Improving Office Efficiency Using Banner Workflow

Presented by
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• Jennifer McMillan
• Ken Foshee

February 16, 2014
Session S1.1
Session Rules of Etiquette

• Please turn off your cell phone

• If you must leave the session early, please do so as discreetly as possible

• Please avoid side conversation during the session

Thank you for your cooperation!
Introduction

• This session will explore how the Office of the University Registrar at The University of Alabama has made effective use of the Banner Workflow product. This will include:
  – Why use workflow
  – Review of decision making process
  – Technical issues
  – Reporting
Why Use Banner Workflow

... or any workflow
Why Use a Workflow

• Replace paperwork – replace sheet of paper easily lost/misplaced
• Convenient means to initiate a request – user can submit request electronically at their convenience
• Perform repetitive tasks – update records via pl/sql
• Reports – track number of requests, status, hold-ups, etc.
• Notifications (change of address, etc)
Workflows at UA

- Grade Change
- Admitted to Candidacy
- Graduation Application
- Transfer Articulation
- University Withdrawal
Functional Decision Process

Review of Existing Workflow
Planning

• Get support

• Know your own process
  – Make no assumptions
  – What other offices does this process impact?

• Meet with all relevant players
  – Make the conversation safe
  – Come prepared with a list of questions
    • Walk me through each step and define all approvals needed
    • Where else are you logging information (spreadsheets, etc.)?
    • Where are the bottlenecks?
    • What reporting capabilities are needed?
  – Take detailed notes
  – Don’t be afraid to ask why
Design

• Lay out everything you have discovered
  – Follow up with players when clarification is needed
• Identify similarities/differences in process
• Categorize steps
  – Automated tasks
  – Manual tasks
  – Notifications
  – Decision points
• Keep reporting considerations in mind
  – Success metrics?
• Do not insert unnecessary steps
  – What is this adding to the process?
Design

• Make things easy on you too!
  – Don’t try to automate or display something just because it’s possible…some things are just easier to handle manually
  – Give your users as much power as you’re comfortable giving them
    • Managing security
    • Workflow modeling in Test environment

• Incorporate trusted users in the design process
  – Don’t wait until you have a “finished” product
  – Don’t assume they will like your “better” way to handle something
Testing

- Testing, testing & more testing
Implementation

• Determine your timeline
  – Adjust when necessary
  – Don’t’ compromise your product to hit an arbitrary deadline

• What training tools are necessary?
  – FAQs, Handouts, Video Tutorials?

• Make all users aware of the change – no surprises!

• How fast to kill your old process?

• Be prepared to make changes after go-live

• Know who to contact if problems arise
A Walk Down Memory Lane

• 2011: 7,513 paper applications
• Undergraduate vs. Graduate vs. Law
• Communication with students
• Manual data entry
• Final sign-off
Kickoff of Initial Workflow

• Upon insert of SHRDGMR (SHADEGR) record from SSB application, a database trigger will start the initial workflow

• Name each workflow to facilitate sort, locate, report:
  – Term
  – Graduation_Initial (or Graduation_Final)
  – Program
  – Student Name
  – Banner ID
Obtain Student Information

- Obtain student data
  - Banner ID & name
  - Text SPACMNT
  - Email
  - Send confirmation
  - Curriculum
  - Pending honors
  - Campus
Departmental Approval – Graduate Students

• If Graduate Student, set Departmental Approver
  – Dynamic task assignment
  – External table with email/third party ID/department code

• Email departmental approval

• Assign task to approver

• Deny or approve
  – Email student
  – Set Degree Status (PN/DN)
  – Set Graduation Status (DI/ND)
  – Update Comments
College Approval

• Set College Approver
  – Dynamic task assignment
  – Graduate vs. Undergraduate vs. A&S
• No email notification due to volume
• Deny or approve
  – Email student
  – Set Degree Status (PN/DN)
  – Set Graduation Status (CI/NC)
  – Update Comments
Registrar’s Office Review

- University requirements
- Set Graduation Status (RI/RF)
- RF – no additional review needed prior to awarding
- Update Comments
- OUR will deny at request of college
### Coding Structure

#### Graduation Status Validation (STVGRST)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>Web Application</td>
<td>Initial Value</td>
</tr>
<tr>
<td>DI</td>
<td>Initial Approval by Department</td>
<td>Departmental Decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Graduate Students)</td>
</tr>
<tr>
<td>ND</td>
<td>Denied by Department</td>
<td></td>
</tr>
<tr>
<td>CI</td>
<td>Initial Approval by College</td>
<td>College/Dean's Office Decisions</td>
</tr>
<tr>
<td>NC</td>
<td>Denied by College</td>
<td></td>
</tr>
<tr>
<td>RF</td>
<td>Expected to Complete Degree</td>
<td>Office of the University Registrar Decision</td>
</tr>
<tr>
<td>RI</td>
<td>Initial Approval by Univ Reg</td>
<td></td>
</tr>
<tr>
<td>BA</td>
<td>Batch Awarded</td>
<td>Award by Batch</td>
</tr>
<tr>
<td>CF</td>
<td>Final Approval by College</td>
<td>Award by College</td>
</tr>
<tr>
<td>NR</td>
<td>Denied by Registrar</td>
<td>Final Workflow</td>
</tr>
</tbody>
</table>
## Workflow Status Search Results

<table>
<thead>
<tr>
<th>Organization</th>
<th>Workflow Specifics Name</th>
<th>Business Process Name</th>
<th>Status</th>
<th>Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>201230 Graduation_Award (LW-LW-D) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Award</td>
<td>Completed</td>
<td>04-Jun-2012 10:50:35 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201230 Graduation_Award (LW-LW-LLM) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Award</td>
<td>Completed</td>
<td>04-Jun-2012 10:10:19 AM</td>
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<tr>
<td>Root</td>
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<td>OUR Graduation Award</td>
<td>Completed</td>
<td>04-Jun-2012 09:53:07 AM</td>
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<tr>
<td>Root</td>
<td>Law Test 11277700</td>
<td>OUR Graduation Award</td>
<td>Completed</td>
<td>01-Jun-2012 02:23:47 PM</td>
</tr>
<tr>
<td>Root</td>
<td>201210 Graduation_Initial (UC-HS-BHS) 11277700</td>
<td>OUR Graduation Application</td>
<td>Completed</td>
<td>18-Oct-2011 06:18:35 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201240 Graduation_Initial (LW-LW-LLM) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Application</td>
<td>Ready</td>
<td>04-Jun-2012 10:51:34 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201230 Graduation_Initial (LW-LW-JD) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Application</td>
<td>Completed</td>
<td>04-Jun-2012 10:40:21 AM</td>
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<tr>
<td>Root</td>
<td>201240 Graduation_Initial (LW-LW-LLM) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Application</td>
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<td>04-Jun-2012 10:06:43 AM</td>
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<td>Root</td>
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<td>OUR Graduation Application</td>
<td>Completed</td>
<td>04-Jun-2012 08:53:49 AM</td>
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<tr>
<td>Root</td>
<td>201240 Graduation_Initial (UC-AS-BS) DegreeWorks, Transfer 11277700</td>
<td>OUR Graduation Application</td>
<td>Completed</td>
<td>16-May-2012 03:56:53 PM</td>
</tr>
</tbody>
</table>
## Approver Task View

### Student Information Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Transfer DegreeWorks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWSID</td>
<td>11277700</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:jennifer.mcmillan@ua.edu">jennifer.mcmillan@ua.edu</a></td>
</tr>
<tr>
<td>Graduation Term</td>
<td>2012-04D</td>
</tr>
<tr>
<td>Application Data</td>
<td>19-Jan-2012 11:50:48 AM</td>
</tr>
</tbody>
</table>

### Program of Study

<table>
<thead>
<tr>
<th>Catalog Year</th>
<th>2010-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree</td>
<td>AB</td>
</tr>
<tr>
<td>Major(s)</td>
<td>C3</td>
</tr>
<tr>
<td>Concentrations:</td>
<td></td>
</tr>
<tr>
<td>Minors:</td>
<td></td>
</tr>
</tbody>
</table>

If the student's curriculum information above appears to be incorrect, please contact the Office of the University Registrar. Once the information has been corrected by the University Registrar, you will need to select the 'Reload' option and click 'Complete' to update any changes.

The Latin honors designation below is calculated based on the student's earned hours and institutional GPA as of the end of the last semester completed by the student. Final honors will not be calculated until the student has completed all coursework in the semester prior to graduation. Graduate students are not eligible for Latin honors.

Honors (Potential): 
- SP summa cum laude (pending)

Comments typed in the field below will be entered into SPACMNT in Banner and forwarded to the Office of the University Registrar.

**Comments for SPACMNT:**

---

Comments typed in the field below will be included in the approval or denial email generated upon your completion of this form. (Not Required)

**Comments for Student Email:**

---

If the student's major/minor/degree information appears to be incorrect, please contact the Registrar's Office at 205-348-2020. Once the information has been corrected, you will need to select Reload and click 'Complete' to update any changes.

**Decision (Outcome Status):**
- **Approve**: Student is expected to complete all requirements (DR)
- **Denied**: Student cannot complete all graduation requirements (DN)
- **Referred**: Update Curriculum Data to reflect any changes

By selecting the 'Approve' option and clicking 'Complete', you are approving of this student's status as a degree candidate and forwarding this application to the Office of the University Registrar. By selecting the 'Denied' and clicking 'Complete', you are denying this student's degree application and generating a denial email to the student.
<table>
<thead>
<tr>
<th>CRN</th>
<th>Subj</th>
<th>Number</th>
<th>Hrs</th>
<th>Grade</th>
<th>Type</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>17347</td>
<td>NEW</td>
<td>400</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>105hrs in 6hrs/8hrs short.</td>
<td>4/25/12</td>
</tr>
<tr>
<td>17457</td>
<td>NEW</td>
<td>460</td>
<td>4</td>
<td>S</td>
<td>Text</td>
<td>3-M, no course found.</td>
<td></td>
</tr>
<tr>
<td>16455</td>
<td>NEW</td>
<td>405</td>
<td>2</td>
<td>S</td>
<td>Text</td>
<td>6-W in NEW200 &amp; NEW400.</td>
<td></td>
</tr>
<tr>
<td>10504</td>
<td>BSC</td>
<td>497</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>115hrs in 12hrs.</td>
<td>2/10/12</td>
</tr>
<tr>
<td>15119</td>
<td>KN</td>
<td>301</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>A+</td>
<td></td>
</tr>
<tr>
<td>11719</td>
<td>PY</td>
<td>377</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B</td>
<td></td>
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<td>18751</td>
<td>PY</td>
<td>413</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B+</td>
<td></td>
</tr>
<tr>
<td>18400</td>
<td>ART</td>
<td>578</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>104hrs in 6hrs.</td>
<td>3/2/12</td>
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<td>18587</td>
<td>ART</td>
<td>362</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>10419</td>
<td>HHE</td>
<td>440</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>6-W in ART268 &amp; TCF440.</td>
<td></td>
</tr>
<tr>
<td>10277</td>
<td>KN</td>
<td>155</td>
<td>1</td>
<td>S</td>
<td>Text</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>10025</td>
<td>TCF</td>
<td>261</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>10282</td>
<td>TCF</td>
<td>440</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B+</td>
<td></td>
</tr>
<tr>
<td>18603</td>
<td>ANT</td>
<td>468</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>125hrs in UH 300.</td>
<td>3/19/12</td>
</tr>
<tr>
<td>18787</td>
<td>ANT</td>
<td>440</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>18322</td>
<td>PR</td>
<td>480</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>18670</td>
<td>UH</td>
<td>300</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>18486</td>
<td>FSG</td>
<td>422</td>
<td>3</td>
<td>S</td>
<td>Text</td>
<td>124hrs in 6hrs.</td>
<td>3/5/12</td>
</tr>
</tbody>
</table>
Award Workflow – Approval Timing

1. GetPIDandName
2. GetMajorInfo
3. GetFinalHonors
4. GetComments
5. GetTermText
6. GetStudentEmail
7. GetCollegeApprover
8. CheckOURApproval
9. Approved by College
   - UpdateGradStatusToCF
   - OUR_Review
     - UpdateRegistrarComments
     - Approved by OUR
       - ApprovedNotification
     - Denied by OUR
       - DeniedNotification
   - Reload Curriculum
   - Denied by College
   - CollegeApproval
   - UpdateCollegeComments
Award Workflow – Honors Timing

1. Set $\text{DEGS}_{\text{CODE}}$ to "AY" and $\text{SHRDGRM}_{\text{GRST}_{\text{CODE}}}$ to 1.
2. Decision is "1—a"
   - Approved by OUR
     - ApprovedNotification
     - UpdateDegreeStatusAY
     - UpdateGradStatusAY
   - Denied by OUR
     - DeniedNotification
     - UpdateDegreeStatusON
     - UpdateGradStatusON
   - Denied by College
   - No Honors
     - UpdateHonors

3. Decision is "0"
   - Terminates the workflow.
Results

- Planning through Implementation: ~ 10 months
- Go live: 10/15/11 for Spring 2012 Graduation
- No more lost applications
- 24/7 process monitoring

<table>
<thead>
<tr>
<th></th>
<th>Fall 2011</th>
<th>% of Total</th>
<th>Fall 2013</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Days</td>
<td>238</td>
<td>14.3%</td>
<td>1448</td>
<td>73.6%</td>
</tr>
<tr>
<td>12 Days</td>
<td>1257</td>
<td>75.6%</td>
<td>514</td>
<td>26.2%</td>
</tr>
<tr>
<td>16 Days</td>
<td>60</td>
<td>3.6%</td>
<td>3</td>
<td>.1%</td>
</tr>
<tr>
<td>&gt; 16 Days</td>
<td>107</td>
<td>6.4%</td>
<td>3</td>
<td>.1%</td>
</tr>
<tr>
<td>Total</td>
<td>1662</td>
<td></td>
<td>1968</td>
<td></td>
</tr>
</tbody>
</table>
Technical Considerations
Workflow Initiation
Workflow Initiation

• Workflows are initiated by a business event, some action that occurs.
  – Event can be initiated manually
  – Event can be initiated from an external application
  – Event can be initiated via a web service call
    (have not implemented this at UA, but other schools have posted their examples on the Commons)
Manual Workflow Initiation

My Processes

Organization: Root
Workflow Name: OUR Graduation Pending: 3
Workflow Specifics Name: 201410_Graduation_Initial_JMcMillan
Priority: Normal
Workflow Note:

Required Parameters

* ApplicationDate: 16-Feb-2014 02:00:00 PM
* CWID: UA1234567
* Level: GR
* Shrdgmr_Seq_No: 1
* Term: 201410

Start Workflow  Reset  Cancel
Manual Workflow Initiation

A workflow is started and ready to be processed.

Best practice: Pass in SPRIDEN_ID as an event parameter, and use an automated activity to find the PIDM. That way, if the workflow needs to be submitted manually, the user can find the SPRIDEN_ID (on SPAIDEN), but usually they do not have the PIDM.
External Workflow Initiation

• An event can also be initiated from an application external to Workflow.

• Examples:
  – From a SSB page
  – From a database trigger
  – From a batch job
  – From another workflow
Choose Term of Withdrawal

A student may withdraw from the University prior to the last day of classes (excluding final exam periods) in the fall, spring, or summer terms following clearance by the Office of the University Registrar. No notation of courses attempted is made on the permanent record of a student who withdraws from the University during the change of schedule period (when a course can still be added). After the change of schedule period, a grade of "W" ("Withdrawn") is assigned for all courses in which the student was enrolled. A student may not use this policy for courses in which penalty grades were assigned as a result of academic misconduct. For the complete withdrawal policy, please refer to the University catalog. For information regarding the financial implications of a withdrawal, please click here.

Please select the term for which you wish to withdraw from all classes at the University. A withdrawal reason must also be specified.

Choose a term from the following list:  
Spring 2014 ▼

Indicate reason for withdrawal from term:  
Personal Reasons ▼

Submit for processing

RELEASE: UA 1.0
Workflow triggered from database

‘SO’ught degree record saved on SHADEGR ...

With a WA status ...

Call package to post workflow event
Batch Workflow Initiation

UC4 job accepts popsel parameters and runs process to create multiple workflows.
Batch Workflow Initiation

PROCEDURE p_initiateGraduationAwardWF
(p_use_popsel     IN VARCHAR2 DEFAULT NULL,
p_popsel_application IN VARCHAR2 DEFAULT NULL,
p_popsel_selection  IN VARCHAR2 DEFAULT NULL,
p_term            IN VARCHAR2,
p_level           IN VARCHAR2 DEFAULT NULL,
p_college         IN VARCHAR2 DEFAULT NULL,
p_degree          IN VARCHAR2 DEFAULT NULL) IS

CURSOR get_pidms_from_popsel IS
    select shrdgmr_pidm pidm, shrdgmr_seq_no seqno, shrdgmr_term_code_grad term
    from saturn.shrdgmr
    where shrdgmr_term_code_grad = p_term
    and shrdgmr_degs_code = 'PN'
    and shrdgmr_pidm in (select trim(glbextr_key) from general.glbextr
                          where glbextr_application = 'STUDENT'
                          and glbextr_selection = 'GRADUATION AWARD WF');

BEGIN
IF ((substr(nvl(p_use_popsel,'N'),1,1) = 'Y')
    and (p_popsel_application is not null) and
    (p_popsel_selection is not null)) THEN

    for pidm_rec in get_pidms_from_popsel loop
    exit when get_pidms_from_popsel NOTFOUND;

    p_TriggerGraduationAwardWF(pidm_rec.pidm, pidm_rec.seqno, pidm_rec.term);
    end loop;
END IF;

EXCEPTION
    WHEN NO_DATA_FOUND THEN NULL;
    WHEN OTHERS THEN RAISE;
END p_initiateGraduationAwardWF;
Batch Workflow Initiation

Multiple workflows are created.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Workflow Specifics Name</th>
<th>Business Process Name</th>
<th>Status</th>
<th>Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Jones, Loretta 11273462</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Crenshaw, David 11214982</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Boswell, Kyle 11172995</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Fuller, Katelyn 11258143</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) McMillian, Bradley 10191993</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Anderson, Scott 11201253</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Joshi, Maulik 11281540</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Hicks, Sarah 11259206</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Cooley, Tina 11399795</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
<tr>
<td>Root</td>
<td>201410 Graduation_Award (UG-CB-BCB) Grant, Andrew 11264860</td>
<td>OUR Graduation Award</td>
<td>Ready</td>
<td>14-Feb-2014 11:48:12 AM</td>
</tr>
</tbody>
</table>
Trigger workflow from a workflow
Workflow Event Post

In all of these examples, the workflow is initiated through the Banner Event Queue.

A call is made as shown below to pass the event and its associated parameters to event queue.

An event may also be posted to Workflow via a web service call. We have yet not implemented that setup at UA. However, other schools have done this and have posted information on the Commons.
Post to Event Queue

IF goksyst.f_issystemlinkenabled ('WORKFLOW') -- Make sure WORKFLOW is enabled --
THEN -- Set event code to event name with Target System Code of WORKFLOW --
    event_code := SUBSTR (gokevnt.f_checkevent ('WORKFLOW', 'OUR_GRADAPP_PN'), 1, 20);

    /* Parameters are defined on Banner Form GOREQPG for Group Code
       GOREQPG_SEQNO MUST match the number in the index for v_params */
    v_params (1).param_value := 'OUR_GRADAPP_PN';  -- EVENTNAME --
    v_params (2).param_value := '';  -- PRODUCTTYPE --
    v_params (3).param_value := v_app_term|| ' Graduation Initial (' ||v_levl_code||'-'||v_coll_code_1||'-'||v_degc_code ||') ' ||nvl(UA_REGISTRAR.f_getstufullname(v_stu_pidm),'-')||'
        v_params (4).param_value := to_char(v_app_date,'DD-MON-YYYY HH:MI:SS AM');
    v_params (5).param_value := v_levl_code;
    v_params (6).param_value := v_stu_cwid;
    v_params (7).param_value := v_app_seqno;
    v_params (8).param_value := v_app_term;

    -- Call package to initiate the event --
    baninst1.gokparm.send_param_list (event_code, v_params, v_error_ind);
Workflow Event Setup

• Before Workflow can recognize an event, the event must be defined in Workflow.

• Create a business event which identifies the parameters that will be passed to the workflow(s) and which workflow(s) are valid for that event.

• Create a companion business process to define which workflows will be started as a result of the event, and which users (roles) are initiators (have access to start the workflow manually).
# Business Event Setup

**Business Events > Business Event Definitions**

## Business Event

**Name:** OUR_GRADAPP_PN

### Parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Guaranteed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ApplicationDate</td>
<td>Grad Application Date</td>
<td>Date</td>
<td>Yes</td>
</tr>
<tr>
<td>CWID</td>
<td>Student Campus-Wide ID</td>
<td>Text</td>
<td>Yes</td>
</tr>
<tr>
<td>Level</td>
<td>Level Code</td>
<td>Text</td>
<td>Yes</td>
</tr>
<tr>
<td>SeqNo</td>
<td>Degree Sequence Number</td>
<td>Numeric</td>
<td>Yes</td>
</tr>
<tr>
<td>TERM</td>
<td>Term Code</td>
<td>Text</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Associated Workflows

- Root - OUR Graduation Pending - 2
- Root - OUR Graduation Pending - 3

[Add Workflow Association] [Delete Selected Workflows]
## Business Process Setup

### Associated Workflows

<table>
<thead>
<tr>
<th>Organization</th>
<th>Workflow Definition</th>
<th>Effective From</th>
<th>Effective To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>Root - DUR Graduation Pending 0</td>
<td>25-Aug-2011 03:35:01 PM</td>
<td>18-Nov-2011 01:49:29 PM</td>
</tr>
<tr>
<td>Root</td>
<td>Root - DUR Graduation Pending 1</td>
<td>18-Nov-2011 01:49:48 PM</td>
<td>27-Feb-2012 01:27:14 PM</td>
</tr>
<tr>
<td>Root</td>
<td>Root - DUR Graduation Pending 2</td>
<td>12-Apr-2012 04:40:53 PM</td>
<td>03-May-2013 09:24:33 AM</td>
</tr>
<tr>
<td>Root</td>
<td>Root - DUR Graduation Pending 3</td>
<td>03-May-2013 09:24:43 AM</td>
<td></td>
</tr>
</tbody>
</table>

### Associated Events

<table>
<thead>
<tr>
<th>Organization</th>
<th>Event Name</th>
<th>Guard Condition Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>OURGRADAPP_PN</td>
<td></td>
</tr>
</tbody>
</table>

### Authorized Initiators

<table>
<thead>
<tr>
<th>Organization</th>
<th>Role Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>DUR Graduation Admin</td>
</tr>
</tbody>
</table>

[Add Authorized Initiator, Delete Selected Authorized Initiators]
INB - Event Setup

• If the workflow is to be initiated through Banner Events Processing, the event must also be defined in Banner.
• Events and event parameters are defined in INB-Banner on the
• Event Queue Maintenance forms

Banner
General [*GENERAL]
System Functions/Administration [*GENSYS]
Event Queue Maintenance [*GENEQS]
  Target System Code Validation [GTVEQTS]
  Parameter Code Validation [GTVEQPM]
  Parameter Group Code Validation [GTVEQPG]
  Event Queue Code Validation [GTVEQNM]
  Parameter Group Definitions [GOREQPG]
  Event Queue Name Definitions [GOREQNM]
  Event Queue Record Maintenance [GOAEQRM]
Parameter Validation

Any new parameters need to be defined on the validation form GTVEQPM. Parameters can be used for multiple workflows.
Event Code Validation

Your event must be defined on the event code validation form.

<table>
<thead>
<tr>
<th>Event Code</th>
<th>Description</th>
<th>User ID</th>
<th>Activity Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDTERM</td>
<td>LDI Term Event</td>
<td>BASELINE</td>
<td>02-NOV-2004</td>
</tr>
<tr>
<td>LDGROUP</td>
<td>LDI Cross Listed Group Event</td>
<td>BASELINE</td>
<td>02-NOV-2004</td>
</tr>
<tr>
<td>LDUMEM</td>
<td>LDI Cross Listed Member Event</td>
<td>BASELINE</td>
<td>02-NOV-2004</td>
</tr>
<tr>
<td>NEWGIFT</td>
<td>A new Gift from a donor</td>
<td>BASELINE</td>
<td>29-NOV-1999</td>
</tr>
<tr>
<td>NSFNOTIFY</td>
<td>NSF Notification for PEs</td>
<td>LOCAL</td>
<td>30-JUN-2009</td>
</tr>
<tr>
<td>OUR_GRADAPP_wf</td>
<td>OUR Graduation Award WF</td>
<td>LOCAL</td>
<td>14-NOV-2011</td>
</tr>
<tr>
<td>OUR_GRADAPP_Pn</td>
<td>Pending Graduation App WF</td>
<td>LOCAL</td>
<td>26-JUL-2013</td>
</tr>
<tr>
<td>OUR_SECTIONCANCEL</td>
<td>OUR Section Cancellation WF</td>
<td>LOCAL</td>
<td>12-DEC-2010</td>
</tr>
<tr>
<td>OUR_TRANSFER_EVAL</td>
<td>Transfer Course Evaluation</td>
<td>LOCAL</td>
<td>02-SEP-2011</td>
</tr>
<tr>
<td>OUR_WITHDRAWAL</td>
<td>UA Student Withdrawal WF</td>
<td>LOCAL</td>
<td>15-SEP-2010</td>
</tr>
<tr>
<td>PAFCHANGE</td>
<td>Changes to the PAF on NOAEPAF</td>
<td>BASELINE</td>
<td>29-NOV-1999</td>
</tr>
<tr>
<td>PWDCCHANGE</td>
<td>Password Change</td>
<td>BASELINE</td>
<td>30-NOV-1990</td>
</tr>
<tr>
<td>PYRL_PAF_WORKFLOW</td>
<td>EAPF Workflow</td>
<td>LOCAL</td>
<td>16-SEP-2011</td>
</tr>
<tr>
<td>RECNOTIFY</td>
<td>Receiving Notification</td>
<td>LOCAL</td>
<td>24-AUG-2007</td>
</tr>
<tr>
<td>SECTION_CANCELLED</td>
<td>Cancelled Section Broadcast</td>
<td>BASELINE</td>
<td>31-DEC-1990</td>
</tr>
<tr>
<td>TEM_ADHOC_APPROVAL</td>
<td>TE Approval Event</td>
<td>LOCAL</td>
<td>29-NOV-2012</td>
</tr>
<tr>
<td>TEM_APPR_OVREDE</td>
<td>TEM Overdue Notice</td>
<td>LOCAL</td>
<td>27-JUN-2013</td>
</tr>
<tr>
<td>TE_ADHOC_APPROVAL</td>
<td>TE Approval Event</td>
<td>BASELINE</td>
<td>29-NOV-2012</td>
</tr>
<tr>
<td>UA_ADHOC_MAJOR_CHG</td>
<td>Admissions Major Change WF</td>
<td>LOCAL</td>
<td>15-MAY-2009</td>
</tr>
<tr>
<td>UA_GRADAPP_Pn</td>
<td>Pending Grad. application WF</td>
<td>LOCAL</td>
<td>07-AUG-2011</td>
</tr>
<tr>
<td>UA_WITHDRAWAL</td>
<td>WF Student Withdrawal</td>
<td>LOCAL</td>
<td>12-JAN-2019</td>
</tr>
<tr>
<td>WFTECHNIC</td>
<td>Event used in training</td>
<td>LOCAL</td>
<td>11-NOV-2019</td>
</tr>
</tbody>
</table>
Parameter Group Validation

A parameter group must be defined as a container for the parameters specific to the event.
Parameter Group Definition

- EVENTNAME, PRODUCTTYPE, and WORKFLOWSPECIFICNAME are required parameters.
- Target Parameters match the Business Event parameters.
Event Definition

• Tie the parameter group to the event.
• Mark event as ‘Active’.
Event Simulation

Once the event setup is complete in both systems, you are ready to test firing the event.
Event Simulation

You want to see that the event actually produced a workflow task.

---

**Business Events > External Event Search > External Event Search Results**

**External Event**

- **Event Name:** OUR_GRADAPP_PN
- **Product Type:** Banner
- **Status:** Completed
- **Event Date:** 10-Feb-2014 12:26:09 PM
- **External Source:** SimulatedEventSource
- **External ID:** 10271

### Process Evaluation History

<table>
<thead>
<tr>
<th>Business Process</th>
<th>Organization</th>
<th>Was Process Active?</th>
<th>Passed Guard?</th>
<th>Workflow Definition</th>
<th>Workflow Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUR Graduation Application</td>
<td>Root</td>
<td>Yes</td>
<td>Yes</td>
<td>Root - OUR Graduation Pending - 3</td>
<td>test_simulated_gradapp</td>
</tr>
</tbody>
</table>

### Event Parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ApplicationDate</td>
<td>10-Feb-2014 12:24:56 PM</td>
</tr>
<tr>
<td>CWID</td>
<td>UA1234567</td>
</tr>
<tr>
<td>Level</td>
<td>UG</td>
</tr>
<tr>
<td>SeqNo</td>
<td>1</td>
</tr>
<tr>
<td>TERM</td>
<td>201410</td>
</tr>
</tbody>
</table>
Workflow Model
Workflow Model Context

Model must have context parameters for each variable used within the workflow.
Workflow Model Context

- When determining ‘Required’ parameters, think about the minimum set of information we have at the time of the event that the workflow will require to complete processing.
- If the workflow needs additional information for display/routing/decision making, you can include lookup processes to get additional information as long as you have all the key data.
Workflow Model Components

• Automated Activities
• Email Tasks
• Custom Activities
• Decisions
• Notes
Automated Activities

Create routines to get data required by the workflow.
Business Components
Business Component Query

select spriden_pidm,
       trim(spriden_first_name) || '' || trim(spriden_last_name)
into @pidm, @fullname
from spriden
where spriden_id = @id and spriden_change_ind is null

(Any extra spacing is removed on save).
Email Activities

• Notifications can be set to the workflow user’s email address, or dynamic lists can be generated to send notification to a group.

• Some easy workflow wins are just notification workflows

  some event happens ➔ notify appropriate personnel via email.
Email Activities (example)
Decisions

Routing workflow tasks based on evaluation of some attribute.
Custom Activities

Custom forms - workflow user takes action on a task.
Custom Activities

Can build custom forms plain text or html (no cr/lf).
Automated Activities (revisited)

Can be used for updating data via PL/SQL procedures.

Can also setup a task to have workflow open the appropriate INB form for the user to make the necessary update via INB-Banner.
Automated Activities (revisited)

The `update_degree_status` business component calls a database procedure (or API) to perform the update.
Automated Activities (revisited)

p_UpdateDegreeStatusCode procedure:

```sql
cursor_ref := sb_learneroutcome.f_query_one(pidm, dgmr_seq_no);
fetch cursor_ref into rec;

if new_degree_status in ('ND', 'NC', 'NR', 'DN') then
    v_new_degree_status := 'DN';
    -- denied, or when denied from dept or college

    begin -- attempt to inactivate graduation application
        select max(stvgast_code) into v_inactive_gast_code
            from saturn.stvgast
            where stvgast_active_ind = 'N';

        sb_gradapp.p_update(p_pidm => pidm,
            p_seqno => rec.r_seq_no,
            p_request_date => sysdate,
            p_gast_code => v_inactive_gast_code,
            p_gast_date => sysdate,
            p_user_id => 'WFBANNER');

        sb_learneroutcome.p_update(rec.r_pidm, rec.r_seq_no, v_new_degree_status, rec.r_appl_date,
            rec.r_grad_date, rec.r_acyr_code_bulletin, rec.r_term_code_sturec,
            rec.r_term_code_grad, rec.r_acyr_code, rec.r_grst_code, rec.r_fee_ind, rec.r_fee_date,
            rec.rAuthorized, rec.r_term_code_completed, rec.r_degocode_dual,
            rec.r_levi_code_dual, rec.r_dept_code_dual, rec.r_coll_code_dual, rec.r_majr_code_dual,
            rec.r_user_id, rec.r_data_origin, rec.r_internal_record_id);
```
Package Maintenance

A good practice that your institution should evaluate is to keep all database components of your workflow processes in a separate database schema (WFOBJECTS).
Workflow Model Components

Our most complex workflows are just made up of these four activity types (plus notes).

Notes have been extremely useful in remembering why we made the decisions we did in modeling the workflow.
Workflow Management
User and Role Management

Creating new users is an easy task. Creating new roles is an easy task. Managing what roles a user has access to is a hard task.

• Users may be in multiple roles for a single workflow or for multiple workflows.
• Make sure you evaluate the Owner/Admin roles for your workflow model (ability to “Stop” workflow and view data).
• Include Workflow in your Account management process for new hires, department moves, and terminations.
Versioning

It won’t take long for someone find a flaw or think of an improvement. However …

• Changes to workflows are tedious.
• Must unhook workflow from event to make changes.
• Group multiple requests for change into one migration.
Versioning the Workflow Model

When a workflow model is marked as ‘Active’, you may no longer make changes to it.

- Must create a new version of the workflow model.
- There are likely several workflows existing in a Ready state (not yet completed) that are based on the previous version.
- Those workflows must finish their processing using the previous version and associated components.
Versioning Business Components

When you change a procedure that is called by a business component, it may no longer work with existing workflow tasks created under the previous version.

• Version the business component (give it a new number).
• New version of the business component will be used in the new version of the workflow.
• Workflow tasks from previous version will still call the appropriate version of the business component.
Upgrades

When an upgrade is applied

• Test each workflow model.

• Verify custom activities and email notifications display correctly.

• Ensure CSS modifications are not overwritten. Keep a backup copy of your localized version.

• Review new functionality you may want to incorporate.
CSS modifications

You can adjust the colors of the workflow interface.
CSS modifications

To do this, customize the wfstyle.css on the workflow application server.
CSS modifications

To do this, customize the wfstyle.css on the workflow application server.

Use Firebug to see mods visually before changing on the workflow application server.
Workflow Reports

• Workflows and specific tasks are reportable.
  – Report summary statistics
  – Time to completion
  – Workflow status
  – And more
Workflow Data

- Specific Workflows:
  
  ```sql
  from workflow.eng_workflow w
  where w.name like (:term || '_Graduation_Initial%')
  ```

- Specific Tasks (Item):
  
  ```sql
  (select (date '1970-01-01' + i.start_date / (1000 * 60 * 60 * 24) - (6 / 24))
  from workflow.eng_workitem i
  where i.wf_id = w.id
  and i.pd_id = w.pd_id
  and i.role_id is not null
  and i.name like ('DeptApproval')
  and (date '1970-01-01' + i.start_date / (1000 * 60 * 60 * 24) - (6 / 24)) =
    (select max((date '1970-01-01' + k.start_date / (1000 * 60 * 60 * 24) - (6 / 24)))
    from workflow.eng_workitem k
    where i.wf_id = k.wf_id
    and i.pd_id = k.pd_id
    and k.name like ('DeptApproval')
  )
  ) dept_startdte
  ```
Example Report – Grade Changes

select * from (  
select distinct  
w.id,  
w.name,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'PROF_SPRIDEN_ID') inst_cwid,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'PROF_FULL_NAME') instructor,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'PROF_REASON_FOR_CHANGE') change_reason,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'SCBCRSE_COLL_CODE') coll,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'SCBCRSE_DEPT_CODE') dept,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'SSBSECT_TERM_CODE') term,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'SSBSECT_CRN') crn,  
(select v.value from workflow.eng_properties_values v  
where w.id = v.id and v.name = 'SSBSECT_SUBJ_CODE') subj,  
Pulls properties of the workflow
Example Report (con’t)

```
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'SSBSECT_CRSE_NUMB') crse,
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'SSBSECT_SEQ_NUMB') sec,
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'SHRTCKG_GRDE_CODE_FINALORIGINAL') orig_grde,
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'SHRTCKG_GRDE_CODE_FINALNEW') new_grade,
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'STU_SPRIDEN_ID') stu_cwid,
(select v.value from workflow.eng_properties_values v
 where w.id = v.id and v.name = 'STU_FULL_NAME') stu_name,
(date '1970-01-01' + w.start_date / (1000 * 60 * 60 * 24) - (6 / 24)) start_date,
(date '1970-01-01' + w.stop_date / (1000 * 60 * 60 * 24) - (6 / 24)) stop_date
from workflow.eng_workflow w
where w.name like ('%GRADE%') and
  (select v.value from workflow.eng_properties_values v
   where w.id = v.id and v.name = 'SSBSECT_TERM_CODE') = :term
) order by coll, dept, term, crn, stu_name, start_date
```

Null stop date means wf not completed

Note importance of name
Example Report (con’t)

From the data above, we can:

• Create Summary Tables –
  – How many processed by day, week, month, term
  – College, department

• Find all changes submitted by a particular instructor
  – How many submitted
  – When submitted
  – Reason

• Grade changes pending (null stop date)

• Lag time from submission to approval

• And more