disability that requires special academic accommodation, please make an appointment to speak with me within the first three (3) weeks of the semester in order to discuss any adjustments. It is important that we talk about this at the beginning of the semester. It is the student's responsibility to notify the Disability Resource Center (http://www.purdue.edu/drc) of an impairment/condition that may require accommodations and/or classroom modifications.

6.6 Emergencies

If you have a personal health or other emergency, please contact me via email as soon as possible to develop a plan for successful completion of the course. Most assignments can be submitted through email, and accommodations can be made for other aspects of the class. In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

6.7 Nondiscrimination

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit www.purdue.edu/report-hate to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.
7 Schedule and Thematic Focus Areas

Below, you find the themes of each class. The readings are subject to change depending on the development of the literature and practice, as well as the individual projects and research interests of the students.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/25/16</td>
<td>No class</td>
</tr>
<tr>
<td>2</td>
<td>09/01/16</td>
<td>Introductory week (The concepts of open innovation &amp; digital innovation, and the scholarship of open innovation)</td>
</tr>
<tr>
<td>3</td>
<td>09/08/16</td>
<td>Open innovation, user innovation and open collaboration</td>
</tr>
<tr>
<td>4</td>
<td>09/15/16</td>
<td>Crowdsourcing, innovation contests and innovation economics</td>
</tr>
<tr>
<td>5</td>
<td>09/22/16</td>
<td>Excursus: Research methods: Innovation experiments</td>
</tr>
<tr>
<td>6</td>
<td>09/29/16</td>
<td>Open science, citizen science, and scientific impact</td>
</tr>
<tr>
<td>7</td>
<td>10/06/16</td>
<td>Knowledge re-use, remixing, and distributed innovation</td>
</tr>
<tr>
<td>8</td>
<td>10/13/16</td>
<td>Knowledge re-use, remixing, and distributed innovation (II)</td>
</tr>
<tr>
<td>9</td>
<td>10/20/16</td>
<td>Excursus: Crowds, human computation, and collective intelligence</td>
</tr>
<tr>
<td>10</td>
<td>10/27/16</td>
<td>Communities, social structure, and network theory</td>
</tr>
<tr>
<td>11</td>
<td>11/03/16</td>
<td>Open innovation and complexity theory</td>
</tr>
<tr>
<td>12</td>
<td>11/10/16</td>
<td>Open innovation, digital platforms, and standardization</td>
</tr>
<tr>
<td>13</td>
<td>11/17/16</td>
<td>Collaborative consumption and shared economy</td>
</tr>
<tr>
<td>14</td>
<td>11/23/16</td>
<td>Thanksgiving Vacation</td>
</tr>
<tr>
<td>15</td>
<td>12/01/16</td>
<td>Final presentations (Research Seminar at Matchbox)</td>
</tr>
<tr>
<td>16</td>
<td>12/08/16</td>
<td>No class</td>
</tr>
</tbody>
</table>

Finals: No final exams
# Timing of Research and Deliverables

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Class Preparation and Participation</th>
<th>Matrix Deliverables</th>
<th>Research (Individual and Group projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08/26/16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>09/01/16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>09/08/16</td>
<td>Presentation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>4</td>
<td>09/15/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>5</td>
<td>09/22/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>6</td>
<td>09/29/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>7</td>
<td>10/06/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>8</td>
<td>10/13/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>9</td>
<td>10/20/16</td>
<td>Preparation, Group Discussion</td>
<td>Matrix Deliverable I</td>
<td>Pitch your idea</td>
</tr>
<tr>
<td>10</td>
<td>10/27/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Project progress report due</td>
</tr>
<tr>
<td>11</td>
<td>11/03/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Present your project progress</td>
</tr>
<tr>
<td>12</td>
<td>11/10/16</td>
<td>Preparation, Group Discussion</td>
<td></td>
<td>Present your project progress</td>
</tr>
<tr>
<td>13</td>
<td>11/17/16</td>
<td>Preparation, Group Discussion, Action-oriented research report</td>
<td></td>
<td>Present your project progress</td>
</tr>
<tr>
<td>14</td>
<td>11/23/16</td>
<td>Thanksgiving Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12/01/16</td>
<td>Final presentations</td>
<td></td>
<td>Final project presentations</td>
</tr>
<tr>
<td>16</td>
<td>12/08/16</td>
<td>No class</td>
<td>Matrix Deliverable II</td>
<td>Work on your paper</td>
</tr>
<tr>
<td>16</td>
<td>12/16/16</td>
<td>Finals week</td>
<td></td>
<td>Final paper due</td>
</tr>
</tbody>
</table>
9 Topics and Readings:

9.1 Week 1 & 2: Introductory week

- “Open innovation” – Not a fad but a phenomenon? Why should we engage in research in open innovation?
- Structure of class
- What research opportunities are there for you: Presentation of data opportunities for individual research projects: Healthcare sector and virtual health communities, nanoHUB developer and user community (nanoHUB survey data), open source software communities (stackoverflow, github),
- What is the class project? Introduction into the action-oriented research/experiment in open innovation.

In this week, please get acquainted with:

Additional relevant readings and information (for interested students)

- Chesbrough H, Brunswicker S. A Fad or a Phenomenon?: The Adoption of Open Innovation Practices in Large Firms Research-Technology Management 2014;57:16-25.
- Watch the tutorials of Purdue Library http://www.lib.purdue.edu/help/tutorials on how to perform a literature search and how to use the digital library
- Ask yourself: What is an innovation? What is an open ‘system’?
- Browse the website of www.openinnovation.net, www.exnovate.org, explore the top scholars in the field and study their websites

Thought Questions:
How can we conceptualize “openness” in “open innovation”? Is open innovation a theory? How does the past literature and theories of innovation relate to the scholarship of open innovation? What is the practical relevance of the concept of open innovation? Why is the discipline of information systems of relevance for open innovation? And why?

9.2 Week 3: Open innovation, user innovation, open collaboration


Thought Questions:
What are the differences between the theory of user innovation and the notion of open innovation? What makes open collaboration systems perform? How has open source software evolved? What are interesting research question with respect to ‘governance’ of open innovation?

9.3 Week 4: Crowdsourcing, innovation contests, and innovation economics


Thought Questions:
Why do innovation contests work according to the literature on innovation economics? What factors shape the success of innovation crowdsourcing? How does the literature on
crowdsourcing relate to the theory of user innovation and collective-action innovation? What factors help us to predict the success of crowdsourcing?

### 9.4 Week 5: Excurse research methods: Innovation experiments


**Thought Questions:**

*What are the key characteristics of action-oriented research and social experiments? What are the particularities of ‘innovation experiments’? What are the pitfalls of experimental research in open innovation? What are the particularities of design science research?*

### 9.5 Week 6: Open science, citizen science, and scientific impact


**Thought Questions:**

*How is the scientific landscape changing in today’s open and digital world? What is unique about citizen science and crowd science? What new theoretical explanations do we have to develop? What is scientific impact in the digital age? What research questions are important to be addressed?*
9.6 Week 7: Knowledge re-use, remixing, and distributed innovation

Thought Questions:
What are the assumptions of the theory of cumulative innovation? When does re-combination lead to truly novel solutions? What theoretical explanations do we have for re-use leading to greater novelty?

Surprise Presentation: Industry presentation on the role of remixing (tbd)

9.7 Week 8: Knowledge re-use, remixing, and distributed innovation (II)

Thought Questions:
How can digital environments support re-mixing? What is the role of ‘mechanism’ design in this process?

Surprise Lecturer (tbd)

9.8 Week 9: Excursus: Crowdsourcing, human computation and related fields in other disciplines

Thought Questions:
What are the relationships between crowdsourcing, human computation, and genetic algorithm?
What are the challenges in developing theories of innovation (digital innovation, open innovation) using the concept of genetic algorithm?

!!! Matrix Deliverable: First 3 to 6 matrices due!!!

9.9 Week 10: Communities, social structure, and network theory


Thought Questions:
What are the basic assumptions of theories of social structure? What is the role of core and peripheral in open source, open innovation, etc.? Why is a dynamic view needed to understand the emergence of open collaboration?

!!! Progress Report is Due !!!

9.10 Week 11: Open innovation and complexity theory


Thought Questions:
What is complexity? What is a complex adaptive system (CAS)? What is complexity theory important for research on open and distributed innovation?

9.11 Week 12: Open innovation, platform theory and innovation


**Thought Questions:**
What is a platform? What theoretical lenses are used to explain platform success and sustainability? What research question help us to better understand the success of digital platforms like iOS, Apple, etc.

9.12 **Week 13: Collaborative consumption and sharing economy**

**Thought Questions:**
What is unique about the shared economy and models like uber, AirBNB? Why do we need new models for this phenomenon? What are essential questions that we should answer?

9.13 **Week 14: Thanksgiving break**

9.14 **Week 15: Final presentation (Research Symposium with Guests and Guest Speakers)**

9.15 **Week 16: No class**

!!! **Matrix Deliverable: Submit outstanding matrices: in total 6 matrices are required!**

9.16 **Finals week**

!!! **Final paper is due!!!
10 Resources
On blackboard, we have provided you with a range of resources. Some critical information is listed below:

10.1 Potential list of journals to watch (to be discussed individually)

- Research Policy
- Technovation
- Journal of Product Innovation Management
- Management of Information Systems Quarterly (MISQ)
- Information Systems Research
- Journal of Strategic Information Systems
- Management Science
- Journal of the American Society for Information Science and Technology
- Communications of the ACM
- Organization Science
- Academy of Management Journal
- Industrial and Corporate Change
- Long Range Planning
- Journal of Small Business Management
- IEEE Transactions on Engineering Management
- IEEE Internet Computing
- Social Networks
- Annual Review of Sociology
- Computers in Human Behavior
- ACM Human Computer Interactions

10.2 Class Facebook Page

https://www.facebook.com/groups/1439790606251559/