New York University – Robert F. Wagner Graduate School of Public Service  
PADM-GP-4117:  
Systems Thinking for Deep Data Literacy

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347.401.3649 [cell]

<table>
<thead>
<tr>
<th>Spring 2016 Class Schedule</th>
<th>Spring 2016 Office Hours:</th>
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<tr>
<td>Thursday Jan 28 – Thursday March 10</td>
<td>By Appointment</td>
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<tr>
<td>6:45 – 8:25 pm</td>
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<td>Room: TBA</td>
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COURSE DESCRIPTION:

Many roles in public and nonprofit organizations require staff to become sophisticated consumers, analysts and presenters of data. But before data can be used, it must first be specified and collected—and that is increasingly done via information systems. This upstream area is rife with complex problems:

- it requires non-technological staff and information system developers to communicate effectively with each other;
- data and information systems are frequently an arena of contention among different stakeholder groups including executive leadership, front-line workers and their supervisors, measurers of performance, evaluators, and funders;
- information system projects are inherently risky.

This course will provide students with a deep level of literacy about upstream data so that they can be more effective stakeholders in information systems. The course teaches a set of practical techniques for looking under the hood of an information system and interpreting its data architecture in order to assess, and potentially enhance, the system’s ability to answer analytical questions from multiple stakeholder perspectives and to be modified as needed.

Students will become familiar with:

- the nature of relational databases and Structured Query Language (SQL);
- the tiered structure of information systems and its implications for labor and financial cost;
- the importance of logical data models and their relationship with taxonomies and definitions;
- strengths and weaknesses of the competing methodologies for developing information systems; stages of and roles within information system projects; and factors that contribute to success or failure.

The course includes readings from the systems thinking traditions which are helpful for understanding the diverse ways of construing the boundaries and nature of the organizational environment; for understanding the virtues, limitations and pitfalls of common approaches to information system development; and for designing more effective, holistic and evolvable information systems.
**GRADING:**

Grading will be based on the following:

- **Four data exercise sets** (4 @ 15% = 60%)
  Three individual assignments and one small group assignment.
- **Two short writing assignments** (2 @ 20% = 40%)
  One individual assignment responding to the reading from Gareth Morgan, and one small group assignment responding to the case study narrative.
- **Optional extra credit assignment** (5%)
  To be announced.

Assignments are due on the date stated. In order to be considered timely, assignments must be turned in electronically via the NYU Classes portal (not email) prior to class, or else turned in by hand (hard copy) at the beginning of class. Any assignment that is not received by the beginning of class will be considered late and have its grade docked. Late writing assignments will be docked by a half grade immediately and by a further half-grade after each further 24 hours. *Because the answers to data exercises will be discussed in that class period and are largely objective, late data exercises will be docked to a C- and will not have any opportunity for late submission.*

**BOOK:**

Four chapters from *Images of Organization* by Gareth Morgan must be read for the assignment due in Session 4. The book is available in the Bookstore. However, students are free to read from any earlier edition; used copies may be obtained online for a much lower price.

**CALENDAR & ASSIGNMENT DUE DATES:**

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<tr>
<th>Date</th>
<th>Session/Assignment</th>
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<tr>
<td>Thursday 1/28</td>
<td><strong>Session 1: Introduction &amp; Context</strong></td>
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<td>Thursday 2/4</td>
<td><strong>Session 2: Encountering Data in the Wild</strong></td>
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<td>Assignment A (Data Exercise Set #1) Due</td>
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<td>Thursday 2/11</td>
<td><strong>Session 3: Looking Under the Hood</strong></td>
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<td>Assignment B (Data Exercise Set #2) Due</td>
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<td>Thursday 2/18</td>
<td><strong>Session 4: Some Basics of Systems Theory</strong></td>
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<td>Assignment C (Short Writing Assignment) Due</td>
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<td>Thursday 2/25</td>
<td><strong>Session 5: The Data Artifact as Model of the World</strong></td>
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<td>Assignment D (Data Exercise Set #3) Due</td>
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<td>Thursday 3/3</td>
<td><strong>Session 6: Problems of Information System Development</strong></td>
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<td>Assignment E (Data Exercise Set #4 – Group Work) Due</td>
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<td>Thursday 3/10</td>
<td><strong>Session 7: Using Systems Insights to Lay a Strong Foundation</strong></td>
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<td>Assignment F (Short Writing Assignment – Group Work) Due</td>
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SESSION DETAILS & READINGS:

SESSION 1: INTRODUCTION & CONTEXT

- Introductions
- Course goals and expectations
- Information on accessing database server
- Preparation for Assignment A
- Small group discussion of case study

Readings:
- Under the Hood [Sections TBA]
- Case Study: A New System for the Office of Child Welfare

SESSION 2: ENCOUNTERING DATA IN THE WILD

- Debriefing on Assignment A
- Visual Representation of Logical Data Models
- Preparation for Assignment B

Readings:
- Under the Hood [Sections TBA]

SESSION 3: LOOKING UNDER THE HOOD

- Debriefing on Assignment B
- Further Examination of Logical Data Models

Readings:
- Under the Hood [Sections TBA]
- M. Chisholm (2012) ‘Data Management is Based on Philosophy, Not Science’, Information Management, May 1

SESSION 4: SOME BASICS OF SYSTEMS THEORY

- Systems in General
- The Standard View of an Information System

Readings:
- Under the Hood [Sections TBA]
### SESSION 5: THE INFORMATION SYSTEM AS A MODEL OF THE WORLD

- Debriefing on Assignment D
- Distinction and Relationships Between Process and Data
- Multitier Architecture

**Readings:**
- Under the Hood [Sections TBA]
- Wikipedia: Multitier Architecture
- NPower (n.d), ‘Using flowcharts to map a service delivery process’
- [Excerpts TBA from]: M. Mattaini & C. Meyer ‘The Ecosystems Perspective: Implications for Practice’

### SESSION 6: PROBLEMS OF INFORMATION SYSTEM DEVELOPMENT

- Boehm’s Curve and the Implications of Tiered Architecture
- Thinking Different : Professional Specializations
- Waterfall vs. Agile: Methodologies in Competition
- Requirements Elicitation and the Black Box Convention

**Readings:**
- Under the Hood [Sections TBA]
- Wikipedia: Waterfall Model
- Cockburn (2008), ‘Using Both Incremental and Iterative Development’, *Crosstalk*

### SESSION 7: USING SYSTEMS INSIGHTS TO LAY A STRONG FOUNDATION

- Debriefings on Assignments E and F
- Laying a Strong Foundation for Data Infrastructure

**Readings:**
- Under the Hood [Sections TBA]