

# **KM and Organizational Learning: Where Technology and Socialization Meet**

**Irma Becerra-Fernandez, Ph.D.  
Florida International University  
College of Business Administration  
Decision Sciences and Information Systems  
Knowledge Management Lab**

# About me...



- Knight Ridder Research Professor of MIS in College of Business Administration - DSIS, Florida International University in Miami
- 2007 Kauffman Entrepreneurship Professor
- Research focus: KM, KMS, Disaster Management, Entrepreneurship
- Director and Founder (97) of FIU KM Lab  
<http://www.kmlab.fiu.edu>
- Faculty director of the Masters of Science in MIS
- Director of the MIS PhD Program
- *JMIS, Decision Sciences, CACM, IEEE TEM, ACM TOIT, EJOR, KBA, C&IE, KM Review...*
- *Knowledge Management: Challenges, Solutions, and Technologies*; Prentice Hall, 2004
- Editorial Board: *IJKL, IJLMO*

# About me...Funded Research

- Funded research (PI): \$1.8 Million. Funded by:
  - NASA Kennedy Space Center
  - NASA Goddard Space Flight Center
  - NASA Ames Research Center
  - National Science Foundation
  - Air Force Research Lab
  - Private corporations: Union Planters Bank, CTP, others
- Primarily funded by NASA to develop KMS:
  - expertise-locator systems
  - collaborative computing environments
  - Web-based advisor systems
  - Sabbatical appointment: "Develop an Integrated Strategy for KM" for the Agency. Final report Oct 30, 2005.



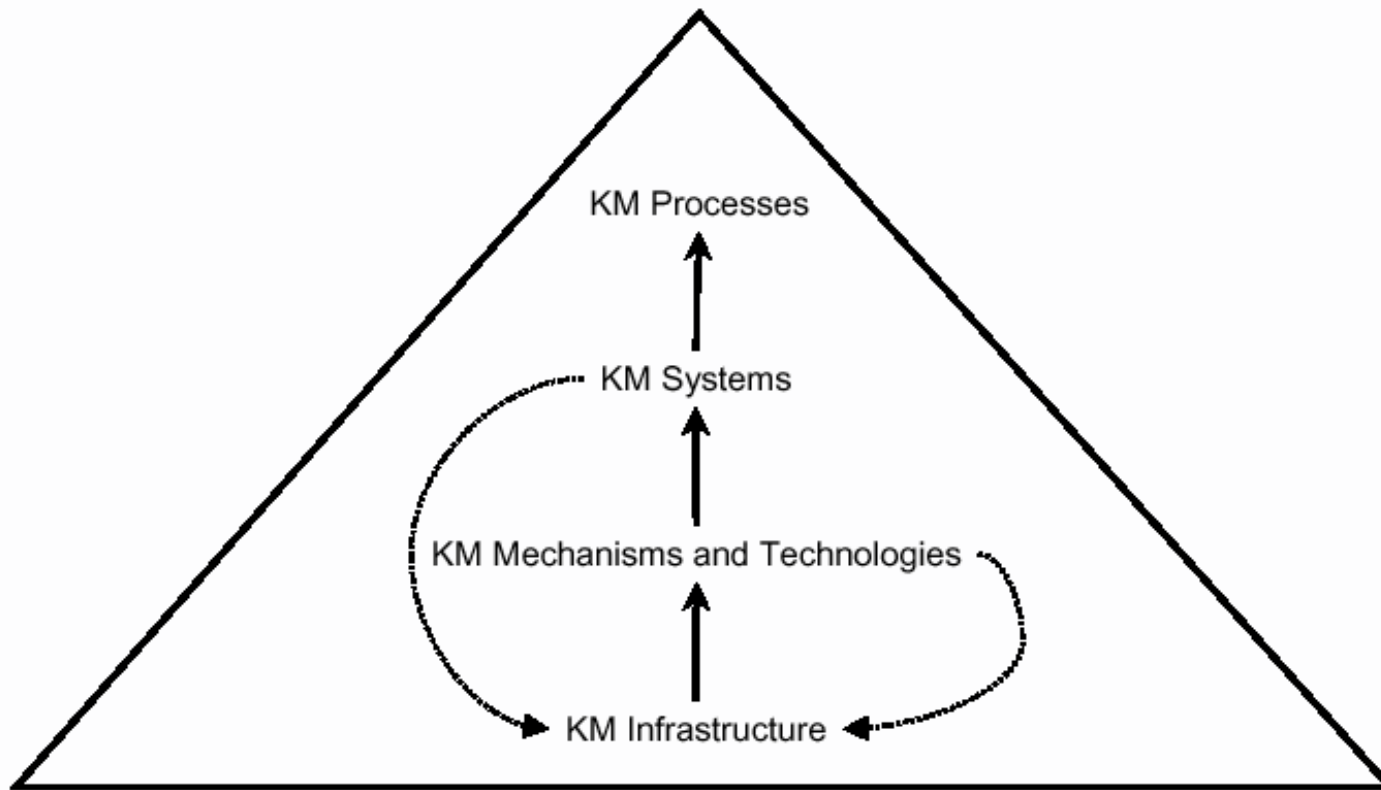
# Knowledge Management

- Support the **discovery, capture, sharing**, and **application** of organizational knowledge
- KM organizational benefits:
  - Leveraging core business competencies
  - Accelerating innovation and time to market
  - Improving cycle times and decision making
  - Strengthening organizational commitment
  - Building sustainable competitive advantage
- Expectation: KM moves from individuals to groups to the organization – ultimate beneficiary

# KM and IT

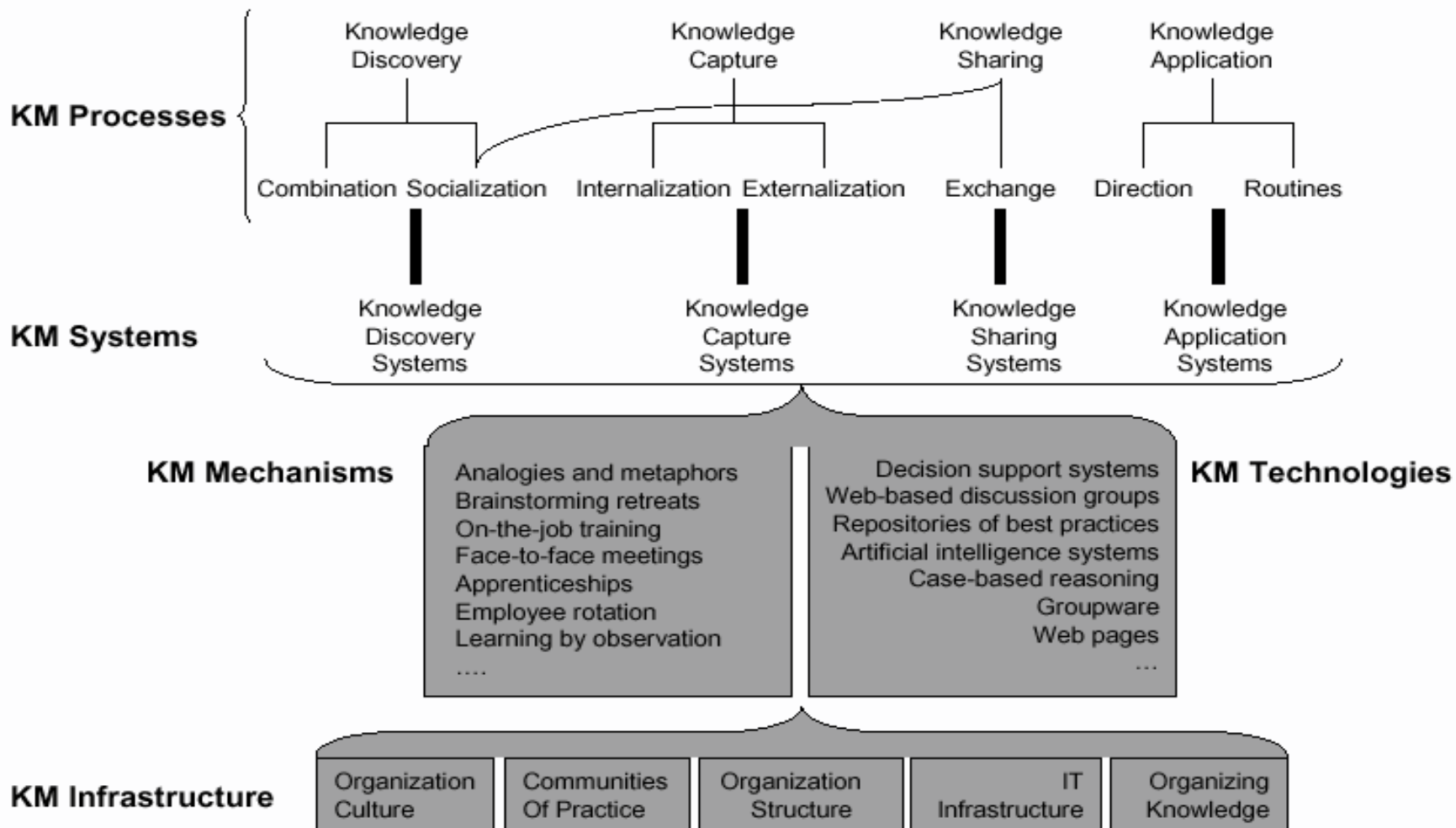
- IT facilitates sharing and accelerated growth of knowledge
- IT allows movement of information at increasing speeds and efficiencies
- IT provided major impetus enabling KM applications
- KM systems is synergy between tech and social/structural mechanisms for KM

# KM Processes





## Detailed View of Knowledge Management Solutions



# Organizational Learning

- OL + market orientation can enhance firm performance
- OL can enhance firm's innovativeness and capacity for adaptation
- OL can translate into business agility

# Organizational Learning

- “all learning takes place inside our heads; an organization learns in only two ways: (a) by the learning of its members, or (b) by ingesting new members who have knowledge the organization didn't already have”  
(Simon)
- Learning depends on what we already know.
- OL requires transmission of information from one member to another
- Learning is a very social phenomena.

# KM and OL

- Organizations are
  - knowledge-integrating institutions
  - integrating the knowledge of many different individuals and groups
  - in the process of producing goods and services

# KM and OL

- Organizational knowledge is a spiral process:
  - starts at individual level
  - expanding to group,
  - and organizational levels
- Only individuals can create knowledge
- Interactions among individuals are essential to develop organizational knowledge
- “original ideas emanate from autonomous individuals, diffuse within the team, and then become organizational ideals” (Nonaka)

# Research Questions

- How can KM systems support the goals of learning at individual, group, and organizational levels?
- How KM systems and OL tie together to provide opportunities for organization-wide socialization?

# KMS and learning at individual level

- Individuals acquire knowledge via **internalization**: observing or talking to others.
- Individuals also acquire knowledge via **externalization**: modeling their knowledge into analogies, metaphors, or problem-solving systems.
- **Direction**: also efficient to transfer instructions between individuals

# KMS and learning at individual level

- KM systems that support internalization, externalization and direction support learning at the individual level
- **Knowledge capture** and **application** processes support individual learning
- First generation KM systems
  - early AI applications 1950s: game playing & language translation.
  - 1970s expert systems: knowledge elicitation (externalization) and representation (internalization)

<b>KM Processes</b>	<b>KM Systems</b>	<b>KM Sub-Processes</b>	<b>Learning Level Impact</b>	<b>Illustrative KM Mechanisms</b>	<b>Illustrative KM Technologies</b>
<b>Knowledge Capture</b>	Knowledge Capture Systems	Externalization	Individual /Group	Models, prototypes, best practices, lessons learned	Expert systems, chat groups, best practices, and lessons learned databases.
		Internalization	Individual	Learning by doing, on-the-job training, learning by observation, and face-to-face meetings	Computer-based communication, AI-based knowledge acquisition, computer-based simulations
<b>Knowledge Application</b>	Knowledge Application Systems	Direction	Individual	Traditional hierarchical relationships in organizations, help desks, and support centers	Capture and transfer of experts' knowledge, troubleshooting systems, and case-based reasoning systems; decision support systems
		Routines	Group/ Organizational	Organizational policies, work practices, and standards	Enterprise resource planning systems, management information systems

# Knowledge Capture Systems



kmLAB

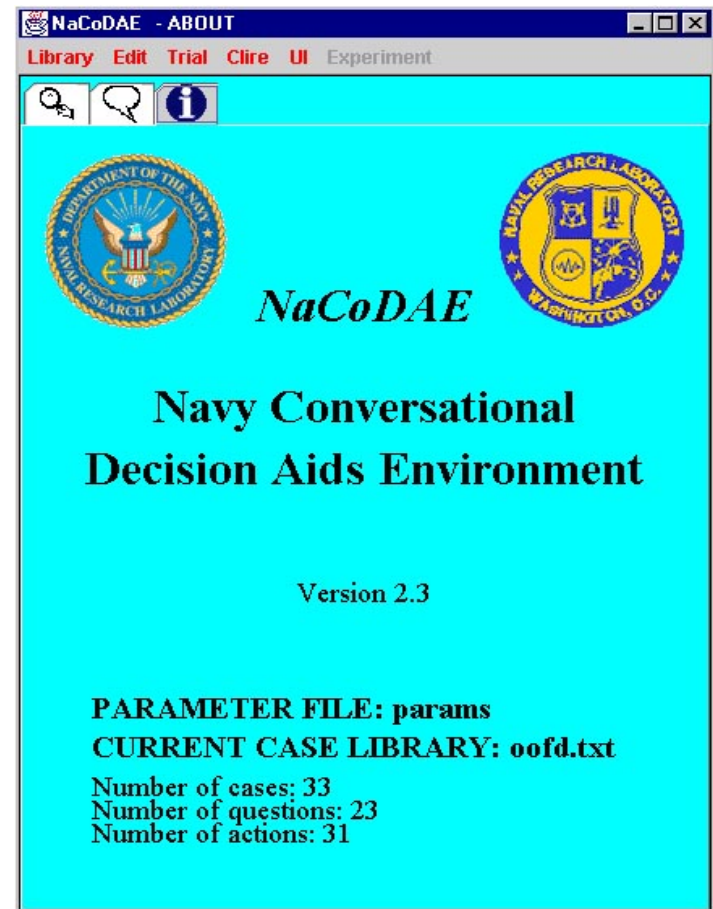
- Formalize and capture knowledge
- Example: Concept Maps Tools (UWF)

The screenshot displays the IHMC CMap Tools interface with several windows open:

- IHMC CMap Tools:** A project tree on the left showing a hierarchy of concepts under 'IHMC-UWF', including '(Root Map) RDTopLevel', 'BiasOscPowerSupply', 'Clock', 'DAIRDescription', 'Fail-SafeAmp', 'MechanicalProblem', 'MonitorAmp', 'New Problems', 'PowerProblem', 'RDDescription', 'Readiness', 'RecordAmplifier', 'RecordReproduceProblem', 'ReproduceAmp', and 'TransportsDescription'.
- RDTopLevel - EI-Tech - IHMC-UWF:** A block diagram titled 'Block diagram of the RD379A(V) - EI-Tech - IHMC-UWF' showing various components like 'TRANSPORT 2', 'CONTROL', 'REPRODUCE AMPLIFIER', and 'MONITOR AMPLIFIER'.
- Transport Wiring - EI-Tech - IHMC-UWF:** A photograph of a physical device with blue arrows pointing to components labeled 'Wiring Harness', 'SD 1', 'SD 2', 'TS 2', 'TS 3', and 'SD'.
- Components of the RD379A(V) - EI-Tech - IHMC-UWF:** A concept map showing relationships between 'RD379A(V) description' and other components. The map includes nodes for 'Wiring', 'Bias oscillator and power supply', 'Transports', 'Failsafe circuits', 'Block', 'Terminal strips', 'System wiring', 'AGC and standard record amplifiers', 'Reproduce amplifiers', 'Heads', 'Power supplies', and 'Change-over Initiation'. Relationships are labeled with terms like 'includes', 'has', 'is represented by', 'is composed of', 'produces', 'enables', 'energizes', 'have', 'require 60Hz to enable', and 'outputs direct audio to'.
- One transport - EI-Tech - IHMC-UWF:** A video player showing a man in a white uniform standing next to a rack of tape recorders.

# Knowledge Application Systems

- Problem Solving
- Example: NaCoDAE



# KMS and learning at group level

- Knowledge progresses from individual to group level
  - through synthesis of individual knowledge via social interaction
  - through use of beliefs shared to create routines
- Knowledge is produced in a group setting
  - through the sharing of common understanding
  - helps synergize the individual's knowledge
- Social processes play important role in transition of knowledge from individual to group level

# KMS and learning at group level

- KM systems that support processes of **socialization** support learning at the group level
- **Exchange**
  - the transfer of explicit knowledge between individuals in a group
  - impacts primarily the group level
- **Routines** efficient in transferring instructions at the group and organizational level.
- **Knowledge sharing** and **application** processes
  - support learning at the group level
  - 2nd generation KM systems, e.g. knowledge repositories



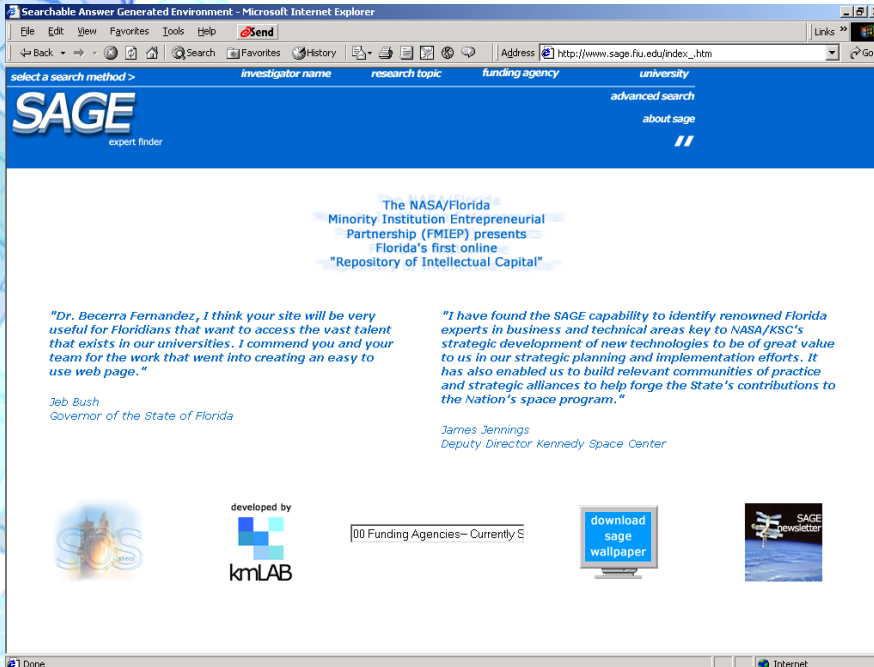
<b>KM Processes</b>	<b>KM Systems</b>	<b>KM Sub-Processes</b>	<b>Learning Level Impact</b>	<b>Illustrative KM Mechanisms</b>	<b>Illustrative KM Technologies</b>
<b>Knowledge Sharing</b>	Knowledge Sharing Systems	Socialization	Group	Employee rotation across departments, conferences, brainstorming retreats, cooperative projects Jam sessions, global brainstorming	Video-conferencing, electronic discussion groups, e-mail Jam sessions, global brainstorming
		Exchange	Group	Memos, manuals, letters, presentations	Team collaboration tools, Web-based access to data, databases, and repositories of information, best practices databases, lessons learned systems, and expertise locator systems
<b>Knowledge Application</b>	Knowledge Application Systems	Routines	Group/ Organizational	Organizational policies, work practices, and standards	Enterprise resource planning systems, management information systems



kmLAB

# Knowledge Sharing Systems

- Example Expertise Locator systems
- SAGE Search Options:
  - Investigator Name
  - Research Topic
  - University
  - Funding Agency
  - Advanced Search





# Knowledge Sharing Systems kmLAB

- Example: Expert Seeker
- ES Search Options:
  - Specialist Name
  - Expertise
  - Directorate
  - Advanced Search
  - Web Text Mining (GSFC)
  - SAGE (KSC)



# KMS and learning at the organizational level

- Organizational knowledge arises from group and individual knowledge
- **Combination**
  - helps integrate knowledge of group members
  - but new knowledge transcends knowledge of the group
- **Socialization**
  - enables synthesis of tacit knowledge across individuals and the integration of multiple streams for the creation of new knowledge
  - through joint activities rather than verbal instructions

# KMS and learning at the organizational level

- **Routines** also efficient to disseminate directions at the organizational level
- Knowledge discovery processes
  - support learning at the organizational level
  - 3rd generation KM systems, e.g. jam events, wikis.

<b>KM Processes</b>	<b>KM Systems</b>	<b>KM Sub-Processes</b>	<b>Learning Level Impact</b>	<b>Illustrative KM Mechanisms</b>	<b>Illustrative KM Technologies</b>
<b>Knowledge Discovery</b>	Knowledge Discovery Systems	Combination	Group/ Organizational	Meetings, telephone conversations, and documents, collaborative creation of documents	Databases, Web-based access to data, data mining, Web portals
		Socialization	Group/ Organizational	Employee rotation across departments, conferences, brainstorming retreats, cooperative projects Jam sessions, global brainstorming	Video-conferencing, electronic discussion groups, e-mail  Jam sessions, global brainstorming
<b>Knowledge Application</b>	Knowledge Application Systems	Routines	Group/ Organizational	Organizational policies, work practices, and standards	Enterprise resource planning systems, management information systems



kmLAB

# Knowledge Discovery Systems

- Example: Data mining and wikis



**WIKIPEDIA**  
*Die freie Enzyklopädie*

Ausgabe Frühjahr 2005



# Conclusions

- Goals of KM and OL are intertwined
- KM systems
  - provide opportunities for organization-wide socialization
  - via Web-based collaboration and global brainstorming technologies

# References



- Becerra-Fernandez, I., Sabherwal, R. Knowledge Management and Organizational Learning: where Technology and Socialization Meet. In *Knowledge Management: An Evolutionary View of the Field*, I. Becerra-Fernandez and D. Leidner [eds], M.E. Sharpe, Armonk, NY. Forthcoming.
- Becerra-Fernandez, I., Gonzalez, A., Sabherwal, R. (2004). *Knowledge Management: Challenges, Solutions, and Technologies*. Prentice Hall, Upper Saddle River, NJ.
- Becerra-Fernandez, I. (2006) Searching for Experts on the Web: A Review of Contemporary Expertise Locator Systems. *ACM Transactions on Internet Technology*. 6(4), 333-355.
- Sabherwal, R. & Becerra-Fernandez, I. (2005). Integrating Specific Knowledge: Insights from the Kennedy Space Center. *IEEE Transactions on Engineering Management*, 52(3) 301-315.
- Sabherwal, R. & Becerra-Fernandez, I. (2003). An Empirical Study of the Effect of Knowledge Management Processes at Individual, Group, and Organizational Levels. *Decision Sciences*, 34 (2) 225-261.
- Other references upon request

# Irma Becerra-Fernandez, Ph.D.

Florida International University  
College of Business Administration  
Decision Sciences and Information Systems  
University Park Campus, BA250  
Miami, FL 33199  
(305) 348-3476, fax: (305) 348-4126  
becferi@fiu.edu  
www.kmlab.fiu.edu