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The Research Lifecycle at UCF: A library-led institutional collaboration to develop a mental model of research support

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The Research Lifecycle at UCF:
A library-led institutional collaboration to develop a mental model of research support

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Handout to accompany the Research Lifecycle at UCF graphic
For more information visit:
http://library.ucf.edu/ScholarlyCommunication/ResearchLifecycleUCF.php

Overview of the Research Lifecycle

Researchers at the University of Central Florida have access to support for acquiring and managing grants, writing and publishing research results, and performing computational analysis of large data. However, until recently these services were not coordinated at the institutional level and there was no clearinghouse to connect researchers to available support.

In response, the UCF Libraries, with input from faculty and relevant campus units, developed a mental model of support and services of interest to university researchers.

The model, in the form of an online interactive infographic, illustrates the research lifecycle from inception to completion, identifies support services available to researchers and roles for key campus units, and is serving as a catalyst for intercampus discussion and collaboration.

The model was drafted by the Research Lifecycle Taskforce with inspiration from OpenWetWare's Research Cycle. Content is made available under a Creative Commons BY-SA.

Compared to many other research lifecycles and research data models, the Research Lifecycle at UCF is unique in that it:

- is built at the institutional level

- includes institutional research support services and places emphasis on connecting the researcher to these service points

- illustrates a typical research model in addition to a distinct suite of services for funded research

- facilitates strategic planning and campus-wide solutions to researcher needs

- promotes infrastructure building

- encourages campus partnerships

Services and Partners

Dots (or buttons) represent discrete steps in the research process. The dots signify services that support the steps and are further aligned with the four subcycles of the graphic. Colors and icons were developed to help the reader quickly identify the campus unit that offers the service. For example, blue dots also have the universal library icon and serve to indicate library-provided services.

Other campus units represented on the lifecycle include the Office of Research and Commercialization (green, dollar sign), the Faculty Center for Teaching and Learning (purple, presentation graphic), and the Institute for Simulation and Training (gold, folder graphic). The campus unit responsible for data management

services (located on the 21st Century Digital Scholarship subcycle and indicated by clouds) has not yet been determined.

On the UCF Libraries Scholarly Communication website, the dots are hyperlinked to campus units or individuals who can provide assistance with that particular step of the research cycle. Gray dots are used to indicate unsupported, or needed, services. If the dot is gray and has a library icon it is assumed that the library will eventually support that service.

Gray dots with question marks (*Collaboration Tools* and *Analysis Support*) not only are not supported, but a home unit has not been identified that would support the needed service.

Infrastructure

Finally, many lifecycle services already exist and campus units have staff in place to support them (eg, conducting writing workshops, providing citation metrics, etc). However, other services require robust infrastructure to support the provision of services (computational data and research computing services, curating and sharing research data, and hosting and preserving artifacts produced by researchers).

To signify where infrastructure is needed the design team placed colors, again associated with the campus unit that provides the service, around arrows where the related dots/services reside.

Infrastructure requirements appear in three places on the lifecycle: the gold arrow underlying the *Research Data* dot, the red arrow underlying data management services, and the blue arrow underlying library services associated with an institutional repository.

Similar to the gray buttons, gray arrows illustrate an unmet need. At present, only the gold arrow is operational and is supported by the Institute for Simulation and Training. The gray/blue arrow signifies the need for an institutional repository that would (presumably) be hosted by the library. No campus entity has yet claimed responsibility for supporting data management (the gray/red arrow), but discussions continue.

Development of the Research Lifecycle

Over the course of the academic year 2010-2011 UCF Libraries and the Office of Research and Commercialization (ORC) met to discuss research data management support. These meetings resulted in a forum that was well attended by faculty.

At the same time, the Director of Libraries appointed a taskforce to examine and make recommendations regarding the role that UCF Libraries could play in shaping the future of scholarly communication at UCF. This taskforce, led by Lee Dotson, produced a lengthy report about the state of UCF scholarly communication efforts relative to other institutions across the state and nation.

Toward the end of 2011, the taskforce presented the report to the Vice-Provost for Information Technologies and Resources. At this meeting the VP for ITR challenged the taskforce to take a broader look at existing and needed institutional services and infrastructure and create a mental model that would illustrate the flow of research throughout its lifecycle.

The taskforce reconvened and spent most of early 2011 describing steps in the research process, locating and refining a model that accommodated the lifecycle as envisioned by the committee, and identifying campus partners. Shortly after, the lifecycle was again presented to the VP for ITR who suggested that infrastructure be added to the model.

This request coincided with a reorganization of some administrative units in the Libraries and the creation of an Office of Scholarly Communication. Summer 2012 was spent meeting with representatives from campus units represented on the lifecycle: ORC, the Faculty Center for Teaching and Learning (FCTL), and the Institute for Simulation and Training (IST). The model was also presented to the Provost and sent to 34 faculty from a variety of disciplines for continued refinement and to see if the model held true for their particular types of scholarship.

Most recently, the lifecycle has been used to further discussions about research data management support at the institution. Representatives from the Libraries, IST, and Computer Services and Telecommunications have met to discuss infrastructure and services, and during one meeting a key member of the campus team was led to exclaim that after viewing the lifecycle he finally understood how his unit fit in supporting the research process.

Currently, the library is conducting a survey of faculty research data management needs and practices. Results of the survey will be used to inform decision-making about data management solution(s) for UCF researchers.

Purposes the Research Lifecycle used

Ostensibly, the Research Lifecycle was developed at the request of the VP for ITR to identify campus units that provided research services as well as to illustrate how services would flow from one unit to the next. This, in turn, would provide a framework for assigning responsibility and developing procedures at an institutional level. This goal has been realized, but additional unforeseen outcomes have resulted from this initiative.

Once library faculty began discussing research support services with relevant campus units and vetting the lifecycle with faculty; relationships were established that have led to a number of successful **collaborations**. Among these are programming for grants writers, a presentation at the University's Grants Day workshop, co-hosted seminars, and a number of librarian-led think tanks at Faculty Institutes.

Purposes the Research Lifecycle used (con't)

Librarians have also used the graphic to **advocate** for the infrastructure, staffing, publishing funds and services that further support research and scholarly publishing at the University. Within the library the lifecycle serves as a model for services provided by the Office of Scholarly Communication. Each blue button on the graphic represents a service that the library provides to campus researchers; gray buttons (services) and arrows (infrastructure) have yet to be "turned on," thus illustrating in a very compelling way the need for additional support.

Finally, librarians have used the lifecycle to **educate and facilitate** discussions about the changing scholarly communication environment, including the move to open access and sustainable publishing, and exploring new ways to create, disseminate, evaluate, and preserve research and scholarly outputs at the University. A few of the campus audiences that librarians have met with include faculty and/or graduate students from the Colleges of Medicine, Education, Health and Public Affairs, Graduate Studies, and Nursing, as well as faculty from the Center for Distributed Learning.

Interpretation of the Research Lifecycle

The purpose of an infographic is to facilitate understanding of complex and dynamic ideas or structures. As such, the goal of the Research Lifecycle was to represent components of a 21st century research lifecycle and pull together into one place campus-wide support and services available to UCF researchers.

However, with the addition of infrastructure and funded research components the graphic lost some of its explanatory power and started requiring additional interpretation. The questions most frequently asked are:

- Where do you jump in?
- Why four subcycles?
- What do the white arrows represent?
- What do the dots (or buttons) signify?
- Why are there different colors and icons?
- Why are some arrows thicker than others?

The research lifecycle design reflects the flow of how research is generally conducted, which includes iterative steps and workflows. However, we usually respond to the "Where do you jump in?" question by suggesting the *Ideas* lightbulb, which resides between *Global Scholarly Community* (dissemination of results) and the *Planning* subcycle. This acknowledges the importance of being conversant with the literature prior to being able to build upon knowledge in the field.

The four subcycles include a Planning cycle, a Project cycle, a Publication cycle and a 21st Century Digital Scholarship cycle. The subcycles reflect the flow of a typical research project, but the graphic acknowledges that some steps may not be used. An example may be a performance that does not result in publication, but instead moves directly to long term hosting and enhanced discoverability afforded by deposit in an institutional repository.

The 21st Century Digital Scholarship subcycle is an addition to the OpenWetWare model that reflects emerging areas of support needed by researchers (eg, meeting funding mandates, allowing broader access to research data and outputs, and preservation).

White arrows that lie within the Planning, Project and 21st Century Digital Scholarship subcycles indicate steps (and services available that support those steps) related to funded research. The arrows are shown as a subset of the subcycles to acknowledge that not all research is funded, however research that is funded does have additional and distinct steps, such as reporting and compliance.

Explanation of the dots, colors and icons, and arrows can be found under the *Services and Partners* and *Infrastructure* sections.