MIS 5121: Enterprise Resource Planning Systems
Week 8: Review, Authorizations -2, Inventory Controls
Control Failure: Dongxue’s Presentation

• **Background:**
  ❖
  ❖

• **Control Failures: 2006 – 2009**
  ❖
  ❖

• **Results:**
  ❖
  ❖

• **Reference:**
  ❖
Control Failure: Brandon’s Presentation

• **Background:**
  ✤
  ✤

• **Control Failures: 2006 – 2009**
  ✤
  ✤

• **Results:**
  ✤
  ✤

• **Reference:**
  ✤
Control Failure: David R’s Presentation

• **Background:**
  ❖
  ❖

• **Control Failures: 2006 – 2009**
  ❖
  ❖

• **Results:**
  ❖
  ❖

• **Reference:**
  ❖
MIS 5121: Upcoming Events

• Reading Assignment 5 - *Due: March 15*
• Exercise 3 (Journal Entries) - *Due: March 19*
• Reading Assignment 6 - *Due: March 29*
• Class Visitors: auditors - *March 30*
  – Ernst & Young – auditing manager and SAP subject matter expert
  – Discussion / Q&A format (~30 minutes)
  – Gather discussion topics and your ?’s next week
MIS 5121: Auditor’s Visit Topics

• Have you personally detected a fraud scenario in your audit? If so, please explain.

• What are the general methodologies used for auditing?

• Does SAP provide good control environment vs. other systems (ERP, other)?

• How to you maintain your independence? Is that easy?

• What is your opinion on cyber-security laws being considered by the US government (CIA, CISA legislation)?

• How easy is it for the auditors to commit fraud?

• How do you classify risks?

• Since SAP can be customized in so many ways, how does an auditor know what to audit when everything is different with each client?

• How do they review Segregation of Duties (modules vs. employees)?
MIS 5121: Auditor’s Visit Topics

• What does the auditor do to identify risks associated with SAP ERP?
• Is automation of reporting and business transactions better or worse for compliance?
• Do you think the SAP P2P auditing process is too labor intensive to set up and maintain for small to mid size companies? Maybe a small scale ERP system would be a better fit.
• The security mechanisms of SAP look complex and safer than other systems (e.g. with roles, profiles, authorizations, etc.) However, has the implementation of SAP really reduced the chance or number of frauds (e.g. are there any statistics to support this hypothesis?)
• Within the financial accounting system of SAP, what area or field presents the most risk or the greatest opportunity for fraud?
Review: Key topics to remember (i.e. may be on a future test)
Exam 1: Results

• Some questions really ‘bad’ (unfair, worded poorly)
• Results will be ‘curved’ to red high score vs. perfect score of 36
• My Challenge: distill 30+ years experience into curriculum and then how to test understanding
Exam 1: Actions

• Quick Review of ‘key’ concepts, Lessons (Next week)
  – Not reteach, just review
  – Will be included in Exam 2 and Final

• Formulate exam questions along with curriculum content
  – Will emphasize during class
    • ‘This will be on the exam’
    • Review / Key lessons slides after each lecture section
ISC framework in the ERP environment
- Entity level controls
- Automated application controls
- Manual and semi-automated business process controls
- Authorizations and access protection (confidentiality, integrity)
- IT General controls (change management, operation, security)
- Automated testing and monitoring of business processes, KPIs, etc.
Risks / Controls

• **All** slides, discussions, content related to Risks and related controls
  – Don’t need to memorize every example
  – Understand what is a risk vs. what is a control
  – Do remember a few examples of risks and controls in each area discussed
    • Procure to Pay Process
    • Order to Cash Process
    • Master Data
    • Financial Processes
    • Inventory
Business Functions / Organization

- Marketing / Sales
  - Customer Service
- Supply Chain
  - Warehouse Distribution
  - Conversion
  - Procurement
- Finance / HR
  - Billing
  - Accounts Receivable
  - Accounts Payable
Business Process Vs. Function

Function
‘An operation / group of relate tasks) that is performed routinely to carry out a part of the mission of an organization..’

Process
‘A series of logically related activities / tasks performed together (although usually not by same person / organization / function) to produce a defined set of results.’
Business Processes

- Sales
- Order to Cash
- Procurement to Pay
- Supply Chain Planning
- Manufacturing / Production
- Innovate / Commercialize
- People / Human Resources
- Finance / Record and Report
Procurement Process
Order to Cash Process
Assertion

Definition

‘a confident and forceful statement of fact or belief’

Oxford Dictionaries

In Auditing: ‘what management claims’
Management Assertions

Taxonomy for class (along with definitions)

- Occurrence / Existence (timing)
- Completeness
- Accuracy / Valuation
- Rights (Ownership)
- Summarization / Presentation
The existence of controls imply the existence of assertions.
Environment Favorable to Fraud
Framework for spotting high-risk situations

- **Perceived opportunity** (*I can do it / conceal it and not get caught*)
  - Poor internal controls
  - Lack of oversight

- **Incentive or Pressure** (*Financial or emotional force pushing to commit fraud*)
  - Meet expectations
  - Avoid criticism
  - Cover a mistake
  - Personal failures, needs

- **Rationalization** (*Personal justification for dishonest actions*)
  - Low compensation
  - Company is profitable

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Fraud Triangle
Control Definition Outline

- **Reference #** Unique, assigned reference #
- **Control Activity** Summary of control activity
- **Process** Owning Process (Can only be 1)
- **Sub-Process**
- **Location** Where activity occurs
- **Frequency**
  - X: Multiple times a day
  - D: Daily
  - W: Weekly
  - M: Monthly
  - Q: Quarterly
  - A: Annual
- **Control Activity (Typically for Manual Controls)**
  - R: Reconciliation
  - A: Authorization
  - S: SOD/Safeguarding
  - M: Monitoring/ Review
  - P: Processing

- **Control Owner Title** Title of person responsible for completing the control
Control Type Dimensions

• **Automated**: System automatically implements the control
  – Example: Gross weight > Net weight; Time zone based on State, Pre-defined values for fields
  
  – Use When: System basic logic; Configurable; Application ‘Rules’ match Business Rules; Easy development to implement
  
  – Do not use: Complex business rules (hard to implement)

• **vs. Manual**: Defined procedure followed to implement control
  – Example: Use system report to assure reconciliations, verifications are complete; validate system matches manual input form
  
  – Use When: No System capability, Requires human decision making
  
  – Do not Use: If system can handle automatically
Control Type Dimensions

A. **Directive**: Policies / Procedures / Training
   - Example: Formal Credit policy, Period closing ‘rules’
   - Use When: Almost all areas to define expectations, ‘rules’
   - Do not use: As only control, in highly complex decision making scenarios (provide outline / guidelines only).

B. **Compensating**: employ in lieu of the recommended controls in the low, moderate risk situations to provide equivalent or comparable protection
   - Example: Review Sample of transactions (e.g. High value, high risk), secondary approval for certain Scenarios
   - Use When: Segregation of Duties is difficult / impossible to implement fully.
   - Do not Use: Large organizations, high risk SOD issues,
Control Type Dimensions

C. **Detective**: After the fact detection of control failure or not
   – Example: Exception reports; reconciliation procedures, Physical checks
   – Use When: No preventative control possible or is cost prohibitive, Current process
   – Do not use: If preventable, or system control (e.g. config, easy development) possible

D. **Preventative**: Prevent from occurring
   – Example: Security / Segregation of Duties protection
   – Use When: Easily implemented with system capability
   – Do not Use: If increases complexity of performing tasks with minimal prevention
Master Data

Customer Master

Material Master

Vendor Master

Versus

Transactions flow down the river of time
Enterprise Security Architecture

• Behind the scenes, end users navigate through layers of security to reach the SAP Application

• A Security Team generally handles all activities related to SAP Application Security

• SAP Security Team works with IT Team to ensure appropriate security is implemented at levels: Database, System (e.g. Unix), Host and Network
SAP Instances vs. Clients

Instances . . .

[Diagram of SAP instances and clients process]
Typical SAP Landscape

Development System
- **Type of users:** Developers, Consultants, Key Users
- **Type of work:** Customizing, Development, Unit Testing

Quality-Assurance System
- **Type of users:** Developers, Consultants, Key Users
- **Type of work:** Integration and Quality testing

Production System
- **Type of users:** End users
- **Type of work:** Productive execution of transactions with real business data

Developments, corrections & customizing settings
SAP Security: Review

- Program
- User ID

_____ : Authorization Object

Authorization Values

_____ : Authorization Checks

_____ : Authorization Fields

_____ : Roles / Profiles
SAP Security: Review

Program

Lock: Authorization Object

Imbedded In

Core: Authorization Checks

Tumblers: Authorization Fields

Keys: Roles / Profiles

User ID

Assigned To
SAP Security: Business vs. Technical View

**Business View**
- Employee
- Job
- Task
- Privileges
  - Activities
  - Business Structure

**SAP Technical View**
- User Master Record
- Roles / Profiles
- Transaction Code in roles / profiles
- Authorizations
  - Object
    - Fields
      - Values
SAP Security: Logic to Access

- Check Transaction Code
  - Pass
  - Fail
- Check Object
  - Pass
  - Fail
- Within Program
  - Pass
  - Fail
- Transaction Code Executed

“No Authorization for
- Transaction Code _____

“No Authorization for
- Transaction Code _____
- Activity ...
- System Element ...

“No Authorization for
- Activity ....
- System Element ....
Security: SAP Authorization Concept (Continued)
Profile Generator

• PFCG tool used for security design and configuration
  – Simplifies and speeds creation of authorizations by automating various processes
  – Replaces manual creation and maintenance of simple profiles
  – Authorization profiles are created and updated when Roles are generated
  – Roles are set-up at Job Function and Task Level.
  – Each role may contain several activities
  – Driven by transaction codes (select these first – aligned authorization objects, etc. get pulled along)
  – Each Role assigned a unique SAP internal number
Using Profile Generator

- Transaction: **Tools ➔ Administration ➔ User Maintenance ➔ Role ➔ Roles** (PFCG)

![Role Maintenance](image)

Menu ➔ Role ➔ Create ➔ Role (F5)
Profile Generator: Menu Tab

- Click the **Menu** Tab to enter transaction Codes.
Profile Generator: Transaction Folder

Move transactions into folder.
Profile Generator: Authorizations Tab
# Master and Derived Roles

<table>
<thead>
<tr>
<th>Master Roles</th>
<th>Derived Roles</th>
<th>Authorization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serve as templates.</td>
<td>User to enforce organizational level restrictions (company, sales org, plant, etc.)</td>
<td>Structural / Information changes (e.g. new transaction) maintained at master level and ‘pushed’ down to derived roles</td>
</tr>
<tr>
<td>Usually not assigned to Users</td>
<td>Inherit characteristics from their linked master roles. Very similar to each other with only slight differences (in org elements assigned)</td>
<td>Structural / Information changes (e.g. new transaction) maintained at derived level will break the master $\Leftrightarrow$ derived role link</td>
</tr>
<tr>
<td>Organizational elements</td>
<td>Organizational elements maintained at the derived role level</td>
<td>Changes to either master or derived roles need to be mass transported (across instances)</td>
</tr>
</tbody>
</table>
Master and Derived Roles

- Multiple levels in role hierarchy possible
Profile Generator: Derived Roles

Create Roles

Role:
- Role: Z_TEST_GBI_DERIVED
- Description: Test GBI Authorization: Derived
- Target System: 

Administration Information:
- Created:
- User:

Transaction Inheritance:
- Derive from Role: Z_TEST_GBI

SAMPLE AUTHORIZATION - GBI CASE (Master)
Profile Generator: Derived Roles

Note Transaction details (in Menu Tab) and Authorizations flow to Derived Role

'Vessing' Fields (multiple Auth's) can be defined once
Profile Generator: Derived Roles
Profile Generator: Derived Roles

Information About Authorization Profile

Profile Name
Profile Text
Status: Current version not generated

Maintain Authorization Data and Generate Profiles

Change Authorization Data

Expert Mode for Profile Generation

Define Maintenance Type

What action do you want to execute?
- Delete and recreate profile and authorizations
- Edit old status
- Read old status and merge with new data

If the role menu has changed, then 'merge' is correct
SAP Authorization Concept Overview (2)

• Profile Generator (via roles)
  – Can Speed / semi-automate Security process
  – Transaction Driven

• Master – Derived Roles
  – Definitions and ‘Rules’ slide

• Need to proceed with design in mind
Business Controls: Inventory
Control Failure: ‘One Piece at a Time’

• **Background:**
  - Johnny Cash Song about an auto worker on the Cadillac Assembly Line

• **Control Failure: 1949 – 197?**
  - Continual theft of auto parts from assembly line (multiple years)
  - Threat of punishment existed but obviously controls didn’t find the missing engine, transmission, ....

• **Results:**
  - ‘Free’ Cadillac car build from parts
  - Fictitious story? Could this really happen?

• **Reference: Fictitious Story?**
  - Johnny Cash 'One Piece at a Time'
‘One Piece at a Time’

Well, I left Kentucky back in forty nine
An' went to Detroit workin' on a 'sembly line
The first year they had me puttin' wheels on Cadillacs
  Every day I'd watch them beauties roll by
And sometimes I'd hang my head and cry
'Cause I always wanted me one that was long and black.

  One day I devised myself a plan
That should be the envy of most any man
I'd sneak it out of there in a lunchbox in my hand
Now gettin' caught meant gettin' fired
But I figured I'd have it all by the time I retired
I'd have me a car worth at least a hundred grand.

  I'd get it one piece at a time
And it wouldn't cost me a dime
You'll know it's me when I come through your town
I'm gonna ride around in style
I'm gonna drive everybody wild
'Cause I'll have the only one there is around.
‘One Piece at a Time’

So the very next day when I punched in
With my big lunchbox and with help from my friends
I left that day with a lunch box full of gears
I've never considered myself a thief
But GM wouldn't miss just one little piece
Especially if I strung it out over several years.

The first day I got me a fuel pump
And the next day I got me an engine and a trunk
Then I got me a transmission and all the chrome
The little things I could get in my big lunchbox
Like nuts, an' bolts, and all four shocks
But the big stuff we snuck out in my buddy's mobile home.

Now, up to now my plan went all right
'Til we tried to put it all together one night
And that's when we noticed that something was definitely wrong.

The transmission was a fifty three
And the motor turned out to be a seventy three
And when we tried to put in the bolts all the holes were gone.
'One Piece at a Time'

So we drilled it out so that it would fit
And with a little bit of help with an adapter kit
We had that engine runnin' just like a song
Now the headlight' was another sight
We had two on the left and one on the right
But when we pulled out the switch all three of 'em come on.

The back end looked kinda funny too
But we put it together and when we got through
Well, that's when we noticed that we only had one tail-fin
About that time my wife walked out
And I could see in her eyes that she had her doubts
But she opened the door and said "Honey, take me for a spin."

So we drove up town just to get the tags
And I headed her right on down main drag
I could hear everybody laughin' for blocks around
But up there at the court house they didn't laugh
'Cause to type it up it took the whole staff
And when they got through the title weighed sixty pounds.
‘One Piece at a Time’

I got it one piece at a time
And it wouldn't cost me a dime
You'll know it's me when I come through your town
I'm gonna ride around in style
I'm gonna drive everybody wild
'Cause I'll have the only one there is around.

Ugh! Yeah, RED RYDER
This is the COTTON MOUTH
In the PSYCHO-BILLY CADILLAC Come on

     Huh, This is the COTTON MOUTH

And negatory on the cost of this mow-chine there RED RYDER
You might say I went right up to the factory
And picked it up, it's cheaper that way
Ugh!, what model is it?

     Well, It's a '49, '50, '51, '52, '53, '54, '55, '56
'57, '58' 59' automobile
It's a '60, '61, '62, '63, '64, '65, '66, '67 '68, '69, '70 automobile.

• Songwriters: KEMP, WAYNE
• © Sony/ATV Music Publishing LLC
• For non-commercial use only.
• Data From: LyricFind
Environment Favorable to Fraud
Framework for spotting high-risk situations

- **Perceived opportunity** *(I can do it / conceal it and not get caught)*  
  - Poor internal controls  
  - Lack of oversight  

- **Incentive or Pressure** *(Financial or emotional force pushing to commit fraud)*  
  - Meet expectations  
  - Avoid criticism  
  - Cover a mistake  
  - Personal failures, needs  

- **Rationalization** *(Personal justification for dishonest actions)*  
  - Low compensation  
  - Company is profitable
Inventory: Not all the Same

- Bulk vs. Packaged
- Produced vs. Purchased
- Finished vs. Intermediates vs. Supplies
- Trading Goods (Purchased to be resold)
- Valued vs. non-valued
- Owned vs. not (e.g. leased, responsible for)

Impacts
- Valuation
- Handling (e.g. related configuration)
- How Counted
Inventory: Quantities

Inventory Record Accuracy: Does Physical inventory match system records

- Material / Batch
- Quantity
- Location

Method: Physical Counting

- Periodic (e.g. yearly, quarterly, ...) Frequency can depend on risk (e.g. value)
- Complete Count?
- If ‘miss’ someone else Adjusts Records based on Count
Inventory: Quantities

Inventory Record Accuracy: Does Physical inventory match system records

Methods: Cycle Counting

- **Continuous** counting of sections of inventory
- Hit or Miss based on tolerances (e.g. zero for package, +/- for bulk)
- If ‘miss’ someone else Adjusts Records based on Count
- Root cause analysis of reason and correction for ‘miss’
- Track IRA % (# Hits / # checks)
- Acceptable alternative for full physical counts

Common Issue: timing of physical moves vs. system recording
Inventory: Values

**SAP: Valuation Control**
- Controlled by Material Master
- Non-Split Valuation
  - One (1) value by:
    - Material
    - Company or plant (depending config)
  - Valuation Methods
    - Not-valued (e.g. not owned, value is expenses vs. asset)
    - Standard Price (constant based on how procured / produced)
    - Moving Average (changes based on delivered price)
Inventory: Values

**SAP:** Split Valuation

- Material master for each Material / Valuation Type
  - Header record for each Material / Valuation Category created
  - Moving Average Price only calc method allowed
  - Stock records managed separately for each valuation type
Inventory: Material Movements

Configuration (movement type) in SAP that controls:

- Account determination of transactions (Key control)
- How value changes are calculated
- How quantity changes are calculated
- How transacted (inside other transaction or stand-alone)
- Transaction: OMJJ, Table: T156

SAP transactions

- Often imbedded in other transactions / activities
  - Goods receipt (e.g. Production reporting)
  - Goods Issue (e.g. PGI in delivery processing)
  - Transfers
An Auditor With An Attitude of Professional Skepticism or
This Guy Has CPA Written All Over Him!

Well, it's inventory time again - you do the rocks and I'll do the sticks.
Inventory Control: Common Risks

• Theft
• Lost Inventory / Damage
• Transaction Errors
  – Human Errors
  – System caused (e.g. BOM accuracy)
• Material Life Cycle (e.g. obsolete / scrapping) and Shelf Life
• Segregation of Duties (physical custodians vs. accounting record custodians)
Inventory Control: Common Controls

- Segregation of Duties (physical vs. record custodian)
- Inventory policies (Written, taught, monitored)
- Test inventory transactions (shipping, production, procurement, transfers, etc.)
- Inventory Record Accuracy: physical or cycle count
- Timing
- Match control / methods to size of risk (high value)
Reading Assignment Questions / Comments:

- **FI/CO is the core of the SAP system.** Blindly engaging in other modules, like MM, SD, PP, without having a full grasp of FI/CO will directly impact the understanding of SAP system together.

- Valuation process: I would like to see how it works, what an average moving price is, and how to control it within SAP. (MM03, MR51)

- What’s the difference between cost accounting and financial accounting?

- FI controls external appearance, CO controls internal needs. Which one should be satisfied first?

  • Could you please explain the concept of non-value stock more in class?
Reading Assignment Questions / Comments:

- What is the impact of the inventory valuation on the general ledger inventory accounts?

- How often would you do a physical check on your warehouse stock before completely relying on the material masters list?

- Can there be too many controls in place that makes it unproductive?

- Does SAP keep a backup within the software of the Master data?
Inventory Control: Overview

• Inventory Types
• Inventory Counting Methods
  – Physical
  – Cycle Counting
• Inventory Value
  – How Controlled
• Material Movements
  – How Controlled

• Risks / Controls
Break Time
• Primary learning objectives are:
  – Experience concepts of beginning financial accounting
  – Review the accounting cycle
  – Work with a manual accounting information system
  – Experience how an ERP system handles the steps of the accounting cycle
Exercise 3: Journal Entries

• Agenda
  – Last Class (*March 9*): Steps 1 – 3 (Manual steps)
  – This Class (*March 16*): Step 4 (SAP steps)
  – *Due March 19 11:59 PM*: Assignment Submission
Exercise 3: Journal Entries

Step 4: Use SAP ERP system to make all above entries using the general ledger system in SAP.
(Instructions for using the SAP ERP system start on page 13 of this document)

a) Accounting ➔ Financial Accounting ➔ General Ledger ➔ Information System ➔ General Ledger reports ➔ Master Data ➔ Chart of Accounts ➔ Chart of Accounts 
(S_ALR_87012326) Examine the GLXX chart of accounts (XX is your assigned SAP student login ID#.)

b) Accounting ➔ Financial Accounting ➔ General Ledger ➔ Posting ➔ Enter G/L Account Document (FB50) Record beginning account balances in the SAP general ledger. Enter as one composite journal entry (first journal entry). Use journal entry date of January 1. Be sure to compare to Excel spreadsheet to make sure the entries are correct.
Exercise 3: Journal Entries

**Step 4:** Using SAP general ledger system

c) **Accounting ➔ Financial Accounting ➔ General Ledger ➔ Posting ➔ Enter G/L Account Document (FB50)** Record the daily transactions for January in the SAP general ledger

- Do each journal entry as a separate entry, not as one giant composite entry,
- Use appropriate dates – this allows for a good audit trail.
Exercise 3: Journal Entries

Step 4: Using SAP general ledger system

d) Display the trial balance. Compare this to your manual entries. If the trial balance does not match your manual entries, research the errors and make necessary corrections.

Options for viewing the journal entries:


– **Source Document Drill Down:** Accounting → Financial Accounting → General Ledger → Account → Display/Change Line Items (FBL3N)

Exercise 3: Journal Entries

Step 4: Using SAP general ledger system

e) Accounting ➔ Financial Accounting ➔ General Ledger ➔ 
   Posting ➔ Enter G/L Account Document (FB50) Record the 
   adjusting entries.

f) Accounting ➔ Financial Accounting ➔ General Ledger ➔ 
   Periodic Processing ➔ Closing ➔ Carry Forward ➔ 
   Balance Carryforward (New) (FAGLGVTR) Simulate closing 
   the books as of January 31 using the SAP utility.

- Do not enter closing entries into the general ledger. These entries 
  would be done automatically through the SAP month-end closing 
  function.
Extra Slides
Exercise 3: Journal Entries

- **Step 1:** Record the daily transactions
  - Record if appropriate, (some events may not involve journal entries)
  - Record into Excel
  - Review the post these journal entries into t-accounts (Excel automation) and the calculated account balances using cell formulas in Excel.
  - Review t-account balance flow into your Excel worksheet as a trial balance. Assure validity of links within spreadsheet that expedites the process and minimize risk of an error in data entry
Exercise 3: Journal Entries

• **Step 2:** Record the adjusting entry transactions
  – Record if appropriate, (some events may not involve journal entries) into Excel
  – Review the post these journal entries into t-accounts (Excel automation) and the calculated account balances using cell formulas in Excel.
  – Review t-account balance flow into your Excel worksheet as a trial balance. Assure validity of links within spreadsheet that expedites the process and minimize risk of an error in data entry
Exercise 3: Journal Entries

• **Step 3:** Review closing entries
  – Review closing entries in your trial balance as if this were a year-end close. (Do not enter the closing entries in your t-accounts.)