ASP4134 - Audit Sistem Informasi

week 10: Pengendalian Umum dan Pengendalian Aplikasi

AGENDA

1. Foundation of IT Controls
2. Impacts of IT Controls to Business Process
3. Auditing ITGC and AppCon
4. Group discussion
5. Individual assignment

ASP4134 - Audit Sistem Informasi

Key objectives:

1. memahami kerangka **konsep audit tata kelola** teknologi informasi berdasarkan standar tata Kelola
2. menyusun **program audit tata kelola** sistem informasi
3. menyusun **laporan audit tata kelola** sistem informasi
4. melaksanakan **pengauditan atas pengoperasian dan pemeliharaan** atas sistem informasi
5. melakukan **audit atas perolehan, pengembangan, dan implementasi sistem informasi**
6. melakukan **pengauditan atas keamanan informasi**
7. menggunakan **Teknik Audit Berbantuan Komputer** dalam pengujian pengendalian dan pengujian substantif
8. menjelaskan dampak kelemahan **pengendalian umum dan pengendalian aplikasi** terhadap peluang terjadinya kecurangan dan kesalahan saji pada laporan keuangan

Here we are

Today's Class

Learning Objectives (Sub-CPMK 7)

Students must be able to:

- Explain ITGC and application control
- Assess reliability of application controls
- Explain impact of control weaknesses
- Link system weaknesses to financial statement risk

Foundation of IT Controls

How Today’s Topics Connect With Last Week's

Business Transaction
↓
System Processing
↓
Data Stored
↓
Data Extracted
↓
Data Analyzed (CAATs)
↓
Audit Conclusion

What we will learn today

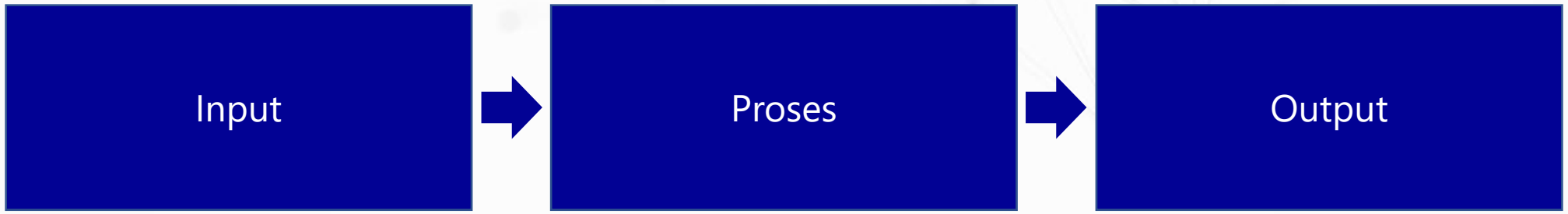
What we have started learning last week

Why Systems Need Controls

Last week we learned how to analyze data.
Today we learn why data becomes wrong.

Data analysis finds anomalies	Controls prevent anomalies	Weak control → unreliable data → unreliable audit conclusion

In accounting application, the impacts:

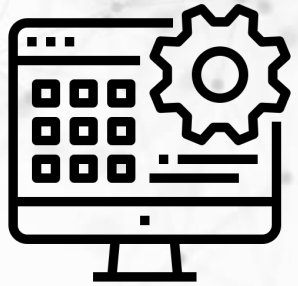


When Data Looks Correct but Is Wrong

Example:

An auditor analyzes receivable aging:

- system shows most receivables under 30 days.
- conclusion: collection is healthy.



Later discovered:

- imported dates interpreted as MM/DD instead of DD/MM.
- aging calculation completely wrong.

Was the analysis wrong, or was the data wrong?

Same Data, Different Perspective

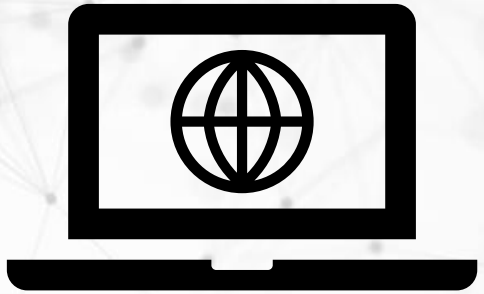
Accountant Perspective	Auditor Perspective
Is the number correct?	Can the data be trusted?
Focus on result	Focus on process
Uses reports	Questions source
Assumes system works	Verifies system logic

Accountants use data. Auditors validate data.

There is No Perfect System

In real audit work, we rarely find perfect systems.

What we usually find are:
- controls that exist but do not work,
- controls that are bypassed,
- or controls that were never properly designed in the first place.



And when this happens, the impact is not only technical.

It can lead to:
- incorrect financial reporting,
- wrong management decisions,
- and sometimes fraud that remains undetected for years.

Why Do Controls Exist?

Why do organizations need controls?

Most people say: to prevent errors and fraud.

That is correct but incomplete.

Controls exist because humans make mistakes.

And systems amplified the mistakes

If a company has a very advanced system, does it automatically mean the company is safe?

- What can still go wrong?
- Can technology eliminate human risk?

IT Controls

Control in IT Environment

IT General Control (ITGC)

- Controls that apply to all systems, components, processes, and data for a given organization or information technology (IT) environment
- If general controls are weak, even strong application controls cannot be trusted.
- Examples: Change management (program updates), IT operations (backups), and data center security

Application Control

- Controls that are specific and embedded within individual applications to ensure accuracy, authorization, & integrity.
- Application controls ensure the accuracy, completeness, and validity of data processing in a certain application.
- Examples: Input validation (checking data format), Authorized approval workflows, Processing checks (e.g., total balancing), & Output controls.

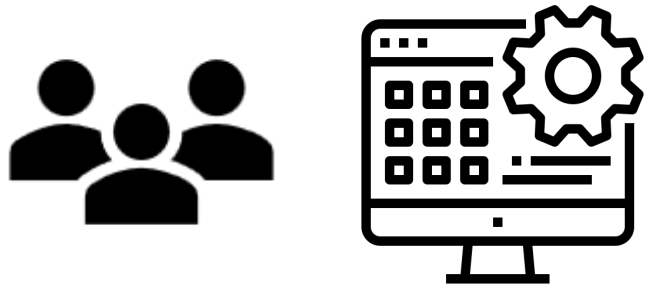
Analogy

- General controls are the foundation of a house.
- Application controls are the doors and locks.
- If the foundation is weak, strong locks will not save the house.

If general controls are weak, even strong application controls cannot be trusted ….

A system with excellent validation controls:

- Users could not enter negative numbers.
- Transactions required approval.
- Posting rules were strict.



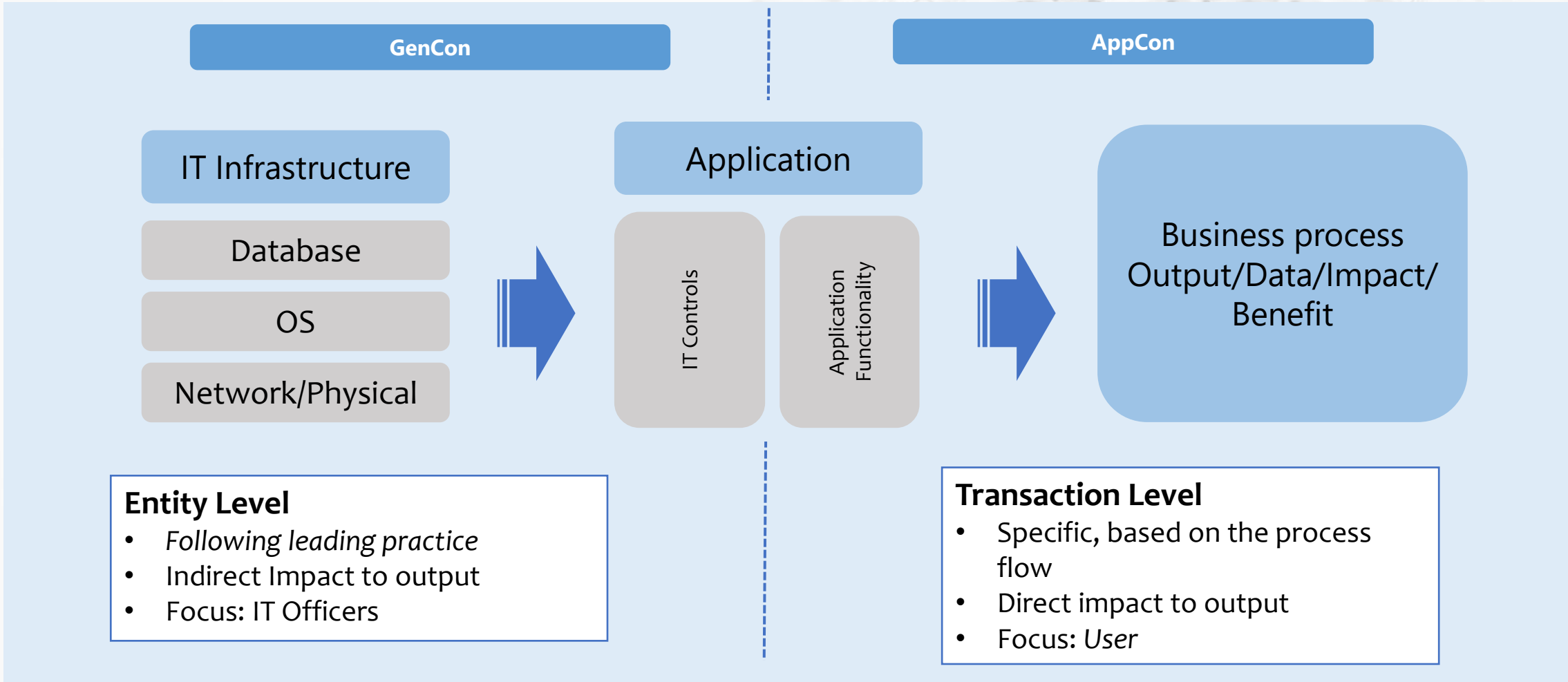
But developers had direct access to production data.

They could change data directly in the database.

At that moment, all application controls became meaningless.

This is why auditors usually start from general controls.

GenCon and AppCon



Examples of ITGC

A. Access Control
- Logical access
- Segregation of duties
- Privileged access

B. Change Management
- Program changes
- Emergency fixes
- Lack of testing

C. IT Operations
- Job scheduling
- Monitoring
- Batch processing

D. Backup & Recovery
- Data availability
- Disaster recovery

Application Control

Based on Human Interaction

Manual

control activities for applications carried out by humans so that they are not automated.

Semi Manual

control activities that combine manual and IT activities.

Otomated

control activities that are programmed and embedded to the application or that are based on configuration settings, so that they are automated in nature.

Based on the Process Stage

Input

controls to ensure that data entered into the application is authorized, accurate, and complete

Process

controls to prevent and detect errors when transaction data is processed or after transaction data is entered into the application.

Output

controls to ensure that data is processed correctly and accurately, and that information generated from the application is distributed only to authorized users and in a timely manner.

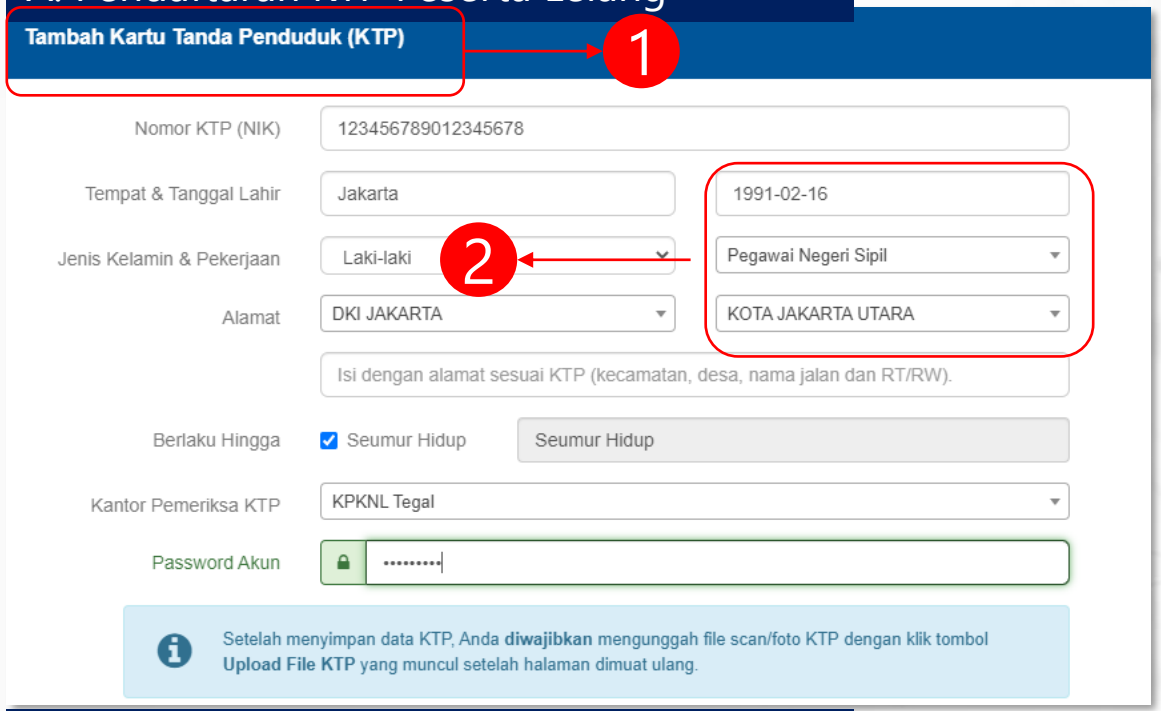
Types of AppCon

Application Control Type	Input Controls	Processing Controls	Output Controls
Manual Controls	Verification of completeness and validity of source documents prior to data entry into the application	Not applicable / processing performed outside the system	Monitoring and supervision over report generation, printing, and distribution processes
Semi-Manual Controls	Data entered by users with system validation checks (e.g., mandatory fields, format validation, approval before submission)	Processing performed automatically by the system but initiated or reviewed by users	Reports generated by the system but reviewed, validated, or approved manually before use or distribution
Automated Controls	System-enforced access and input validation based on predefined rules and user authorization	Fully automated system processing based on configured logic (e.g., automatic tax calculation)	System-restricted report access and automated report generation based on user roles and authorization levels

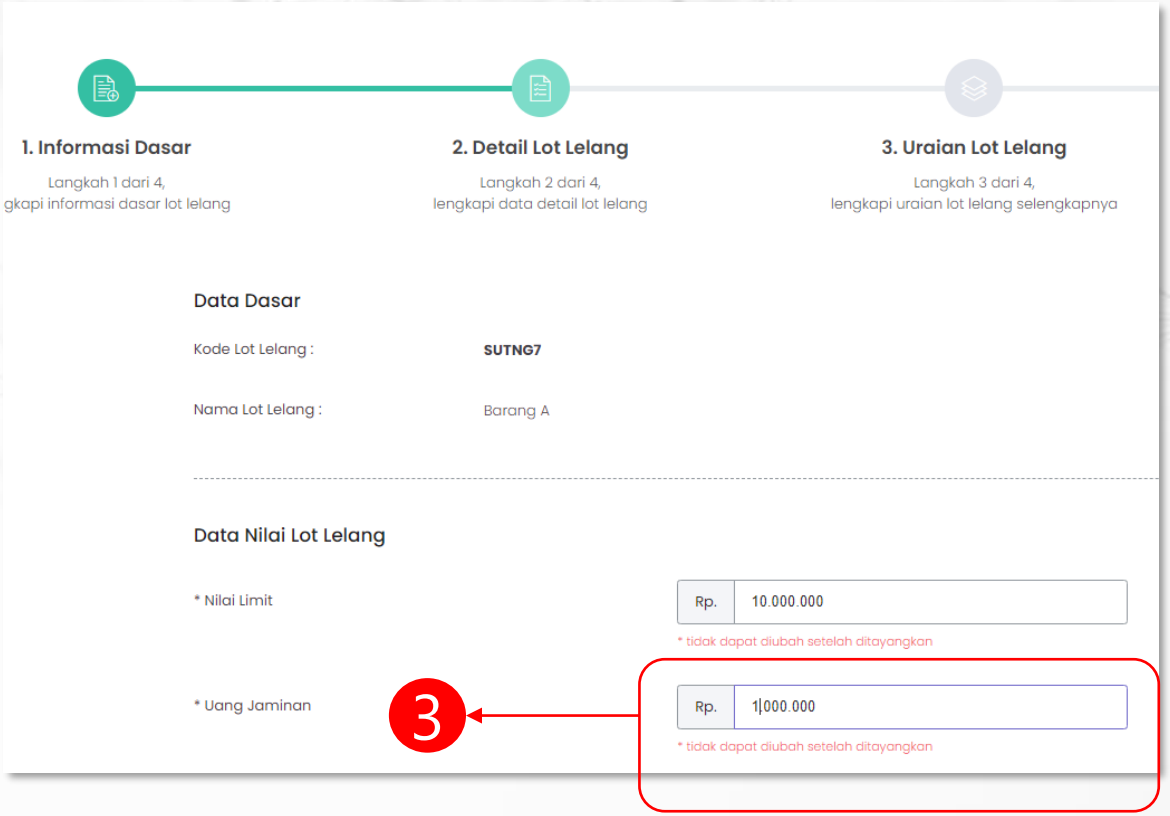
AppCon Illustration

1. Reference Table Lookup
2. Dropdown
3. Limit
4. Sequence Numbering

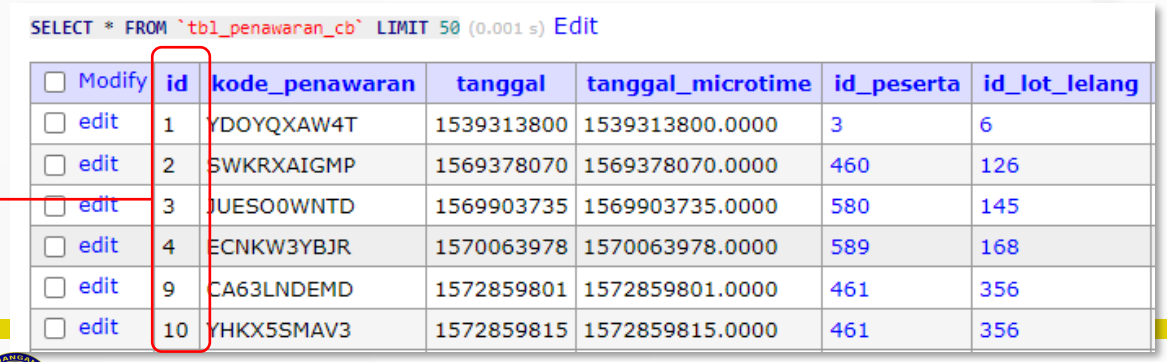
A. Pendaftaran KTP Peserta Lelang



B. Pembuatan Lot Lelang



C. Perekaman Penawaran Lelang



```
SELECT * FROM `tbl_penawaran_cb` LIMIT 50 (0.001 s) Edit
```

Modify	id	kode_penawaran	tanggal	tanggal_microtime	id_peserta	id_lot_lelang
edit	1	YDOYQXAW4T	1539313800	1539313800.0000	3	6
edit	2	SWKRXAIGMP	1569378070	1569378070.0000	460	126
edit	3	JUESO0WNTD	1569903735	1569903735.0000	580	145
edit	4	ECNKW3YBJR	1570063978	1570063978.0000	589	168
edit	9	CA63LNDEMD	1572859801	1572859801.0000	461	356
edit	10	YHKX5SMAV3	1572859815	1572859815.0000	461	356

4

Contoh Pengendalian Input

Field Interrogation

- Check Digit
- Missing Data Check
- Numeric-Alphabet Check
- Limit Check
- Range Check
- Validity Check

Record Interrogation

- Reasonableness Check
- Sign Check
- Sequence Check

File Interrogation

- Internal and external label check
- Version check

Referensi: IT Auditing, James A. Hall

Field Interrogation

Check digit	menguji kesalahan posisi angka pada suatu nilai tertentu
Missing data check	mencari data yang tidak lengkap
Numeric-alphabetic check	data berupa text tidak dapat direkam ke dalam sel yang seharusnya berisi data numerik
Limit check	menguji data yang melampaui nilai batas tertentu
Range check	menguji apakah nilainya berada di luar range yang telah ditetapkan
Validity check	menguji apakah data sesuai yang terekam sesuai dengan nilai referensi yang sudah ditetapkan

Record Interrogation

Reasonableness	data tidak dapat direkam jika tidak lolos uji kewajaran tertentu, misalnya: data registrasi mahasiswa tidak dapat terekam jika tahun lulus SLTA mendahului tahun lulus SD
Sign check	data tertentu tidak dapat direkam jika nilainya minus
Sequence check	menguji urutan record

File Interrogation

Internal and external label checks	menguji apakah file yang sedang diproses adalah yang sebenarnya diminta oleh program
Version check	menguji apakah versi file yang sedang diproses adalah yang benar

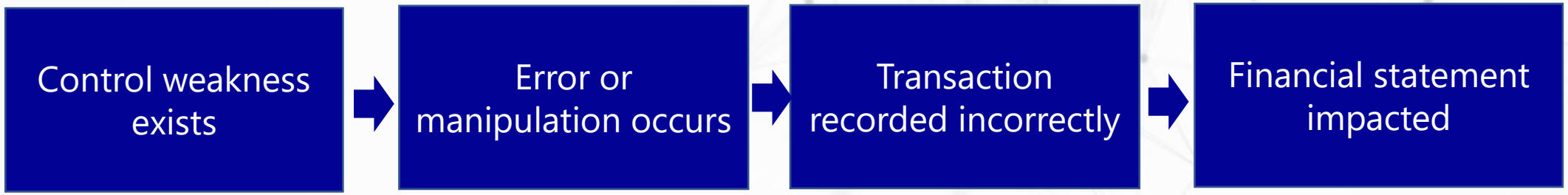
Impacts of IT Controls to Business Process

From Control Weakness to Financial Impact

An auditor does not stop at saying ‘the control is weak.’

The next question from our client could be:
“So what?”

Explain the chain:



Tip: Explain the business impact(s).

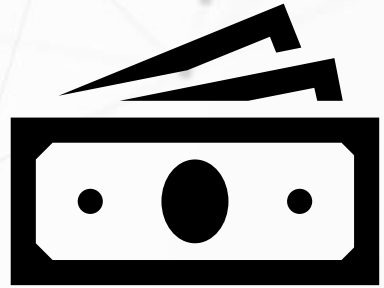
Example: Sales Cycle

Sales Order → Delivery → Invoice → Payment

Imagine sales recorded before goods are delivered.

- Revenue increases.
- Profit looks higher.
- Management believes performance improved.

But in reality, the transaction **has not happened yet.**



If revenue is overstated, who is affected?

Mini Game: “Is This Dangerous?”

Scenarios:

- Users can edit invoices after posting.
- Admin passwords are shared.
- System logs are not reviewed.

Vote, which one is:

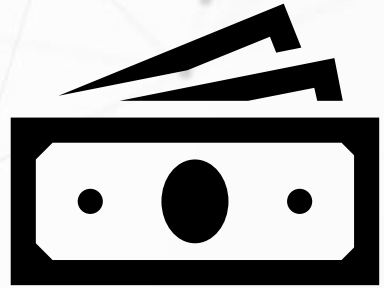
- Low risk
- Medium risk
- High risk

1. Sales, Receivables, and Cash Receipt

In this cycle, the biggest risk is revenue manipulation and cash misappropriation.

Controls:

1. Credit limit validation
2. Sequential invoice numbers
3. Matching delivery order with invoice
4. Cash reconciliation

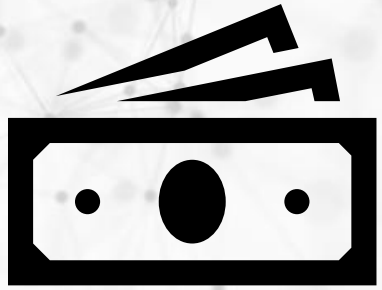


Discussion: Why is revenue one of the most commonly manipulated areas?

2. Purchasing, Payables, and Cash Disbursement

Risks:

- Fake vendors
- Duplicate payments
- Unauthorized purchases



Analogy: Household finance

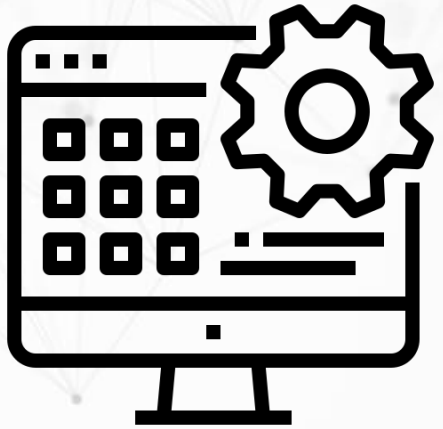
If everyone at home can transfer the household money without confirmation, what will happen? Now imagine the chaos if that happened in an organization.

Mini Game: Fraud Detection

Scenario:

A record of a new vendor is created, large payment processed immediately, approved by the same person.

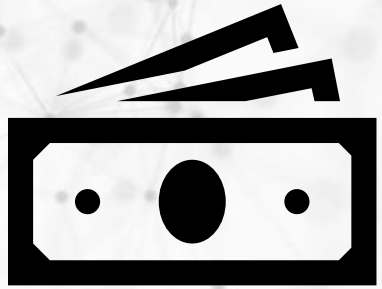
What are the red flags?



3. Inventory Module

What could happen?

- Quantity discrepancies
- Cost manipulation
- Unauthorized stock adjustments



Analogy: Inventory is like your refrigerator. If records say there are 10 eggs but only 3 exist, your next decision will be wrong. Can you serve 10 people asking for omelets?

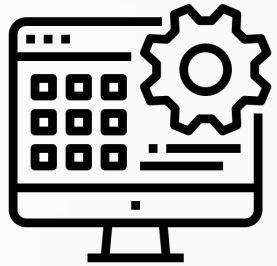
Why is inventory frequently involved in fraud cases?

4. Reporting Module

What could happen?

- Manual journal overrides
- Report parameter manipulation
- Spreadsheet dependency

- Case: Financial reports generated from system exports that were manually edited in Excel before submission. The system was correct. The report was not.



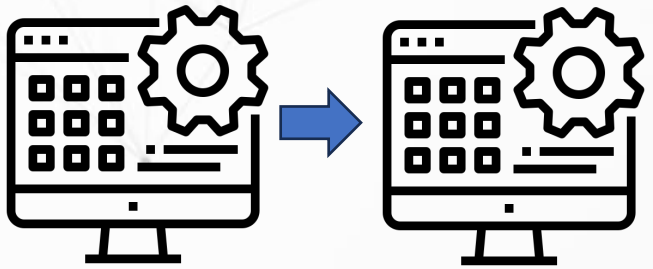
5. Import–Export Data Controls

What could happen:

- Interface validation
- Completeness checks
- Duplicate detection

Analogy: transferring data between systems is like pouring water from one glass to another. We must ask:

- Did anything spill?
- Was anything added?"



Auditing AppCon and GenCon

Audit Process

"The audit objective is to assess the **reliability (design and effectiveness)** of controls over the applications that support the business processes supported by the applications."

Audit Planning

1. Process understanding
2. ***Application Walkthrough*** , collecting information on the *user experience*
3. Development of The application's ***Risk Control Matrix*** (RCM) dan Audit Program (ToD dan ToE)

Fieldwork

4. ***Test of Control Design***
5. ***Test of Control Effectiveness***
6. Confirmation and conclusion formulation

Business Understanding and Walkthrough

Analyze the relevant documentation:

- Regulation
- Policy
- SOP

Analyze the system documentation

- *user manual*
- *System development documentation (use case*, ERD, data dictionary)

Application Simulation

Collecting user experience data (to identify system usage issues, provide more accurate recommendations for application improvements, and understand user usage practices)

Documenting *Risk and Control Matrix* (RCM)

Risk Control Matrix

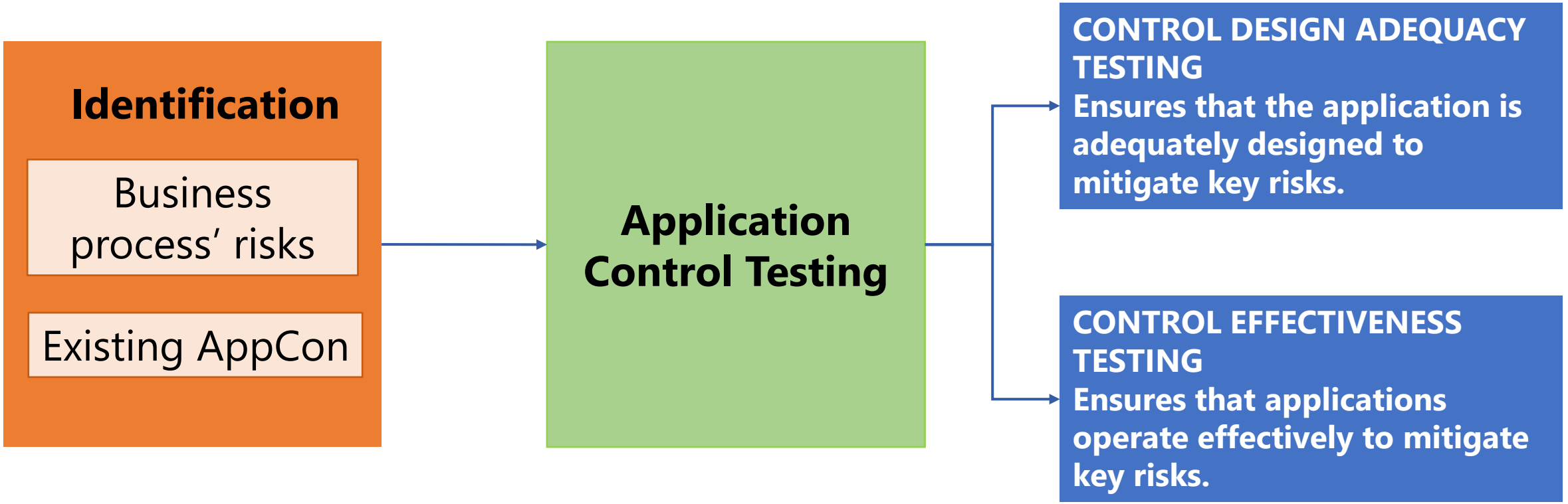
A table containing the results of the identification and assessment of risks and controls by the auditor for activities in the business processes that are the object of audit activities as a basis for determining the work steps for testing controls.

Example:

ID RISIKO	RISIKO	ID PENGENDALIAN	PENGENDALIAN	TIPE PENGENDALIAN
6.	Penawaran Lelang tidak sesuai dengan ketentuan sehingga penetapan pemenang lelang tidak akurat.	6.1	Aplikasi menolak nilai penawaran yang kurang dari nilai limit.	Aplikasi
		6.2	Aplikasi menyediakan tombol tambah/kurang sesuai kelipatan nilai penawaran (OB).	Aplikasi
		6.3	Aplikasi menolak penawaran yang kurang dari penawaran sebelumnya atas peserta yang sama (OB).	Aplikasi
		6.4	Aplikasi menolak penawaran baru yang kurang dari penawaran tertinggi (OB).	Aplikasi
		6.5	Aplikasi menolak penawaran yang dilakukan setelah tanggal ditutupnya penawaran.	Aplikasi

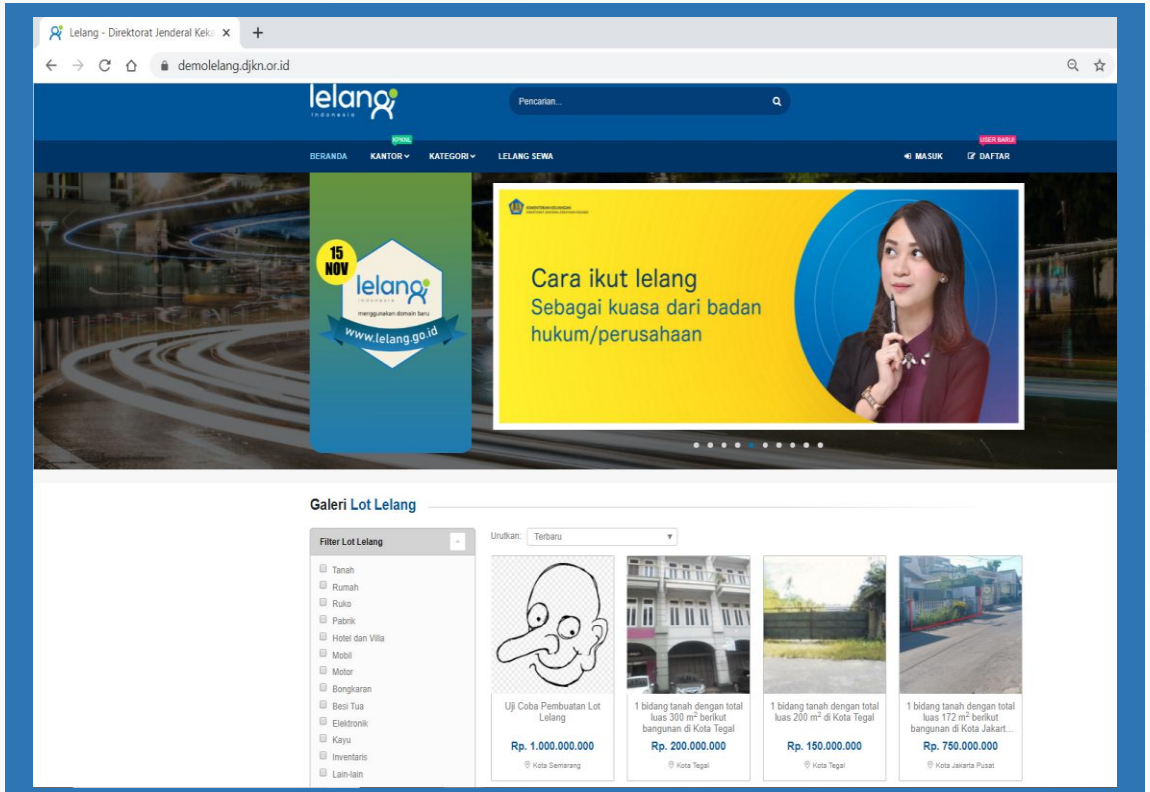
Test of Control

Control testing is conducted using a risk-based approach.



Testing of Application Control

Test of Design



Application Simulation / *Negative Test*

Test of Effectiveness

***Script* Pengujian**

```
SELECT bid.*
  , lot.kelipatan_bid
  , mod(bid.kelipatan, lot.kelipatan_bid) modulus
FROM (
SELECT ob.*
  , ob2.id_pengguna next_id_pengguna
  , ob2.id_lot_lelang next_lot
  , ob2.id id_next
  , ob2.nilai_penawaran next_penawaran
  , ob2.nilai_penawaran - ob.nilai_penawaran kelipatan
FROM
(SELECT *
FROM tbl_penawaran_ob) ob,
(SELECT *
FROM tbl_penawaran_ob) ob2
WHERE ob.id+1 = ob2.id
AND CONCAT(ob.id_pengguna, ob.id_lot_lelang) = CONCAT(ob2.id_pengguna,
ob2.id_lot_lelang) ) bid LEFT JOIN lot_lelang lot
ON bid.id_lot_lelang = lot.id
WHERE mod(bid.kelipatan, lot.kelipatan_bid) <> 0;
```

Data Analysis – CAATs (test script)

Test of Design

Objective :

Controls have been designed into the application to mitigate risks.

Method:

Simulation */negative test*

Example:

Perform a simulation to ensure that the application rejects the creation of auction lots on the same day as the auction.

Test of Effectiveness

Objective :

Controls have been effectively implemented in the application consistently.

Method:

Analysis of historical data using CAATs.

Example:

Perform historical data analysis with a test script, ensuring that no auction lots are created on the same day as the auction.

id	kode	id_unit	cara_penawara	tgl_dibuat	tgl_ditutup	tgl_batas_jamina	status
231913	4YQE9H	49	OPENBIDDING	5/15/2019 10:07	5/15/2019 12:00	5/14/2019 23:59	TAP
234104	QPMEWV	54	CLOSEDBIDDING	5/22/2019 12:17	5/22/2019 13:00	5/21/2019 23:59	TAP
234272	QZF8X2	89	CLOSEDBIDDING	5/23/2019 7:46	5/23/2019 9:00	5/22/2019 23:59	TAP
234276	FCNAWT	89	CLOSEDBIDDING	5/23/2019 8:03	5/23/2019 9:00	5/22/2019 23:59	TAP
234280	MKX3TJ	89	CLOSEDBIDDING	5/23/2019 8:10	5/23/2019 9:00	5/22/2019 23:59	TAP
234281	FANZXJ	89	CLOSEDBIDDING	5/23/2019 8:15	5/23/2019 9:00	5/22/2019 23:59	TAP
235687	ABM256	29	CLOSEDBIDDING	6/11/2019 8:44	6/11/2019 10:00	6/10/2019 23:59	TAP
240192	FR7G5P	41	CLOSEDBIDDING	6/27/2019 8:19	6/27/2019 10:00	6/26/2019 23:59	TAP
				7/3/2019 8:38	7/3/2019 10:00	7/2/2019 23:59	TAP
				7/3/2019 8:45	7/3/2019 10:00	7/2/2019 23:59	TAP
				7/3/2019 8:50	7/3/2019 10:00	7/2/2019 23:59	TAP
				7/4/2019 8:23	7/4/2019 10:00	7/3/2019 23:59	TAP
				7/4/2019 8:26	7/4/2019 10:00	7/3/2019 23:59	TAP
				7/4/2019 8:28	7/4/2019 10:00	7/3/2019 23:59	TAP
				7/4/2019 8:30	7/4/2019 10:00	7/3/2019 23:59	TAP
				7/5/2019 7:29	7/5/2019 9:00	7/4/2019 23:59	TAP

TE 1.2.1. Lot lelang yang dibuat pada hari yang sama dengan pelaksanaan lelang.

Risiko	R1 Pembuatan Lot Lelang tidak akurat (tidak sesuai dengan permohonan dan ketentuan).
ToE	Lakukan analisis data historis, pastikan tidak terdapat lot lelang yang dibuat pada hari yang sama dengan tanggal pelaksanaan lelang.
Teknik	Membandingkan tanggal pembuatan lot lelang dengan tanggal penutupan.
Atribut Pengujian	Tgl_dibuat = tgl_ditutup Tgl_dibuat > tgl_batas_jaminan

***Script* Pengujian**

```
SELECT *
FROM lot_lelang
WHERE DATE_FORMAT(tgl_dibuat, '%Y-%m-%d') >= DATE_FORMAT(tgl_ditutup, '%Y-%m-%d');

SELECT *
FROM lot_lelang
WHERE DATE_FORMAT(tgl_dibuat, '%Y-%m-%d') >
DATE_FORMAT(tgl_batas_jaminan, '%Y-%m-%d');
```

ITGC Audits

Tests of general controls in an application audit typically cover:

- Database server
- Application server
- Database configuration
- Web application security

Test of Design

Analysis of policies and rules related to server and database configuration > For organizations that have designed adequate configuration controls.

Test of Effectiveness

Configuration Analysis: Penetration Testing Script

```
set echo on
REM ********************************************************************************
REM Inspektorat Jenderal Kementerian Keuangan_Audit Oracle DB Script
REM CIS - Oracle Database 11g R2 Benchmark (v2.0.0-02-27-2015)
REM Modified by Septa, Anggata, & Agung --dw
REM ********************************************************************************

set echo off
set termout on
set heading on
set feedback off
set trimspool on
set linesize 200
set pagesize 200
set markup html on spool on

Spool pdeinternet_dbkonfig.html

prompt [Control]: 1.2.Ensure All Default Passwords Are Changed
prompt [Query] : SELECT USERNAME FROM DBA_USERS_WITH_DEFPWD WHERE USERNAME NOT LIKE '%XS$NULL%';
SELECT *
FROM DBA_USERS_WITH_DEFPWD
WHERE USERNAME NOT LIKE '%XS$NULL%';

prompt [Control]: 1.2.Default Passwords
prompt [Query] : SELECT USERNAME, PASSWORD FROM DBA_USERS WHERE PASSWORD IN ();
SELECT A.USERNAME
    , A.DEFAULT_TABLESPACE
    , B.PASSWORD
FROM DBA_USERS A, (
SELECT --USERNAME
    NAME --DW
    , PASSWORD
--FROM DBA_USERS
FROM USER$ --DW
WHERE PASSWORD IN
```

After Today, You Should Think Differently

Before:

- System output = fact
- Data = evidence

After:

- System output = claim
- Data must be validated
- Auditor questions process, not only result

Simulasi ToE AppCon

Data Validation

Pengujian Pengendalian Aplikasi

1 Check Digit

Contoh penerapan Check Digit:

- Pemberian nomor International Standar Book Number (ISBN) ditetapkakn dengan 10 digit atau 13 digit
- Pada ISBN 13 digit, Digit ke-13 adalah Check Digit

ISBN-13: 978-0-306-40615-?

Formula Check Digit ISBN:

i. a*1 + b*3 + c*1 + d*3 + ... + l*3 = X
ii. X modulus 10 = Y
iii. Jika Y = 0 maka check digit = 0
iv. Jika Y <> 0 maka check digit = 10 - Y

Formula Check Digit ISBN:

i. 9*1 + 7*3 + 8*1 + 0*3 + ... + 5*3 = 93
ii. 93 modulus 10 = 3
iii. ~~Y = 0 maka check digit = 0~~
iv. Y <> 0 maka check digit = 10 – 3 = 7

ISBN-13: 978-8-306-40615-7

Pengujian

Lakukan rekalkulasi menggunakan formula excel lalu cocokkan

=LEFT() =MID() =RIGHT() =IF()

Pengujian Pengendalian Aplikasi

2 Missing Data

Pengendalian ini ditujukkan agar tidak ada data yang kosong ketika diproses/disimpan

Contoh:

- Nomor Invoice tidak boleh kosong pada setiap transaksi.

Pengujian

Lakukan pengujian apakah ada data yang kosong

=COUNT() =COUNTA() =COUNTBLANK()

Pengujian Pengendalian Aplikasi

3 Numeric-alphabetic

Pengendalian ini ditujukkan untuk memastikan format data diproses/disimpan sesuai dengan semestinya

Pengujian

Lakukan pengujian apakah data yang diimpor sesuai dengan formatnya

=ISNUMBER() =ISTEXT() =ISNONTEXT()

Untuk menguji kolom numeric dapat juga dilakukan dengan melakukan operasi matematika pada salah satu sel pada kolom tersebut. Bila terjadi error berarti format kolom bukan merupakan numeric dan perlu penanganan lebih lanjut

Pengujian Pengendalian Aplikasi

4 Limit Check

Pengendalian ini ditujukkan untuk memastikan bahwa data yang di-input tidak kurang dari batas minimal atau tidak melebihi batas maksimal

Contoh:

- Setiap transaksi yang dilakukan oleh staf penjualan maksimal bernilai Rp20.000.000

Pengujian

Lakukan pengujian apakah data telah sesuai dengan limitnya

=IF() < > <= >= FILTER/ADVANCED FILTER

Pengujian Pengendalian Aplikasi

5 Range Check

Pengendalian ini ditujukkan untuk memastikan bahwa data yang di-input tidak kurang dari batas minimal dan tidak melebihi batas maksimal

Contoh:

- Batas usia pendaftar ujian saringan masuk STAN adalah 17 (minimal) dan 21 tahun (maksimal)

Pengujian

Lakukan pengujian apakah data yang diimpor sesuai dengan range-nya

=IF =AND < > <= >= FILTER/ADVANCED FILTER

Pengujian Pengendalian Aplikasi

6 Validity Check

Pengendalian ini ditujukkan untuk memastikan bahwa data yang di-input/proses/simpan sesuai dengan referensi yang sudah ditetapkan

Contoh:
- Transaksi dilakukan oleh pegawai yang terdaftar dalam daftar pegawai
- Kode akun yang diinput sesuai dengan Chart of Account perusahaan

Pengujian

Lakukan pengujian apakah data yang diimpor sesuai dengan range-nya

=IF =AND < > <= >=

Pengujian Pengendalian Aplikasi

Reasonableness

Menguji kewajaran isi suatu data

Contoh:
- Tanggal pengiriman barang seharusnya tidak mendahului tanggal pemesanan
- TMT CPNS pada NIP seharusnya tidak mendahului tanggal lahir

Pengujian

Lakukan pengujian terbalik atas logika kewajaran data

=IF =AND < > <= >= dll

Pengujian Pengendalian Aplikasi

8 Sign check

Menguji apakah suatu kolom hanya bernilai positif atau negative saja atau dapat bernilai positif/negatif

Contoh:
- Nilai transaksi harusnya tidak dapat bernilai minus

Pengujian

Lakukan pengujian sesuai kriteria kolom

=IF < > <= >= dll

Pengujian Pengendalian Aplikasi

9 Sequence

Menguji urutan record dalam hal menjaga kelengkapan data

Contoh:

- Nomor invoice dibuat beruturan untuk mencegah adanya invoice yang tidak tercatat atau invoice yang nomornya tidak valid

Pengujian

Bandingkan jumlah record data dan selisih antara sequence pertama dan terakhir, atau
Buat nomor urut control dan bandingkan urutannya dengan urutan kolom yang diuji

=COUNT =COUNTA =COUNTIF =RIGHT =LEFT =MID =IF

Pengujian Akurasi Data

Menghitung ulang apakah kalkulasi-kalkulasi pada data telah sesuai dengan perhitungan matematis

Contoh:
- Menghitung ulang tarif pajak
- Menghitung ulang diskon
- Menghitung ulang penjualan bersih

Pengujian

Pahami kriteria penghitungan pada suatu kolom, lakukan perhitungan ulang, bandingkan hasilnya

=SUM =SUBTOTAL * / + - dll

Pengujian Konsistensi Data

Tingkat konsistensi data, dalam kumpulan data yang sama atau di beberapa kumpulan data

Contoh:

- Pada kolom Gender seharusnya berisi Pria atau Wanita. Namun data menjadi tidak konsisten ketik terdapat record yang berisi Laki-Laki atau Perempuan

Pengujian

Pahami kriteria data yang konsisten, lakukan pengujian apakah ada data yang diluar konsistensi

Pivot Table Filter IF

Pengujian Duplikasi Data

Atas satu transaksi/record terdapat dua atau lebih data yang sama karena di-input/simpan lebih dari satu kali.

Contoh:
- Terdapat lebih dari satu record atas penjualan dengan nomor invoice yang sama
- Pada tabel gaji bulanan, nama/no pegawai tertentu muncul dua kali

Pengujian

Pahami kolom mana yang tidak dapat memiliki nilai duplikat, uji duplikasi

=COUNTIF() Pivot Table Filter IF CONCATENATE &

Pengujian Keseragaman Data

Sejauh mana data ditentukan menggunakan satuan ukuran yang sama

Contoh:

- Pada kolom unit barang menggunakan satuan berat yang sama (missal kg)
- Pada kolom nilai pastikan menggunakan mata uang rupiah di seluruh transaksi

Thank You

ASSIGNMENT – Aplikasi Keuangan Pribadi

1. Membuat Excel Aplikasi Keuangan Pribadi dengan fungsionalitas paling sedikit:

- Input transaksi paling sedikit:
  - Tanggal Jenis (Income / Expense)
  - Kategori (Makan, Transport, Hiburan, dll)
  - Jumlah
  - Sumber Aset
- Laporan sederhana secara otomatis:
  - Laporan Aset
  - Laporan Pendapatan/Pengeluaran

2. Desain pengendalian aplikasi pada Excel.

- Minimal memuat: Input control, Processing control, dsb

3. Isikan contoh data minimal 100 record

Output:

- **File Excel.xlsx**
- **1 halaman: Desain Pengendalian Aplikasi**