Building Research Administrative Efficiency and Success Using "Lean" Business Best Practices

Molly McCue  DVM, MS, PhD, DACVIM  
Associate Dean for Research, College of Veterinary Medicine

Kersten Warren  MA  
Research Advancement and Development Professional, College of Veterinary Medicine
Motivation

• Charged by the Dean to:
• “Review the current functions of the associate dean for research and the office of the associate dean of research”
• “Do the current roles and responsibilities and our policies and procedures surrounding research activities support our current research strategies?”
What is the Research Office currently doing?

Purple - already happening

Pink - changes already being made/new initiatives

Yellow - places to discuss before making changes

Green - already happening, but we need to do more
Review the current functions...

Understanding the problems
1. Gather feedback to identify problems and/or suboptimal performance and opportunities;
2. Document how the work is currently done (value stream mapping—current state);
3. Evaluate current performance and determine the significance of suboptimal performance/problems with data (performance metrics and benchmarking) and identify problems to be addressed;
4. Find the root causes of problems and suboptimal/poor performance (root cause analysis);

Designing the solutions
5. Design potential solutions (streamlining, service design/design thinking value stream mapping—future state) to address problems (fixes) and areas for improvement (improvements and innovations);
6. Prioritize implementation of proposed solutions;
7. Create a plan to implement solutions;
8. Use metrics to evaluate process improvements (performance metrics and balanced score card); and
9. Finalize new processes/procedures (documentation) or iterate over steps 4-8 until improvement targets are met.
Obtain stakeholder input

- Gather initial feedback (department chairs, staff, research committee, feedback surveys, etc.)
- Problem(s) perceived
- Document how the work is currently done & measure performance
- Problem(s) significance
- Identify the root cause of the problem(s)
- Design potential solutions and visualize the future state
- Prioritize solutions and create an implementation plan
- Create a follow-up plan
- Obtain approval(s) as needed
- Execute implementation plan
- Execute follow-up plan
- Target metrics met?
- Establish a process standard
1. Gather feedback to identify problems and/or suboptimal performance and opportunities

- Aligned research office activities with the strategic plan
- Created a research office statement of purpose and more detailed mission statement
- Feedback from individual department chairs and departmental staff
- Feedback from the research committee
  - Audit of all research committee meeting notes (2015-2018)
<table>
<thead>
<tr>
<th>Focus</th>
<th>PRE-AWARD</th>
<th>INTERNAL GRANTS</th>
<th>FINANCIAL MANAGEMENT</th>
<th>DEVELOPMENT/CAPACITY BUILDING</th>
<th>RESEARCH COMMUNICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Align and optimize pre-award procedures across the CVM</td>
<td>Streamline internal grant application process</td>
<td>Develop a fair distribution model for General Agricultural Research funds</td>
<td>Increase faculty/staff research development opportunities</td>
<td>Update and expand CVM research website content</td>
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<td>Ensure adequate staffing to address CVM pre-award needs</td>
<td>Increase efficiency of internal grant review process</td>
<td>Ensure compliance and improve reporting processes</td>
<td>Improve identification of new and novel funding types/sources</td>
<td>Streamline CVM research office communications through newsletter</td>
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<td>Create a pre-award community of practice</td>
<td>Create transparency in the review &amp; award selection processes</td>
<td>Improve NIFA capacity fund reporting compliance</td>
<td>Develop process for pre-submission peer review</td>
<td>Develop a database of one-page research summaries to share with stakeholders</td>
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<td>Enhance pre-award staff training</td>
<td>Ensure return on investment for internal grants</td>
<td>Evaluate ICR &amp; salary savings models and sharing policies</td>
<td>Increase research funding from industry and private donors</td>
<td>Help improve communication of research outcomes to public</td>
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</tbody>
</table>

## Supporting Areas
- Research Office Staffing
- Operational Efficiency
- Knowledge Management
- Data Driven Metrics
- Technology
2. Document how the work is currently done

value stream mapping

Method for analyzing the series of steps that take a product or service from its beginning through to delivery of the final product (or value)

- **Customer.** The person requesting the product or service
- **Value.** The final product or service the customer receives when the value stream is complete
- **Trigger.** The event that starts the series of steps in the value stream
- **Process blocks.** The steps used to accomplish the delivery of value
- **Lead time.** The time from the trigger to the delivery of value to the customer
- **Process time.** The actual work time (vs. waiting time between process blocks) required for each step
- **Workers.** The people who do the work
- **Systems.** The systems used by the customer and workers
200 proposals/year

1. Decision to submit proposal
   - proposals (RFPs), evaluate alignment with sponsor priorities
   - Research faculty: 16 (VPM), 12 (VCS), 14 (VBS)

2. Notify departmental pre-award staff
   - Pre-award staff: 0.8 (VPM), 0.5 (VCS), 0.5 (VBS)
   - Negligible

3. Determine requirements of sponsor
   - 1-2 hours (new sponsor, new RFP)

4. Determine scope, objectives & write science
   - Draft and revise scientific components of the proposal with co-investigators
   - Variable

5. Draft budget & justification
   - Draft and revise budget and justification in conjunction with departmental pre-award staff and/or accountant.
   - Draft and revise budget, justification and scope of work for sub-award(s)
   - 2-3 hours
   - 1 hour (non-federal)
   - 2 hours (federal)
   - Additional 2 hours per subaward
   - 8 hours CIC contract
   - Subawards significantly increase wait time
1. Fill out PRF questionnaire, submission and ICR waivers (if applicable).

2. Complete PRF form in EGMS and route electronically.

3. Assemble proposal components in Workspace, Assist, Fastlane, etc.

4. Assemble proposal components in pdf or online grants management software.

5. PI, departments chairs and associate dean(s) approve PRF.

6. Research office staff review budget, budget justification and PRF prior to signing by associate dean.

7. Re-routing RPFs due to changes or rework increases wait time.

8. Wait time associated with receipt of proposal components.

9. Multiple document versions contribute to errors, rework, increased wait time.

10. After PRF approvals, the PRF package (including all proposal documents and any sponsor provided guidance materials/documents) is submitted to SPA.

Subawards significantly increase wait time.
3. **Pre-award Performance Metrics and Benchmarking**

- **Process block 5.** Draft budget and justification
  - Estimated % complete and accurate (%C&A) when budgets are handed off from faculty to pre-award staff is <20%
  - Sub-awards significantly increase wait time

- **Process block 6.** Complete ancillary pieces
  - Drafting, editing and assembling equipment, facilities, resources, biographical sketches, animal use, letters of support, responsible conduct of research training, etc.
  - Checking documents to completeness, adherence to sponsor requirements and formatting
  - Estimated %C&A ~80%
3. Pre-award Performance Metrics and Benchmarking

• **Process block 7.** Route proposal routing form (PRF)
  • 80% C&A
  • 20% of PRFs are rerouted one or more times after approval by PI or approval by PI and secondary approvers.
  • Those 20% or RPFs are rerouted an average of 1.42 times

• **Process block 9.** Approve PRF
  • Time between PI and Research Office approval (0.4 days [standard deviation 0.6])
  • Time between PI and Chair approval (0.7 [standard deviation 1.2])
3. Pre-award **Performance Metrics and Benchmarking**

• **Process block 10.** Route to Sponsored Projects Administration (SPA)
  - 98% C&A

• Overall %C&A for pre-award process
  - \(0.20 \times 0.80 \times 0.80 \times 0.98 = 0.125\) or 12.5% C&A
Total Proposal Submissions

- **total**
- **VPM**
- **VCS**
- **VBS**

<table>
<thead>
<tr>
<th>Year</th>
<th>VPM</th>
<th>VCS</th>
<th>VBS</th>
<th>Total</th>
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<tbody>
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<td>FY15</td>
<td></td>
<td>50</td>
<td></td>
<td>195</td>
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<td>FY16</td>
<td></td>
<td>50</td>
<td></td>
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<td>FY18</td>
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<tr>
<td>FY19</td>
<td></td>
<td>50</td>
<td></td>
<td>305</td>
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FY19 (projected)
3. Pre-award Performance Metrics and Benchmarking

- Fiscal Years (FY) 15 through 18 average ~210 proposal submissions
- FY19 ~305 grant submissions
  - FY19 46% increase college-wide

<table>
<thead>
<tr>
<th>Proposal submission numbers by unit and year for comparable units across UMN</th>
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<tbody>
<tr>
<td><strong>College of Education and Human Development</strong></td>
</tr>
<tr>
<td>2014</td>
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<tr>
<td>------</td>
</tr>
<tr>
<td>208</td>
</tr>
<tr>
<td><strong>College of Biologic Sciences</strong></td>
</tr>
<tr>
<td>163</td>
</tr>
<tr>
<td><strong>College of Veterinary Medicine</strong></td>
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<tr>
<td>198</td>
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</tbody>
</table>
3. Pre-award **Performance Metrics and Benchmarking**

- Feedback
  - Late PRF approvals and SPA submissions
  - Insufficient staff time for grant volume
  - Staff need increased research office support

- Faculty feedback survey
  - Lack of expertise for some proposal types
  - Faculty want increased pre-award support
4. Find the **root causes of problems and suboptimal/poor performance**

Proposal routing timeline and metric definitions
Fishbone diagram showing the factors that sum together to result in delayed and late PRF approvals

- Faculty miss departmental deadline for budget/PRF questionnaire
- Staff managing multiple grant submissions for a single deadline
- Delayed or late PRF approval by Department chairs on timely PRFs 14.6%
- Delayed or late PRF approval by research office on timely PRFs 3.1%
- PRF re-routing after approvals due to errors 20%
- Delayed/poor responsiveness to PRF requests by Department chairs 4.2%
- Delayed/poor responsiveness to PRF requests by research office 6.3%
5. **Design potential solutions: Service design/design thinking**

Value Proposition Design

![Diagram showing Value Proposition Design with categories: Customers and Services, Gains, Jobs to be Done, Pains, Gain Creators, Products & Services, Pain Relievers, and a board with sticky notes featuring tasks and solutions.](image-url)
5. Design potential solutions: **Streamlining**

- Insufficient staff time for grant volume
  - Staff need increased research office support
  - Added 1.25 Pre-award FTE to the research office
- Now we need even more coordination!!!!!
Pre-award future state

1. Decision to submit proposal
   - Identify requests for proposals (RFPs), evaluate alignment with sponsor priorities
   - Work one-on-one with faculty to set-up individualized grant opportunity alerts in Pivot.
   - Add grant deadlines for major sponsors to CVM InfoReady grant website.
   - Research faculty FTE: 16 (VPM), 12 (VCS), 14 (VBS)

2. Notify appropriate pre-award staff
   - Pre-award staff FTE:
     - 0.5 (VPM)
     - 0.3 (VCS)
     - 0.5 (VBS)
     - 1.5 (research office)
   - Increased pre-award capacity
   - Collegiate level visibility for pre-award workload with distribution of pre-award workload between research office and departments

3. Determine requirements of sponsor
   - Initial meeting between pre-award staff and faculty
   - Standard internal deadlines
   - Standardized checklists and budget and budget justification templates for all sponsors that are routinely updated are shared with PI by pre-award staff
   - Internal deadline calculator on research office website
   - Pre-award for training grants, fellowships, faculty career awards, new sponsors, large collaborative grants in research office

4. Determine scope, objectives & write science
   - Draft and revise scientific components of the proposal with co-investigators
   - Research office coordination and support of pre-submission peer review
   - Research office support for red team review of large multidisciplinary proposals and center grants

5. Draft budget & justification
   - Draft and revise budget and justification in conjunction with departmental pre-award staff and/or accountant.
   - Draft and revise budget, justification and scope of work for sub-award(s)

Subawards significantly increase wait time
6. Complete ancillary pieces

7. Route proposal routing form (PRF)

8. Assemble proposal

9. Approve PRF

10. Route to Sponsored Projects (SPA)

Staff support for:
- Compiling letters of support and subcontract information
- "Boilerplate" language describing laboratory space, department/unit/college shared equipment and University-wide facilities/equipment/resources
- Updating biographical sketches
- Updating current and pending support

Subawards significantly increase wait time

Collaborative document sharing (Google Drive/Box) with PI and pre-award staff to limit back-and-forth ancillary documents

PRF questionnaire via Qualtrics survey

Shared Trello board shows current step in approval process

Individual email

EGMS

Grants.gov, etc.

Assemble proposal components in Workspace, Fastlane, etc.

Assemble proposal components in pdf or online grants management software

PI, departments chairs and associate dean(s) approve PRF

Research office staff review budget, budget justification and PRF prior to signing by associate dean.

0.25 FTE added to research office dedicated to proposal review.
Intent to submit form generates a new task card.
Intent to submit form answers pre-populate the card description.

Link to retrieve uploaded file(s) including the RFA/RFP.

Custom Fields capture the Departmental, Research office, SPA and Sponsor due dates for each proposal.

Comment fields allow pre-award staff to communicate about proposal and any communication to be permanently archived.

Cards can be linked to cloud storage files with final versions of submitted grant documents.
6. Prioritize implementation of proposed solutions;
7. Create a plan to implement solutions;
8. Use metrics to evaluate process improvements (performance metrics and balanced score card);
9. Finalize new processes/procedures (documentation) or iterate over steps 4-8 until improvement targets are met.
Additional Pre-award “Works In Progress”

- Developing standard templates/checklists for top 20 CVM sponsors
- Increase support for faculty
  - Biographical sketches
  - Boilerplate language facilities/equipment/other resources
  - Formatting and verification of current and pending support
  - Budgets and budget justifications
  - Letters of support
  - Launched survey for faculty input
Internal grants: Highlights
CVM Internal Grant Programs

• ~1.2 million annually given to CVM researchers through 6-8 different competitions/funding mechanisms

• Sources:
  • IDC recovery
  • USDA NIFA capacity funds
  • Internal dean’s strategic priority dollars
  • Donors

• HUGE administrative burden
  • Managing competitions
  • Managing awarded grants (currently 44 active proposals)
Internal Grants: Streamlining

- Standardize deadlines for internal grants
- Decrease administrative burden for faculty and staff
- Standardize processes and reporting
- Increase quality of feedback on internal grant submissions
- Increase transparency of funding decisions
- Improve tracking of outcomes from internal funding
Internal Grants: Streamlining

• Standardize internal grant submission deadlines

• Signature Programs every 2 years
  • Comparative Medicine
  • Population Systems
  • Emerging and Zoonotic Infectious Disease

• Capacity Grants every 2 years
  • Animal Health
  • Multistate
  • Hatch

• Signature program and capacity grants in alternating years

• Graduate student/resident funding opportunity every year
Internal Grants Streamlining

- Decrease administrative burden for faculty and staff
- Implement online grants management software (InfoReady Review)
Internal Grants: Streamlining

- Mandate peer review ✔
- Included “Letter of Intent” for internal programs ✔
## Internal Grants Improving Feedback

- **Increase quality of feedback on internal grant submissions**
- **Developed a scoring rubric to ensure equitable scoring** ✔

<table>
<thead>
<tr>
<th>Experimental Design (max 10 points)</th>
<th>&lt; 5 points</th>
<th>5 - 7 points</th>
<th>8 - 10 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Study design contains 3 or more moderate flaw(s) or a fatal flaw(s)</td>
<td>- Minor concern about adequacy of scientific approach to address hypotheses or stated need</td>
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<tr>
<td>- Other component of proposal contains fatal flaw (i.e. guideline infraction, investigator ineligible)</td>
<td>- Study design contains 1-2 moderate flaws or several minor flaws</td>
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<tr>
<td>- Justification of sample size inadequate to address hypothesis/objectives</td>
<td>- Questions regarding sample size inadequate to address hypothesis/objectives</td>
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<tr>
<td>- Scientific design adequate to address hypothesis or stated need</td>
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<tr>
<td>- Excellent, well-described study design</td>
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<tr>
<td>- Justification of sample sizes adequate</td>
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</table>

- 6 categories (hypothesis/objectives, experimental design, feasibility, impact, plan for external funding, alignment with CVM strategic initiatives)
- Initial reviews (3) and review committee input on all 6 categories
- Anonymous final scoring
Internal Grants: Reviewer Google Site

CVM Resident & Graduate Student Research Grants

This google site is designed to house all information reviewers may need for the 2019 CVM Resident & Graduate Student Research Grants competition review committee meeting. You may click the images below to find the pages of information OR use the links in the upper right corner of the web page.

Reviewer Tools

This page will provide you with all the information provided to reviewers prior to review.

- Reviewer Instructions
- Reviewer Assignments
- Scoring Rubric

Initial Rank

This page provides you with overall application rank and application rank by applicant program (graduate student or resident).
Internal Grants: Reviewer Google Site

Quad Abstracts

This page houses all Quad Abstracts for the 30 applications.

Budget & Budget Justification

This page provides you with the budget and budget justification for each application.

Live Scoring

This page will be used at the end of each grant discussion to score the applications.

NOTE: Assigned reviewers must reenter their scores in the google form during the live scoring in order to capture all in person scores. You may change your score based on discussion.
Internal Grants: Additional Comments

• Increase financial oversight on funding decisions (research committee)

• Developed graduate student/resident funding opportunity
  • 30 applications in first call for proposals (funded 11)!!!

• Feedback survey for grant submission and review process
  • >80% positive feedback
  • Faculty appreciated the more extensive reviewer comments and rubric
  • Opportunities to improve the scoring rubric and live scoring process
**Internal Grants: What’s Next?**

- Improve tracking of outcomes and impact from internal funding

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<tr>
<th>Outputs</th>
<th>Outcomes</th>
<th>Impacts</th>
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</thead>
<tbody>
<tr>
<td>• Publications</td>
<td>• Citations</td>
<td>• Changing scientific practice</td>
</tr>
<tr>
<td>• Scientific talks</td>
<td>• Improve knowledge</td>
<td>• Changing clinical practice</td>
</tr>
<tr>
<td>• Datasets</td>
<td>• Invention disclosures</td>
<td>• Changing policy</td>
</tr>
<tr>
<td>• Research tools</td>
<td>• Patent &amp; license</td>
<td>• Increased funding</td>
</tr>
<tr>
<td>(methods, software)</td>
<td>• Students trained</td>
<td>• New collaborations</td>
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<tr>
<td>• Grant submissions</td>
<td></td>
<td>• New research direction</td>
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<tr>
<td>• Clinical/diagnostic methods</td>
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<tr>
<td>• Outreach</td>
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Outputs
- Publications
- Scientific talks
- Datasets
- Research tools (methods, software)
- Grant submissions

Outcomes
- Citations
- Improve knowledge
- Patents & licenses
- Students trained

Impacts
- Changing scientific & clinical practice
- Changing policy
- Increased funding
- New collaborations
- New research direction(s)

Capture information
- Increase length of follow-up
- Minimal administrative burden to faculty

Develop metrics
- Bibliometrics (citation-based)
- Alternative metrics (social media, economic, etc.)

Scientific (funding, collaboration, directions)
- Societal (practice & policy)

Metrics can also inform CVM strengths, opportunities for strategic investment
Wrap up & Lessons Learned
Basic Lean Principles

Value - the problem you are trying to solve for the customer

Map the workflow of your division: include all actions and people involved in delivering the end product to the customer.

Customer Needs

Identify Value

Continuous Improvement

Map the Value

Create Flow

Establish Pull

Measure and discusses processes, obstacles and identify areas for improvements

A pull system optimizes resources so service/products delivered as need arises

https://kanbanize.com/lean-management/what-is-lean-management/
Visualize and Automate Your Workflow

• Keep your teams in the loop and see who is working on what anytime
• Visualize the assignments of each team and how they are progressing
• Automate routine activities and allow people to focus on tasks that actually require their attention and talents
Lessons Learned During Process

• Be prepared for resistance to change from the team
• Seek continuous input and feedback from the team during the process to create buy-in and ownership
• Integrate changes at a reasonable pace
• Creative ways to learn about these processes (book club and discussions, SCRUM training, Lynda videos)
• Emphasize value of skills acquired by research administrators when using business processes (Agile, process mapping, value proposition design)
• Improved efficiency for daily processes creates time to do more of what you want to be doing (communications, research development)
QUESTIONS??
Value Proposition Design Exercise