Getting more from Rules Engine

Ruhan Ferreira

29 June 2016
16:45 - 17:30

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Introduction

- Rules Engine allows business users to define specific logic for business processes themselves
- The idea is to avoid "coding" for execution of business logic
- Makes business (functional) users more involved in the processes that they really own

Agenda

- **Delivered trigger points and uses for Rules Engine**
  - Program Enrollment
  - Activity Management
  - Graduate Research Management
  - Evaluation Management
- **Examples of how Rules Engnine can be used outside of these:**
  - File Parser Rule Processor
  - SF Transaction Posting
  - Activity Management Complex Calculations
  - Processing of documents received from ImageNow (Perceptive Content)

File Parser Rule Processor

- Two delivered, isolated pieces of functionality:
  - File Parser
  - Rules Engine
- Both allow for configuration rather than development
- Users usually require some form of **file uploads** to be **developed.**

File Parser Rule Processor

File Parser

Run File Parser

Run Control ID: 1 | Report Manager | Process Monitor | Run

File Mapping ID: UT_EXAM_ADM_COMMA

File Path List — Personalize | Find | First 1 of 1 Last

File Path	File List Indicator

Context Definition | Record Tree

*Context Name: UT_EXAM_ADM — Conversion Definition

Staging Table Records — Find | View All — First 1 of 1 Last

*Record: UT_STG_TESTCMP — Student Test Score Components — Sort Order: 1

Parent Record:

Synchronize Record Fields

Staging Table Fields — Personalize | Find | View All | First 1-8 of 8 Last

Mapping

	Field Name	Field Type	*Mapping Action	Visible for Mapping
1	PROCESS_INSTANCE	Number	No Default	
2	EMPLID	Char	No D	
3	TEST_ID	Char	No D	
4	TEST_COMPONENT	Char	No D	
5	SCORE	Number	No D	
6	TEST_DT	Date	No D	
7	LS_DATA_SOURCE	Char	No D	
8	EXT_ACAD_LEVEL	Char	No D	

File Definition | File Layout | Mapping | Preview Layout | Preview Data

Map Name: UT_EXAM_ADM_COMMA

Row Types — Find — First 1 of 1 Last

Row Type: Detail — Staging Table: — Load Fields

File Fields — Personalize | Find | View All | First 1-10 of 10 Last

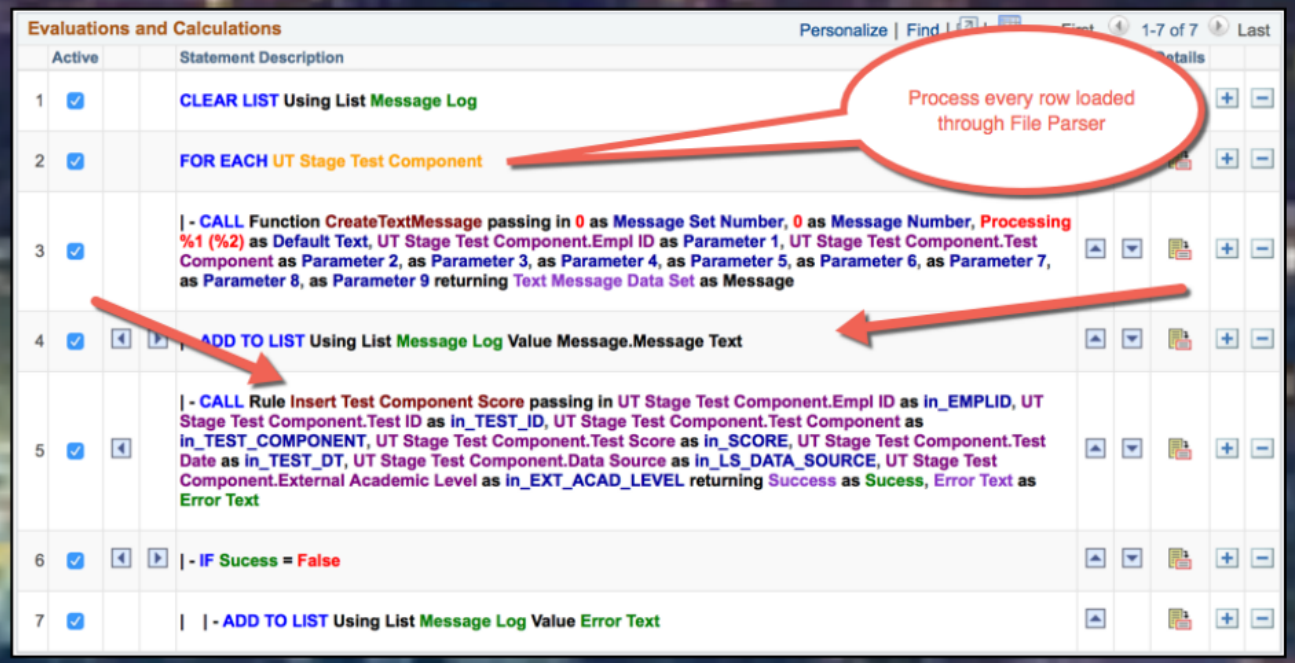
Location | Format

	*Sort Order	*File Field Name	Field Number	Field Type
1	10	EMPLID	2	Character
2	20	NAME	3	Character
3	30	TEST_DT	4	Date
4	40	SCORE_1	5	Number
5	50	SCORE_2	6	Number
6	60	SCORE_3	7	Number
7	70	SCORE_4	8	Number
8	80	SCORE_5	9	Number
9	90	SCORE_6	10	Number
10	100	SCORE_7	11	Number

File Parser Rule Processor

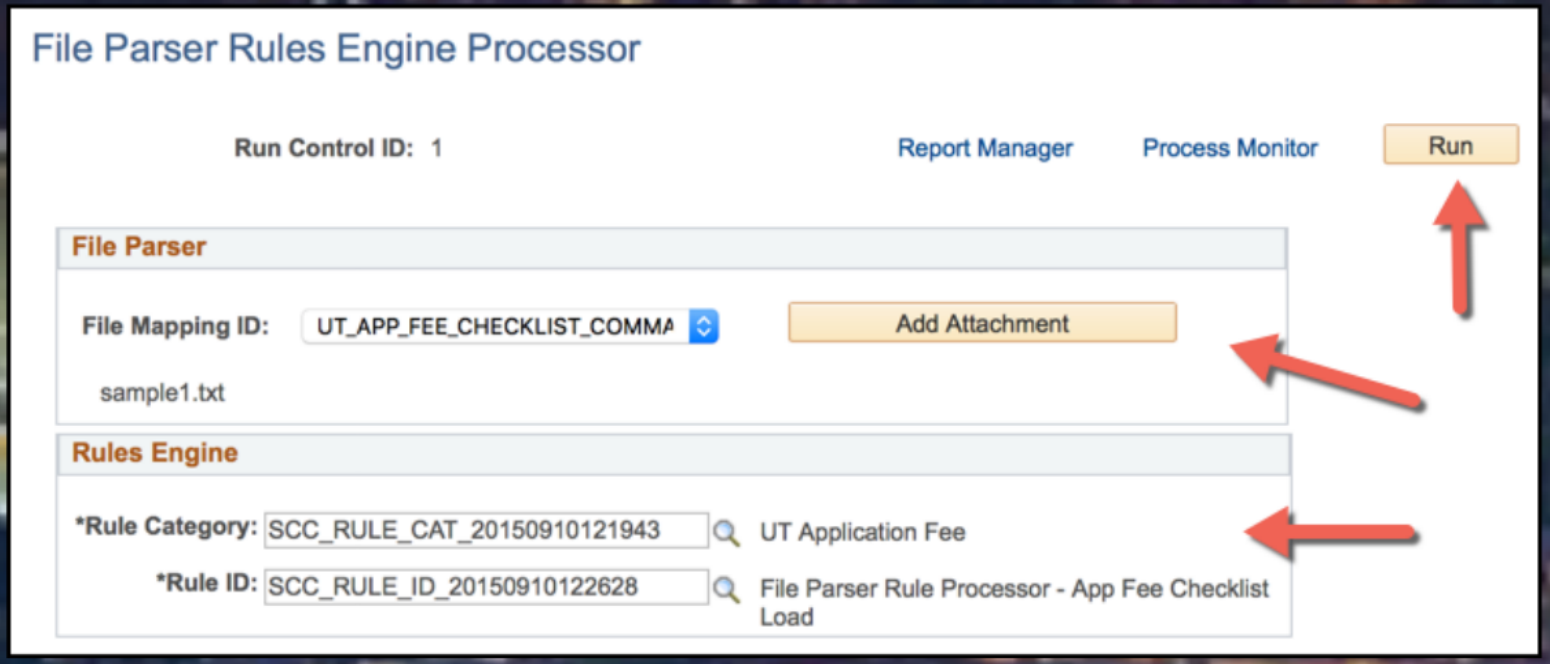
- Data in the staging table needs to be processed
- Usually coded using PeopleCode/CI's
- ...and for every unique file upoad process required
- Rules Engine is perfect for processing data (reading and writing) through entities

Rules Engine



File Parser Rule Processor

New Application Engine process and Run Control Component



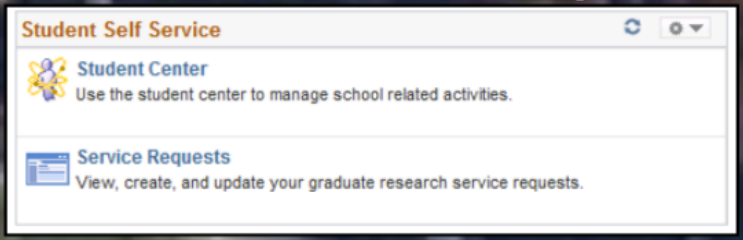
SF Transaction Posting

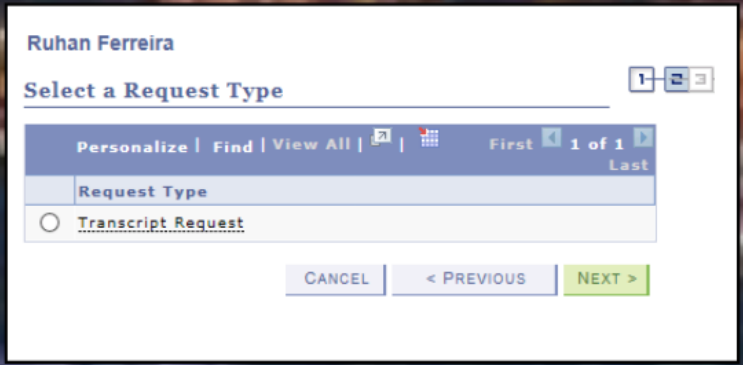
- Custom development is often required for posting student financial transactions
- Done from different trigger points and uses different logic to determine eligible students, item types, amounts etc.
- Two examples of this requirement:
  - Service Request submissions
  - Activity Management Exam Confirmation

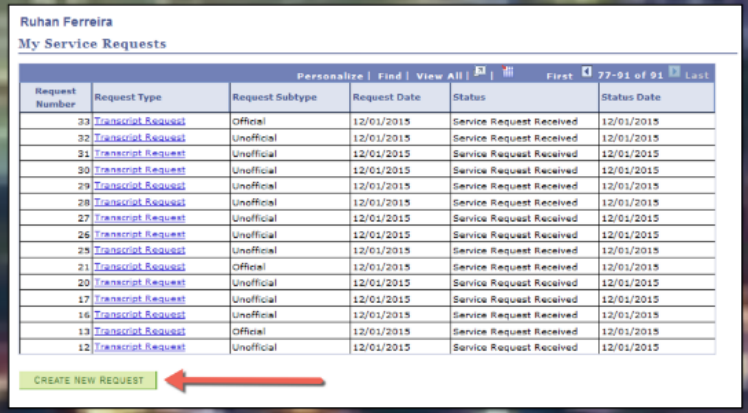
SF Transaction Posting

Service Request Submissions

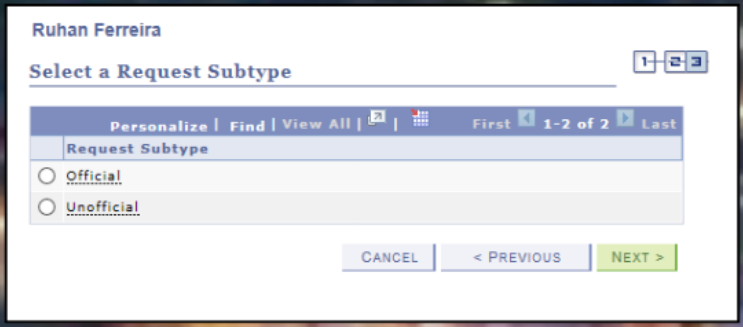
Process and Requirement







Request Number	Request Type	Request Subtype	Request Date	Status	Status Date
33	Transcript Request	Official	12/01/2015	Service Request Received	12/01/2015
32	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
31	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
30	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
29	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
28	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
27	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
26	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
25	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
21	Transcript Request	Official	12/01/2015	Service Request Received	12/01/2015
20	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
17	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
16	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015
13	Transcript Request	Official	12/01/2015	Service Request Received	12/01/2015
12	Transcript Request	Unofficial	12/01/2015	Service Request Received	12/01/2015



Charge Student for specific Service Requests...

SF Transaction Posting

Solution is to call Rules Engine

Business Logic in Rule

Minor Customization

```
   Local SCC_RULES_ENGINE:Util:RuleFactory &sccRuleFactory = create
SCC_RULES_ENGINE:Util:RuleFactory();
   Local SCC_RULES_ENGINE:Util:RuleInterface &sccRuleInterface =
&sccRuleFactory.getRule("SCC_RULE_ID_20151201142525", True);

   /*Input variables*/
   Local string &Emplid;
   Local string &RequestType;
   Local string &RequestSubType;
   Local string &Institution;
   Local number &RequestID;
   Local number &RequestSeq;
   /*Output variables*/
   Local boolean &Success;
   Local string &Error_Message;
   Local number &Amount;

   &Emplid = &rqhdr(1).GetRecord(Record.SSR_RS_REQSTHDR).GetField(Field.EMPLID).Value;
   &RequestType =
&rqhdr(1).GetRecord(Record.SSR_RS_REQSTHDR).GetField(Field.SSR_RS_RQUEST_TYPE).Value;
   &RequestSubType =
&rqhdr(1).GetRecord(Record.SSR_RS_REQSTHDR).GetField(Field.SSR_RS_REQ_SUBTYPE).Value;
   &Institution =
&rqhdr(1).GetRecord(Record.SSR_RS_REQSTHDR).GetField(Field.INSTITUTION).Value;
   &RequestID =
&rqhdr(1).GetRecord(Record.SSR_RS_REQSTHDR).GetField(Field.SSR_RS_REQUEST_ID).Value;

   ObjectSetProperty(&sccRuleInterface, "V0004", &Emplid);
   ObjectSetProperty(&sccRuleInterface, "V0006", &RequestType);
   ObjectSetProperty(&sccRuleInterface, "V0008", &RequestSubType);
   ObjectSetProperty(&sccRuleInterface, "V0011", &Institution);
   ObjectSetProperty(&sccRuleInterface, "V0013", &RequestID);

   &sccRuleInterface.Invoke();

   &Success = ObjectGetProperty(&sccRuleInterface, "V0001");
   &Error_Message = ObjectGetProperty(&sccRuleInterface, "V0002");
   &Amount = ObjectGetProperty(&sccRuleInterface, "V0017");
```

Define Rule | Version History | Cross Reference

Rule ID	SCC_RULE_ID_20151201142525	Action	
Version	2	Rule Build Status	Build Successful
Rule Status	Active	Status Last Date/Time	06/15/2016 3:13PM PDT
*Rule Name	Service Request Submission Trigger		
*Long Description	Service Request Submission Trigger		
Rule Category Name	UT Student Records		
*Rule Group Name			
*Rule Usage	Trigger		
*Skill Level	Expert		

```
34  | | - IF out_AMOUNT > 0
35  | | | - CALL Rule Get Item Type Account passing in UCAN1 as in_SETID, Item Type as in_ITEM_TYPE returning
    out_ACCOUNT_TYPE_SF as Account Type
36  | | | - CALL Rule PostStudentTransaction passing in UCAN1 as BusinessUnit, in_EMPLID as Emplid, Account Type
    as AccountType, Item Type as ItemType, SR Charge - Program as Reference, Space as Term, out_AMOUNT as
    Amount returning Success as Success, ErrorMessage as Error Message
37  If amount is 0 after processing, use the associated Course ID, Academic Program and Service Request Type to
    search for an item type associated with this combination
38  IF out_AMOUNT = 0
39  | - CALL Rule Get Item Type by Attributes passing in Course ID as in_CRSE_ID, Academic Program as
    in_ACAD_PROG, in_SSR_RS_RQUEST_TYPE as in_SSR_RS_RQUEST_TYPE, Academic Group as in_ACAD_GROUP
    returning out_ITEM_TYPE as Item Type
40  | - IF Item Type <> Space
41  | | - CALL Rule Get Item Type Default Amount passing in UCAN1 as in_SETID, Item Type as in_ITEM_TYPE returning
    out_DEFAULT_AMT as out_AMOUNT
42  | | - IF out_AMOUNT > 0
43  | | | - CALL Rule Get Item Type Account passing in UCAN1 as in_SETID, Item Type as in_ITEM_TYPE returning
    out_ACCOUNT_TYPE_SF as Account Type
44  | | | - CALL Rule PostStudentTransaction passing in UCAN1 as BusinessUnit, in_EMPLID as Emplid, Account Type
    as AccountType, Item Type as ItemType, SR Charge - Item Type as Reference, Space as Term, out_AMOUNT as
    Amount returning Success as Success, ErrorMessage as Error Message
45  If amount is still 0 after all processing, set the status to success
46  IF out_AMOUNT = 0
47  | - ASSIGN Success = True
```

SF Transaction Posting

Activity Management Exam Confirmation

Ruhan Ferreira

Overview | Planning | Enrollment | Results

my schedule builder | my classes | my activities | my exams | resit exam selection

My Activities

Universidade Catolica - Angola | DIG01: Direito CHANGE PROGRAM

Universidade Catolica - Angola | Undergraduate | Ano A DIG01: Ano 1

Show Activity Details

EXPAND ALL COLLAPSE ALL

Activities	Status	Assessed	Select	Confirm	Due Date	Weight	Result Scale	Passing Mark	Passing Grade	Mandatory Pass	Attachments
CJPF 1101: H. Das Ideias Polit. E Jrdicas	Enrolled	Yes				1.00	20PT	10			Attachments
ECON 1001: Introdução À Economia	Enrolled	Yes				1.00	20PT	10			Attachments
ETIC 1202: Cristianismo E Desenvolvimento	Enrolled	Yes				1.00	20PT	10			Attachments
CJPR 1001: Intr. Ao Estudo Do Direito	Enrolled	Yes				1.00	20PT				Attachments
Assessment Items	Assigned	Yes				1.00	20PT				Attachments
Continuous Assessment	Assigned	Yes				2.00	20PT				Attachments
Frequency Assessment	Assigned	Yes				3.00	20PT				Attachments
Exam	Assigned	Yes				1.00	20PT				Attachments
Exam Section	Enrolled	Yes				1.00	20PT				Attachments
Supplementary Exam	Assigned	Yes				1.00	20PT				Attachments
Supplementary Exam Section	Enrolled - Confirmed	Yes	☑	☑		1.00	20PT				Attachments
Grade Improvement Exam	Assigned	Yes				1.00	20PT				Attachments
Grade Improvement Exam Section	Enrolled - Confirmed	Yes	☑	☑		1.00	20PT				Attachments

Define Rule | Version History | Cross Reference

Rule ID	SCC_RULE_ID_20160414231129	Action	
Version	1	Rule Build Status	Build Successful
Rule Status	Active	Status Last Date/Time	06/13/2016 12:23PM PDT
*Rule Name	Activity Management Confirmation Trigger		
*Long Description	Activity Management Confirmation Trigger		
Rule Category Name	UT AM Calculation Rules		
*Rule Group Name			
*Rule Usage	Trigger		
*Skill Level	Expert		
Entity Name			
*Logging Level	No Message Logging		

☑ Available To Be Used

```
15  IF in_SSR_EXAMTYP_TBL = I1
16  | - CALL Rule Get Course Catalog CAF passing in in_CRSE_ID as in_CRSE_ID, UT_I1_ITEM_TYPE as
    in_SCC_CAF_ATTRIB_NM returning out_SCC_CAF_ATTR_VAL as Item Type, out_SCC_CAF_ATTR_NVAL as Dummy
    Number
17  | - CALL Rule Get Course Catalog CAF passing in in_CRSE_ID as in_CRSE_ID, UT_I1_AMOUNT as
    in_SCC_CAF_ATTRIB_NM returning out_SCC_CAF_ATTR_VAL as Dummy Text, out_SCC_CAF_ATTR_NVAL as
    out_AMOUNT
18  | - IF out_AMOUNT > 0
19  |  | - CALL Rule PostStudentTransaction passing in UCAN1 as BusinessUnit, in_EMPLID as Emplid, TUT as
    AccountType, Item Type as ItemType, Grade Impr 1 Charge as Reference, Space as Term, out_AMOUNT as Amount
    returning Success as Success, ErrorMessage as Error Message
20  For grade improvement exam 2, get the item type and amount
21  IF in_SSR_EXAMTYP_TBL = I2
22  | - CALL Rule Get Course Catalog CAF passing in in_CRSE_ID as in_CRSE_ID, UT_I2_ITEM_TYPE as
    in_SCC_CAF_ATTRIB_NM returning out_SCC_CAF_ATTR_VAL as Item Type, out_SCC_CAF_ATTR_NVAL as Dummy
    Number
23  | - CALL Rule Get Course Catalog CAF passing in in_CRSE_ID as in_CRSE_ID, UT_I2_AMOUNT as
    in_SCC_CAF_ATTRIB_NM returning out_SCC_CAF_ATTR_VAL as Dummy Text, out_SCC_CAF_ATTR_NVAL as
    out_AMOUNT
24  | - IF out_AMOUNT > 0
25  |  | - CALL Rule PostStudentTransaction passing in UCAN1 as BusinessUnit, in_EMPLID as Emplid, TUT as
    AccountType, Item Type as ItemType, Grade Impr 2 Charge as Reference, Space as Term, out_AMOUNT as Amount
    returning Success as Success, ErrorMessage as Error Message
26  If amount is still 0, set the success to true
27  IF out_AMOUNT = 0
28  | - ASSIGN Success = True
```

Common Attribute Framework

Catalog Data | Offerings | Components | GL Interface

Course ID: 000436

Find | View All First 1 of 1 Last

*Effective Date: 01/01/1901 *Status: Active

Course Offering 1 of 1

CBIB 1101

*Description: Introdução À Bíblia

Long Course Title: Introdução À Bíblia

Long Description:

Course Units/Hours/Count

Minimum Units: 3.00
Maximum Units: 3.00
Academic Progress Units: 3.00
Financial Aid Progress Units: 3.00

Last Course of Mult Term Seq: ☐
*Enrollment Unit Load Calc Type: Actual Units
Course Count: 1.00
Course Contact Hours: 0.00

Course Grading

*Grading Basis: Graded
Graded Component: Lecture
*Grade Roster Print: Component

Repeat for Credit Rules

☐ Repeat for Credit
☐ Allow Multiple Enroll in Term

Total Units Allowed: 3.00
Total Completions Allowed: 1

Additional Course Information

*Instructor Edit: No Choice
*Add Consent: No Consent
Requirement Designation:
Equivalent Course Group:
*Drop Consent: No Consent

Attributes

Attributes

Item Type:	100000000010	Inglês Técnico I
Amount:	100.20	
Supp 1 Item Type:	100000000002	Francês I
Supp 1 Amount:	200.00	
Supp 2 Item Type:	100000000003	Técnicas De Expressão Do Pt I
Supp 2 Amount:	300.00	
Grade Imp 1 Item Type:	100000000004	Português
Grade Impr 1 Amount:	400.00	
Grade Impr 2 Item Type:	100000000005	Português I
Grade Impr 2 Amount:	500.00	

OK Cancel

Activity Management Complex Calculations

Registry Header | Registry Detail | Content Tree

Activity Registry ID: C-00000000008
Institution: UCAN1

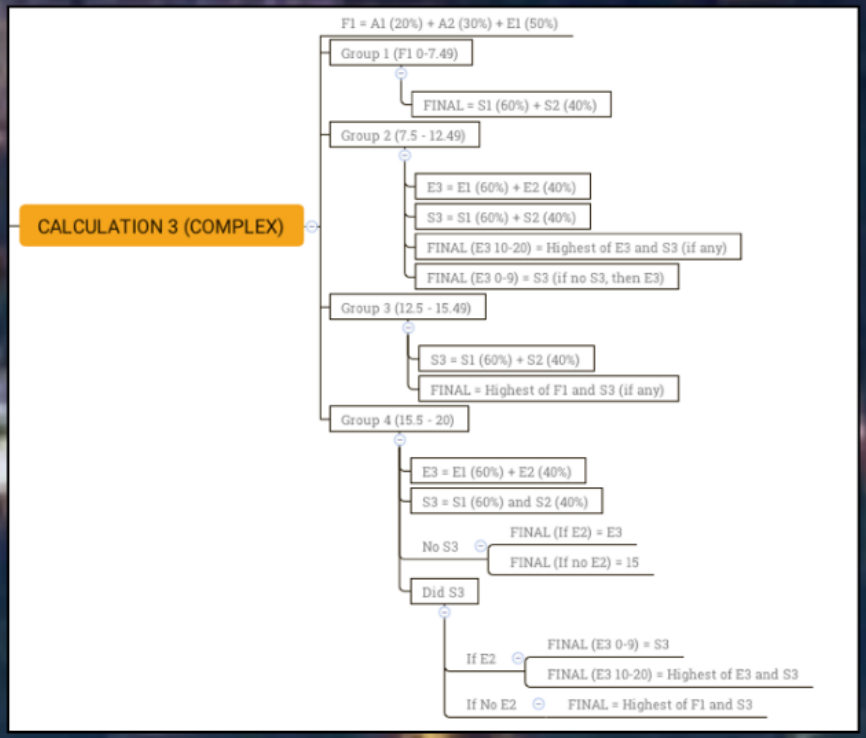
Registry Header Definition — Find | View All — First 1 of 1 Last

Effective Date: 01/01/1901 **Status:** Active
Content Definition: Coursework
Description: UCAN Complex Sample

Content Tree

Collapse All — Display Item ID

Expand / Collapse	Content Description	Display row
⊟	Course	
⊟	¦- Interim Result	
⊟	¦ ¦- Assessment Category	
	¦ ¦ ¦- Continuous Assessment	
	¦ ¦ ¦- Frequency Assessment	
	¦ ¦- Exam	
	¦ ¦- Oral Exam	
⊟	¦ ¦- Supplementary Category	
	¦ ¦ ¦- Written Supplementary Exam	
	¦ ¦ ¦- Oral Supplementary Exam	
⊟	¦ ¦- Grade Improvement Category	
	¦ ¦ ¦- Written Grade Improvement Exam	
	¦ ¦ ¦- Oral Grade Improvement	



Activity Management Complex Calculations

Evaluations and Calculations — Personalize | Find | First 1-12 of 12 Last

	Active			Statement Description	Details
1	☑			IF ActivityRegistryID = C00000000008	
2	☑			| - IF ContentItemID = ITX000020	
3	☑			| | - CALL Rule UT AM Primary Course Result - Complex passing in AM Results as AM Results, Precision as Precision, DecimalOption as DecimalOption, ActivityRegistryID as ActivityRegistryID, ContentItemID as ContentItemID returning Result as Result	
4	☑	◀	▶	| | - EXIT RULE	
5	☑	◀		| - ELSE *IF ContentItemID = ITX000020*	
6	☑			| | - CALL Rule AM Primary Course Result passing in AM Results as AM Results, Precision as Precision, DecimalOption as DecimalOption returning Result as Result	
7	☑	◀	▶	| | - EXIT RULE	
8	☑			ELSE *IF ActivityRegistryID = C00000000008*	
9	☑			| - IF ContentItemID = ITX000010	
10	☑			| | - CALL Rule UT AM Primary Course Result - Simple passing in AM Results as AM Results, Preci Precision, DecimalOption as DecimalOption, ActivityRegistryID as ActivityRegistryID, ContentItem ContentItemID returning Result as Result	
11	☑	◀	▶	| | - EXIT RULE	
12	☑		▶	CALL Rule AM Primary Course Result passing in AM Results as AM Results, Precision as Precision, DecimalOption as DecimalOption returning Result as Result	

Delivered AM Calculation

21	☑		| - IF Final 1 < 12.5
22	☑		| | - IF Exam 3 >= 10
23	☑		| | | - IF Exam 3 > Supplementary
24	☑		| | | | - ASSIGN Result = Exam 3
25	☑	◀	| | | - ELSE *IF Exam 3 > Supplementary*
26	☑		| | | | - ASSIGN Result = Supplementary
27	☑	◀	| | - ELSE *IF Exam 3 >= 10*
28	☑		| | | - IF Supplementary > 0
29	☑		| | | | - ASSIGN Result = Supplementary
30	☑	◀	| | | - ELSE *IF Supplementary > 0*
31	☑		| | | | - ASSIGN Result = Exam 3
32	☑		| - ELSE *IF Final 1 < 12.5*
33	☑		| | - IF Final 1 <= 15.5
34	☑		| | | - IF Final 1 > Supplementary
35	☑		| | | | - ASSIGN Result = Final 1
36	☑	◀	| | | - ELSE *IF Final 1 > Supplementary*
37	☑		| | | | - ASSIGN Result = Supplementary

Processing of documents received from ImageNow (Perceptive Content)

Define Rule | Version History | Cross Reference

Rule ID	SCC_RULE_ID_20141218180256	Action	
Version	1	Rule Build Status	Build Successful
Rule Status	Active	Status Last Date/Time	18/02/2015 5:00PM PST
*Rule Name	UCT ImageNow Document Handler		
*Long Description	UCT ImageNow Document Handler		
Rule Category Name	UCT Application Review		
*Rule Group Name			
*Rule Usage	Rule		
*Skill Level	Expert		
Entity Name			
*Logging Level	No Message Logging		

☑ Available To Be Used

Variables — Personalize | Find | View All | First 1-10 of 24 Last

Variable Name	Type	List	System	Input	Output	Required	Count	Details
Drawer	Text	☐	☐	☑	☐	☑	1	
Field1	Text	☐	☐	☑	☐	☑	3	
Field2	Text	☐	☐	☑	☐	☐	0	
Field3	Text	☐	☐	☑	☐	☐	0	
Field4	Text	☐	☐	☑	☐	☐	0	
Field5	Text	☐	☐	☑	☐	☐	1	
DocType	Text	☐	☐	☑	☐	☑	2	
Choice1 Acad Prog	Text	☐	☐	☑	☐	☐	0	
Choice1 Prog Action	Text	☐	☐	☑	☐	☐	0	
Choice1 Prog Reason	Text	☐	☐	☑	☐	☐	0	

Evaluations and Calculations — Personalize | Find | First 1-27 of 27 Last

	Active	Statement Description	Details
1	☑	ASSIGN Result = Success, Reason = No Processing Required	
2	☑	IF Drawer = Admissions	
3	☑	| - IF Source = SS Or Source = MR	
4	☑	| | - CALL Rule UCT update document status passing in Field1 as EmplID, Creation Date as Creation Date returning Success as Success	
5	☑	| | - IF Success = True	
6	☑	| | | - ASSIGN Reason = Admissions Processed	
7	☑	| | - ELSE *IF Success = True*	
8	☑	| | | - ASSIGN Reason = Admissions Failed, Result = Error	
9	☑	| - IF (Source = SS Or Source = MR) And Result = Success	
10	☑	| | - CALL Rule UCT update document outstanding evaluation passing in Field1 as EmplID, UCT01 as Institution, Adm Appl Nbr as ApplicationNumber, DocType as DocumentType, Creation Date as CreationDate returning Success as Success	
11	☑	| | - IF Success = True	

Questions, Comments, Ideas etc...

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