

# ملخص كامل CMA Part 1 لمنهج

مصدر المحتوى

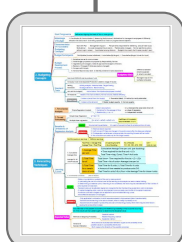
الملف معمول mindmaps  
على شكل خرائط ذهنية  
عملقة

23 Pages  
- size A3

الملف يحتوي تقريبا على  
كل  
\* التعريفات  
\* القوانين / المعادلات  
\* الكلمات الأساسية  
\* المقارنات  
\* وأكثر

90%

10%



أتمنى تطبعه ملون A3  
مقاس ومتسترخصش

لو طبعته على ورق A4

معلش حتتكلف شويه

يبقى بتضيع وقتك

اعداد الطالب / أسس المغربي

لخصته بنفسى  
ومكتوب على الكيبورد Typing  
اعتمادا على المذاكرة والكلمات  
الأساسية فى المنهج  
أتمنى انه ميكونش فيه انتهاك  
حقوق ملكية لأحد

بعض الجداول من صفحة  
وفيديوهات أستاذنا الغالى طارق  
نعيم  
وأتمنى انه يكون موافق على نشر  
الملف على صفحته عشان يستفيد  
الكل وتعم الفائدة للجميع

Cash & Cash equivalents

Short term (3 months or less from first Acquired) / Highly liquid (cash/checking/saving accounts)

Not Cash (Certificate of deposits CDs) / Money market funds / Legally restricted deposits )

Valuing A/R

Gross method / Net method

Credit losses

1- % of receivable method      2- % of sales method

Factoring A/R

Use receivable as an immediate source of cash

without recourse / with recourse

In-Transit Goods (FOB shipping point / FOB Destination)

Consigned Goods

Good out on Approval

Obsolete inventory

The T-account for that Allowance for credit losses account:

DR.	Allowance for credit losses	CR.
		XXX Beginning balance 1
XXX Amount written off as credit loss for the year 2		XXX Collection of previously written-off credit losses 3
		XXX credit loss expense (amount to be charged) 4
		XXX Ending balance 5

Inventory

Inventory recording

Inventory formulas

1. FIFO

adv: Ending Inv approximates current replacement costs

dis: Current revenues are matched with older costs

- NOT Allowed under IFRS -

2. LIFO

adv:

1. matches current costs against current revenues

2. if price rises, higher COGS lower income tax, increase in cash flow

dis:

1. in inflation (rising prices), income will show lower than other methods

2. in inflation (rising prices), lower value of inventory

In inflation Period	Cost of Goods Sold	Ending Inventory	Gross Profit (Net Income)
FIFO	Lowest	Highest	Highest
LIFO	Highest	Lowest	Lowest

3. Average Costs

1. perpetual Cost = Total cost of purchase ÷ number of purchased units

2. Periodic : Cost = (Beginning costs + Purchases) ÷ (Beginning units + Purchased units)

4. Specific identification

Inventory count

Write-Down & LCM

(Permanent Declines)

1. If using (LIFO) or (Retail Method) we select (Designated Market Value)

use (LCM)

2. If using any Other than LIFO

use LowerOf (Cost or NRV)

NRV is the estimated selling price in the ordinary course of business, (minus) reasonably predicatable costs of selling

Inventory Errors

3 Steps

1. Actual formula

2. Correct formula

3. difference (Effect)



# 1) Asset Valuation

3 Ctgrs / ways

Category	Valuation	Unrealized holding gains and losses	Other income effects
Held-to-maturity	Amortized cost	Not recognized	Interest when earned + gains and losses from sale.
Trading	Fair value	Recognized in net income (income statement)	
Available-for-sale	Fair value	Recognized as other comprehensive income OCI component of stockholders' equity	

Investments

Investment in Equity Securities

Category	Valuation	Unrealized Holding gains or Losses	Other Income effects
Holdings less than 20%			
1. Equity security that <b>does</b> have a readily determinable fair value	Fair value	Recognized in net income	Dividends declared gains and losses from sale.
2. Equity Security that <b>does not</b> have a readily determinable fair value	Cost Less Impairment		
Holdings between 20% and 50%	Equity	Not recognized	Proportionate share of investee's net income.
Holdings more than 50%	Consolidation	Not recognized	Not applicable

Initial Recording

	Purchased (External)	Internally developed
Recognition	recorded and capitalized	not recorded and not capitalized
Measurement	original cost paid + any additional costs such as legal fees and other costs of transfers	R&D are expensed and not capitalized only costs can be capitalized are legal costs

Intangible assets

Amortization

1) determined life (finite)      amortized

2) no determinable life (indefinite)      Not amortized, only tested regularly

2. Tradename/Trademarks

3. Copyrights (Ex. publisher)      Effective of life + 70 years

4. Franchises

5. Goodwill (only purchased)      Impairment      3 Steps      1. Qualitative      2. Quantitative      3. Test/Compare

Impairment

1. Definite life      same as Fixed assets (2 steps)

2. Indefinite (not including Goodwill)      3 Steps      1. Qualitative      2. Quantitative      3. Writedown

## Fixed Assets

Recording

Keywords

MACRS Tables

Tax purpose:

- Ignore Salvage value when calculating dep for Tax purpose

- use Half-year convention for the (acquisition & disposal) years

Methods

1. Straight Line      for Tax purpose, do not deduct salvage value

2. Double Line (Accelerated)

3. Sum-of-years-digits (Accelerated)

4. Units of Production

Impairment

2 Steps:

1. Recover -ability Test      Compare: Carrying amount > total undiscounted cashflows

2. Recognize impariment loss      Imp Loss = Carrying value - current fair value

Disposal

Depreciation for Tax purposes

Ex: (new technology)

Exclusive granted in US for usually 20 years

Amortized at the shorter of (Economic life), or (Legal life)

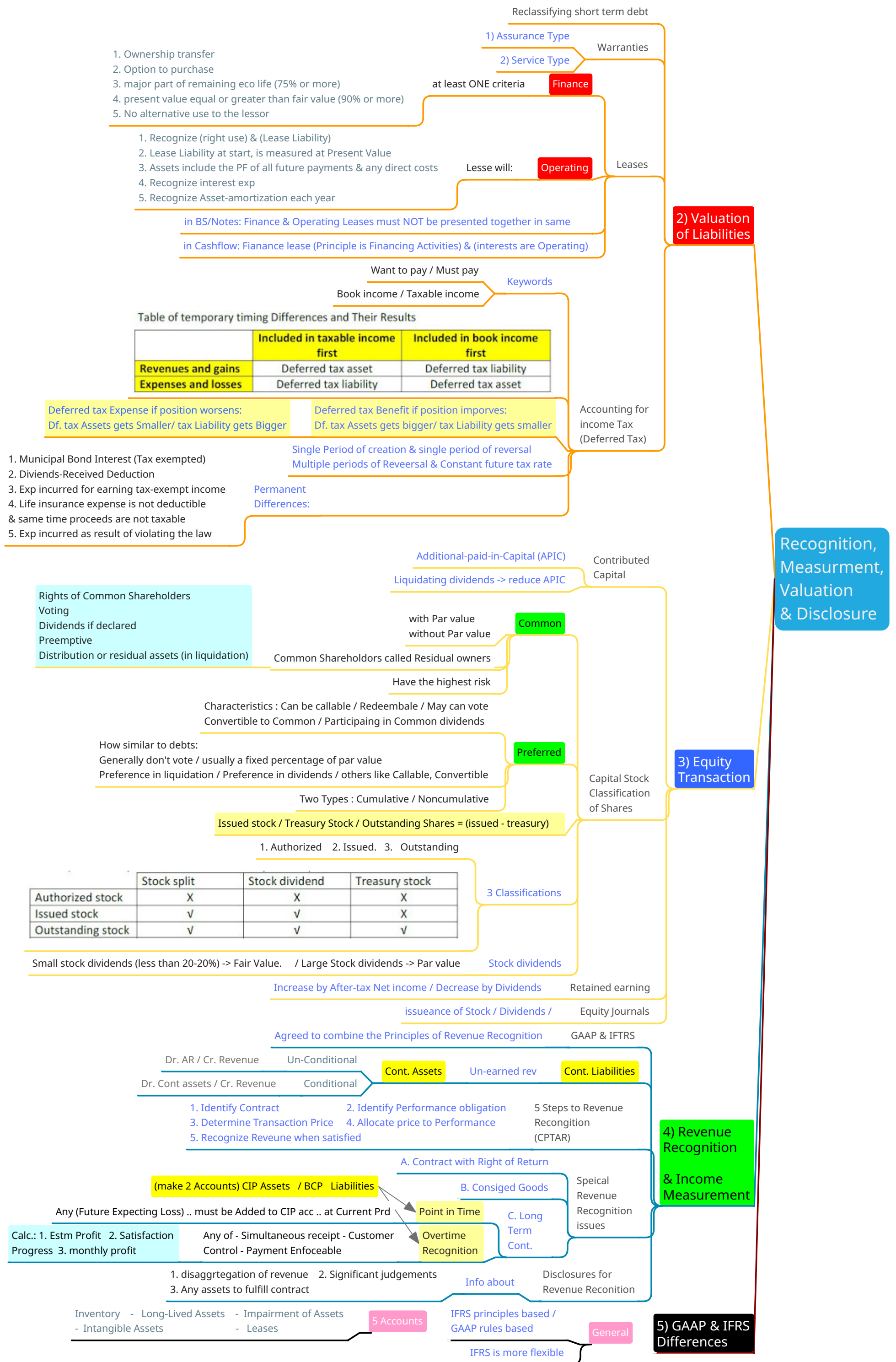
Purchased patent -> historical costs -> to be amortized

Internal generated -> only Registration & legal fees are capitalized / amortized (R&D is expensed)

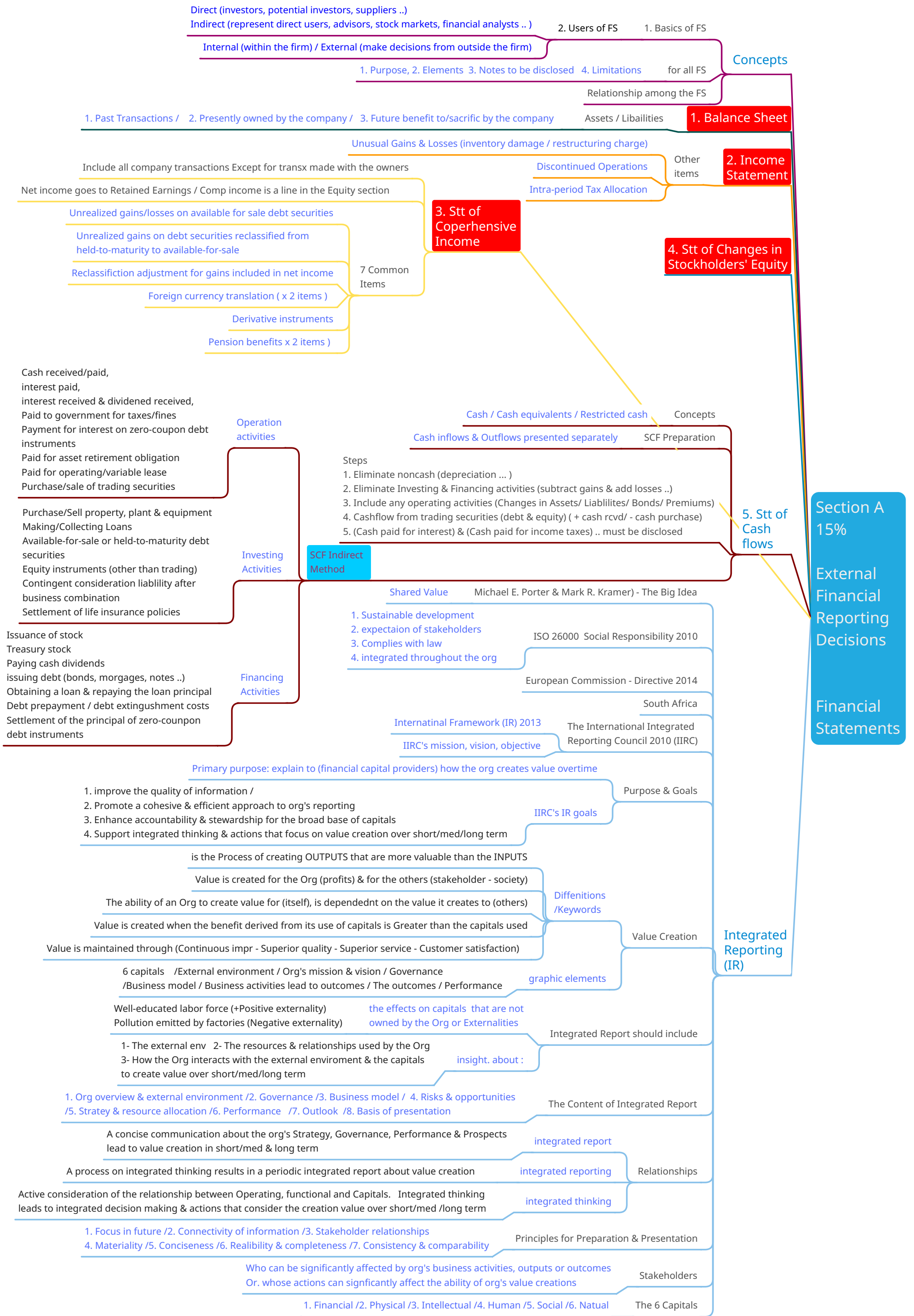
Defending patent legally

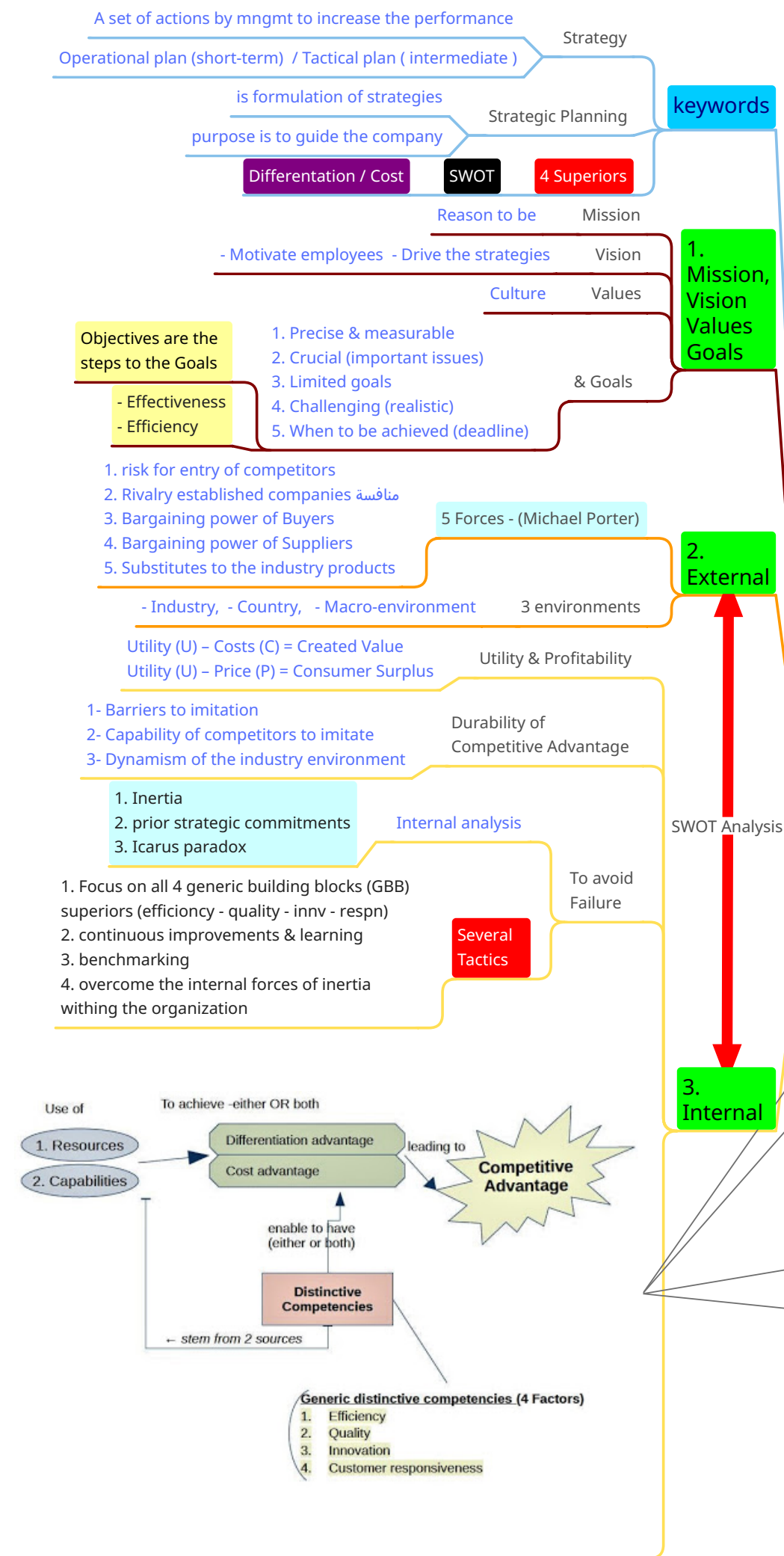
if Succeed -> costs are capitalized/amortized

if failed -> all costs should be expensed (and patent to written off)

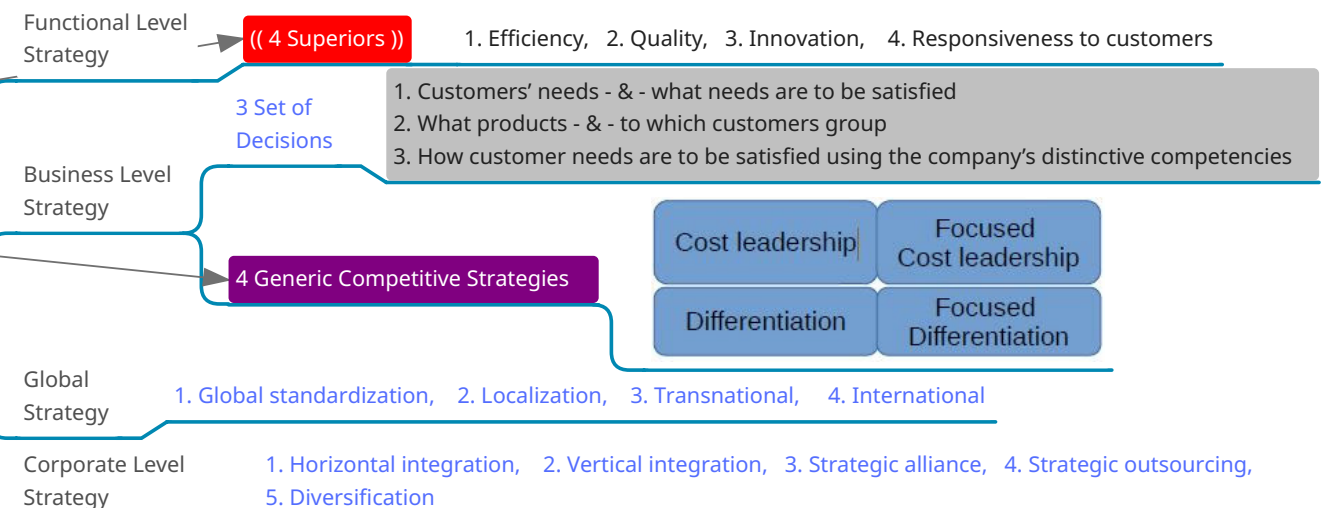
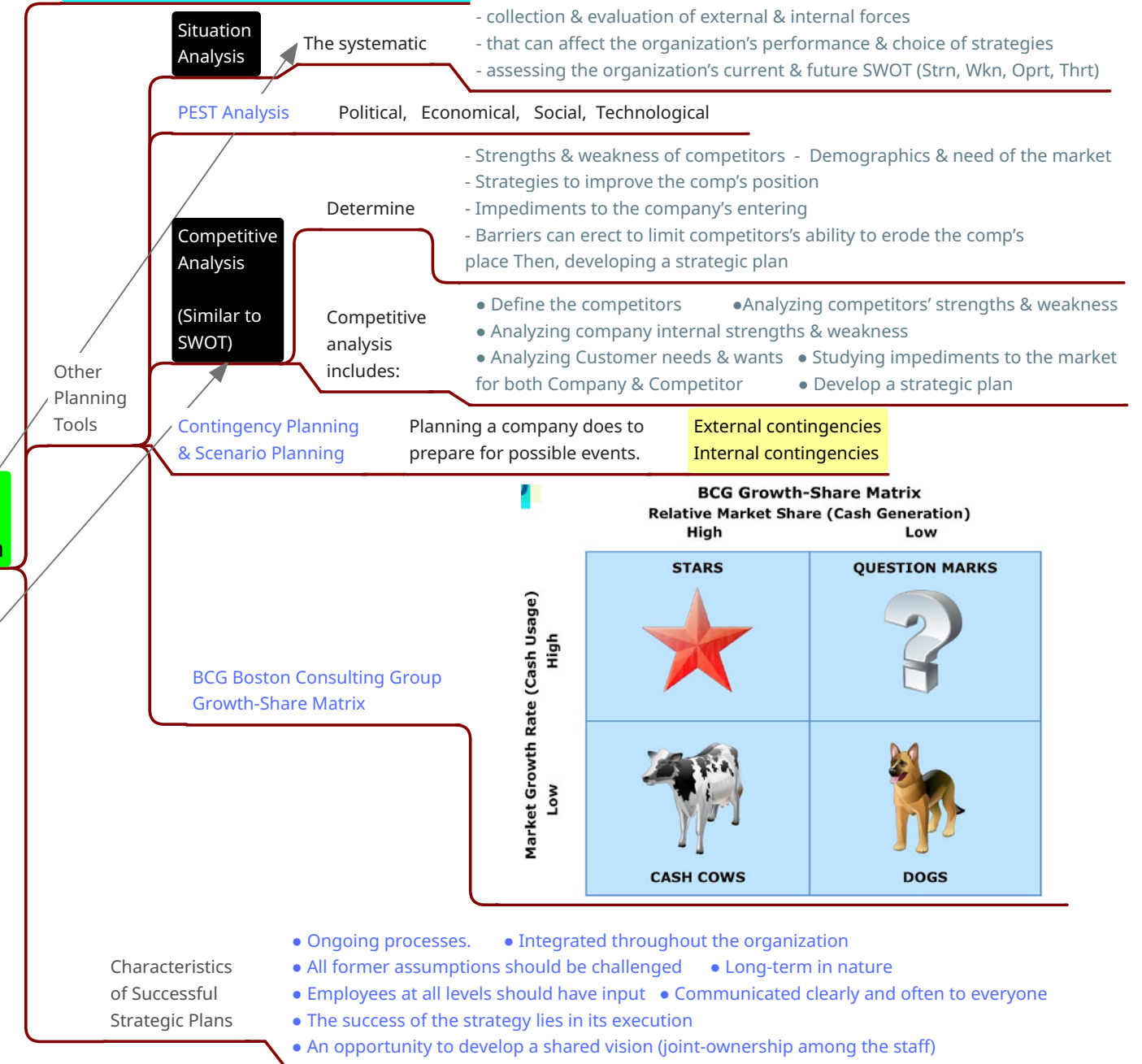








## 1. Organization Structure, 2. Control Structure, 3. Organization Culture



## Goal Congruence

Defined as: Aligning the Goals of Two or more groups

## Advantage of Budget

1. Coordination & Communication
2. Measuring Performance
3. Motivations for managers & employees
4. Efficiently allocation the resources
5. Controlling operations
6. Check on progress toward objectives

## Characteristics of / Successful Budgeting Concepts

- Start with Plan
- Management Support
- People who's responsible for delivering - (should have input)
- Motivational
- Accurate & expected future events
- Flexible (allow changes)
- Not be rigid (force actions without mgmt review)
- Coordinated among divisions
- Budget's time match the Purpose (usually 1 year)

## Budget Participants

Participative (Involve individuals) / Autoritative (By Mngmt) / Consultative (Mngmt 1st ask for input)

## Budget Development Process

1. Guidelines are set & communicated
2. Intital Budget proposals are prepared by Responsibility Centres
3. negotiate by all managers, review & approval the budget to Directors
4. Revisions / Changes (if initial assumptions changed)
5. Compare with Actuals
6. Variance Reports every level - to identify problems & make adjustments

## Budgetary Slack

Difference between (what's expected) & (what's recorded)

Managers may do it to be Easily Achievable

## 2. Budgeting Concepts

## Standard Costs

how much SHOULD cost to produce 1 unit

Company must know (expected Production Level) & ( Usage of inputs)

Setting Standards

- Activity analysis - Historical data - Target Costing
- Strategic decisions - Benchmarking

who set the budgets?

Authoritative / Participative (employees invovled)

OH Stadards

Based on Normal conditions, Normal volume, Desired efficiency

Output Level

2 relate to (what Plant Can Supply)

1. Theoretical (ideal) 2. Practical (currently attainable)

2 relate to (the demand)

1. Master budget capacity 2. Normal capacity

## 1. Time Series Analysis

Simple Regression Analysis

makes 2 assumptions

1. Variations for the passage of time
2. Relationship  $y = ax + b$

b = y-intercept (the value when time is 0)

a = slope of regression

x = independent variable

## 2. Causal forecasting

Simple linear Regression

$$y = ax + b$$

Multiple linear regression

$$\hat{y} = a_1x_1 + a_2x_2 + a_3x_3 + b$$

Coefficient of Correlation value is between -1 & +1

## Benefits & Limitations of Regression Analysis

### Benefits

Nnumerical & quantitative - It's used to forecast the fixed & variable portions of costs.

### Limitations

1. Historical data is required.
2. it will not work if there are changes in the environment after the data was collected.
3. If independent variable was not appropriate, the resulting forecast will be invalid.
4. The conclusions are valid only for the range covered.

## 3. Forecasting Techniques

## Learning Curves

50.01% (maximum learning) / 100% (no learning).

Total Time -> Average Time  
Average Time -> Total Time

LC Learning Curve %  
n No of doubling

No. of Double  
1/2 - 2/4 - 3/8 - 4/16 - 5/32

is it ?  
Units /or Lots

1. Cumulative Average-time

1. Average Time per unit

Cumulative Average Time per unit (per doubling)  
= Time required for the first unit  $\times$  LCn  
Total Time = Avg. Cumul. Time  $\times$  # of units

average for All units Produced

2. Total Time for all

Total time = Time required for first lot  $\times$  (2  $\times$  LC)n  
Total Time  $\div$  No of units = Average time per lot

3. Total Time for a certain block of units

Total Time for 8 units (-) Total Time for 4 units  
= Amount of time needed to produce units 5-8.  
That Time for units 5-8 ( $\div$ ) Four = the Average Time for those 4 units

2. Incremental unit-time (Not on Exam)

### Benefits

- Make or buy decisions (analysis of the cost to make product)
- In calculating the cost of a contract over its life, learning curve analysis can lead to better bidding.
- In determining a breakeven point, if learning is not considered, the result may be overstatement of the number of units required to break even.
- Standard costs can be adjusted regularly to recognize the fact that learning causes labor costs to decrease.
- In capital budgeting, labor costs can be projected more accurately over the life of the capital investment.
- Production and labor budgets can be adjusted to accommodate learning curves.
- More effective evaluation of managers.

### Limitations

- Only applicable in a situation in which experience leads to improvement (labor intensive tasks).
- Assume that the learning curve rate is constant, when in reality it probably is not.
- Assume that all increases in productivity are due to the learning process, when there may be other factors causing the productivity increase.

## Expected Value

Calculate: Each of the possible outcomes (x) the likelihood (probability) of that outcome occurring. All of the results are then added together to determine the (Expected value)

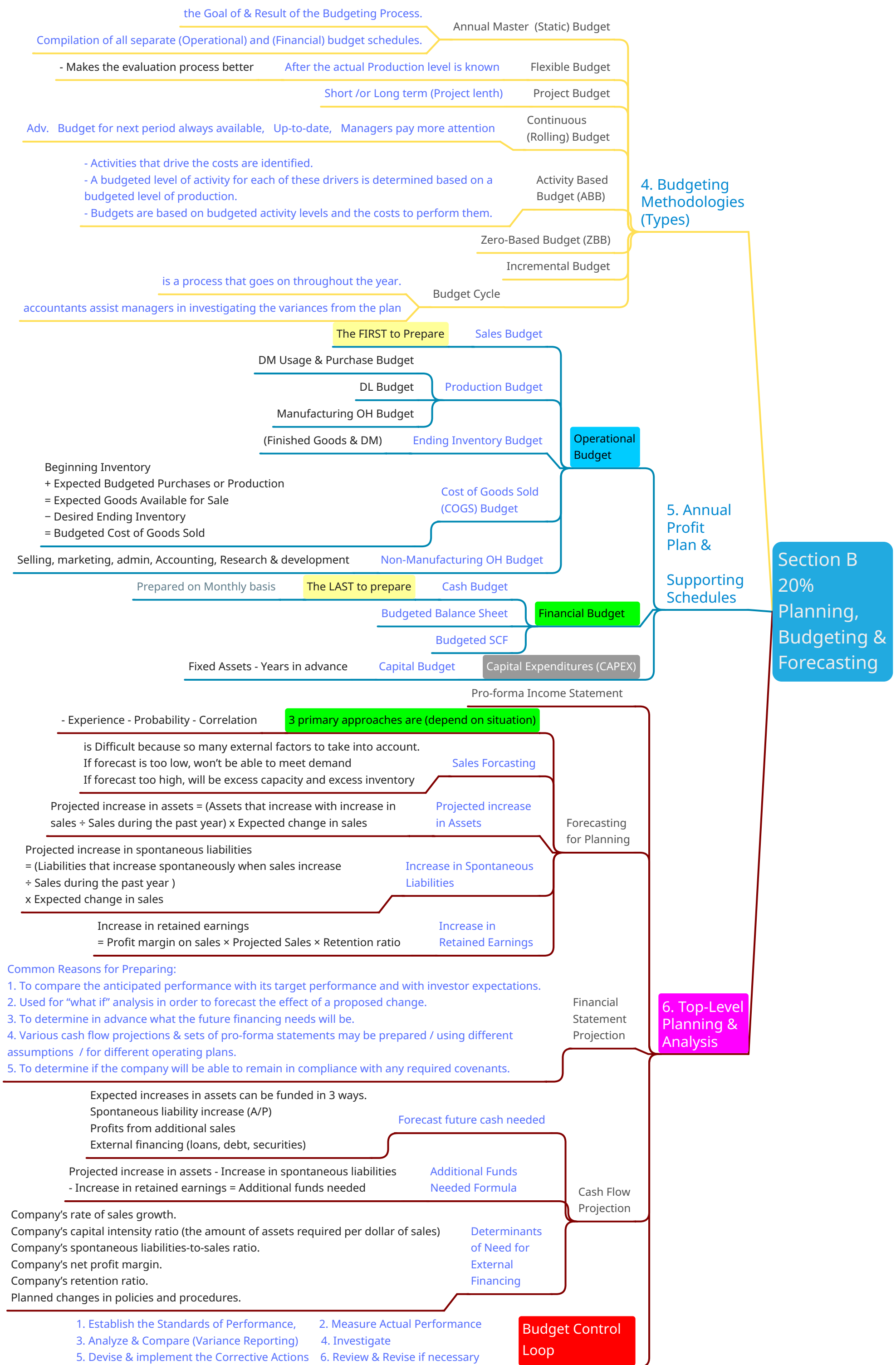
Methods of assigning Probability

Classical method  
Relative frequency method  
Subjective method

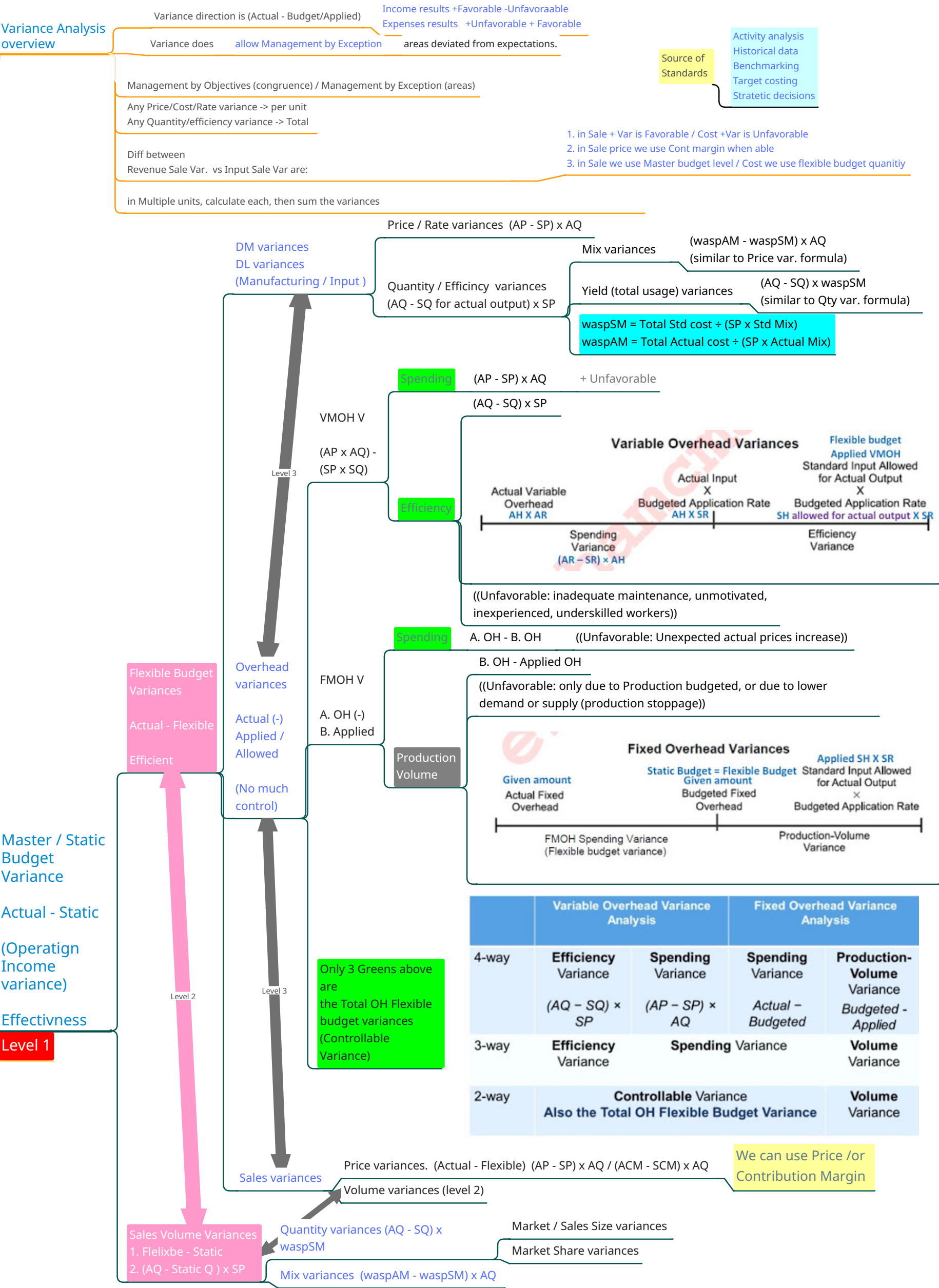
Variance & Standard Deviation

- Both (Variance  $\sigma^2$ ) & (Standard Deviation  $\sigma$ ) give us the variability of the possible values in a probability distribution
- Both measure the diversity of the possible outcomes.

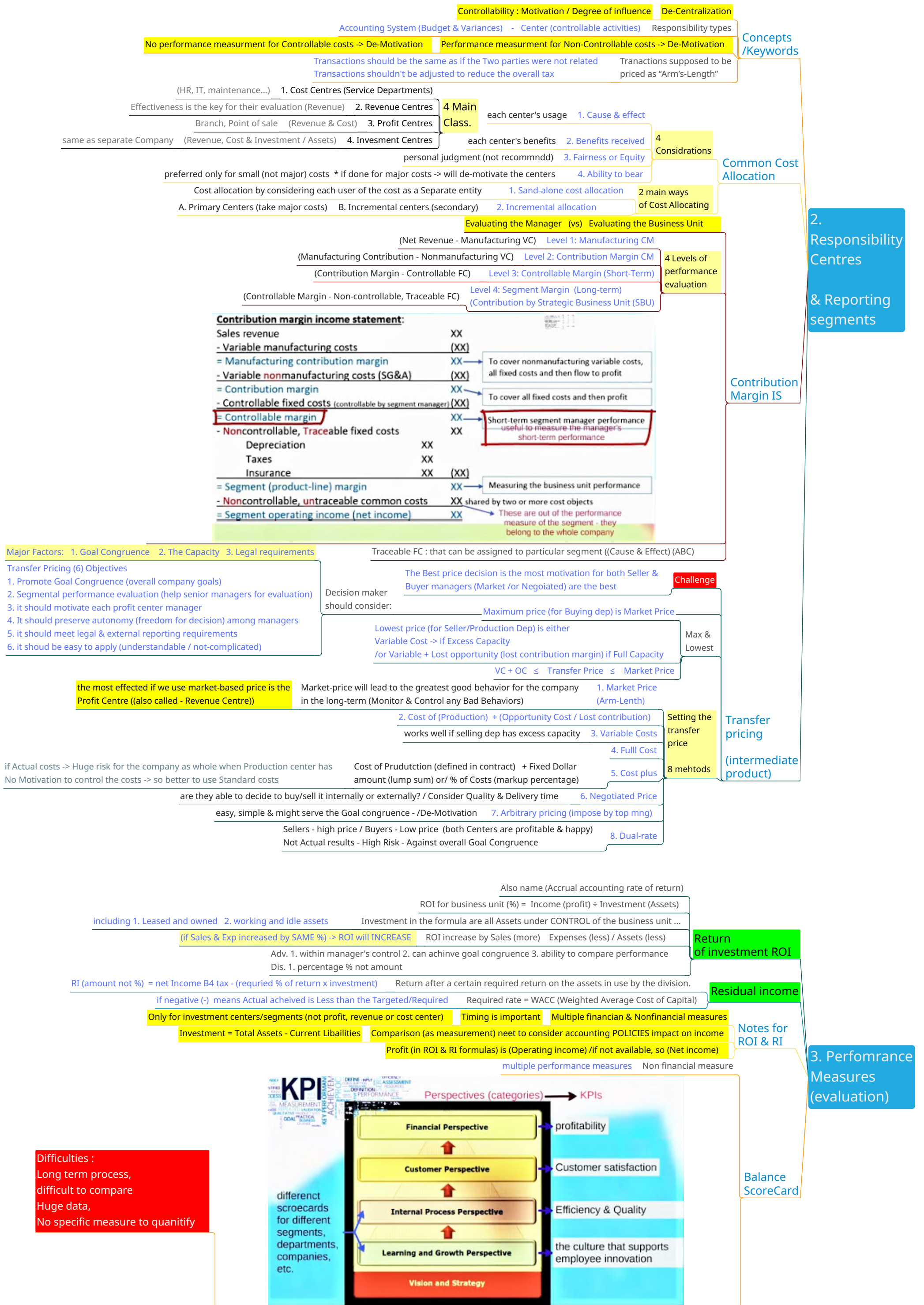




Section C  
20%  
Performance Management  
1. Cost & Variance Measures







1) Measurement Concepts

Cost Management Terminology

(DM Used\* + DL Used + MOH applied = Manufacturing costs ) + Beginning WIP – Ending WIP = C.O.G.M  
Beginning Finished inventory + Purchases for a reseller /or C.O.G.M for a manufacturer – Ending Finished inventory = C.O.G.S

- Cost behavior & relevant range
  - Variable (cost per unit increase - production increase)
  - Fixed (cost per unit decrease - production increase)
  - Mixed high low method : (highest - lowest cost ) ÷ (highest - lowest units) = V. per unit
- Tractability
  - Direct
  - Indirect Allocation rate = indirect costs ÷ Allocation base (cost driver)
- Nature of cost
  - Manufacturing (Production / Inventoriable costs)
  - Non-manufacturing (SG&A / Period costs / Non-inventoriable)

Note: (semi-variable) & (semi-fixed) costs

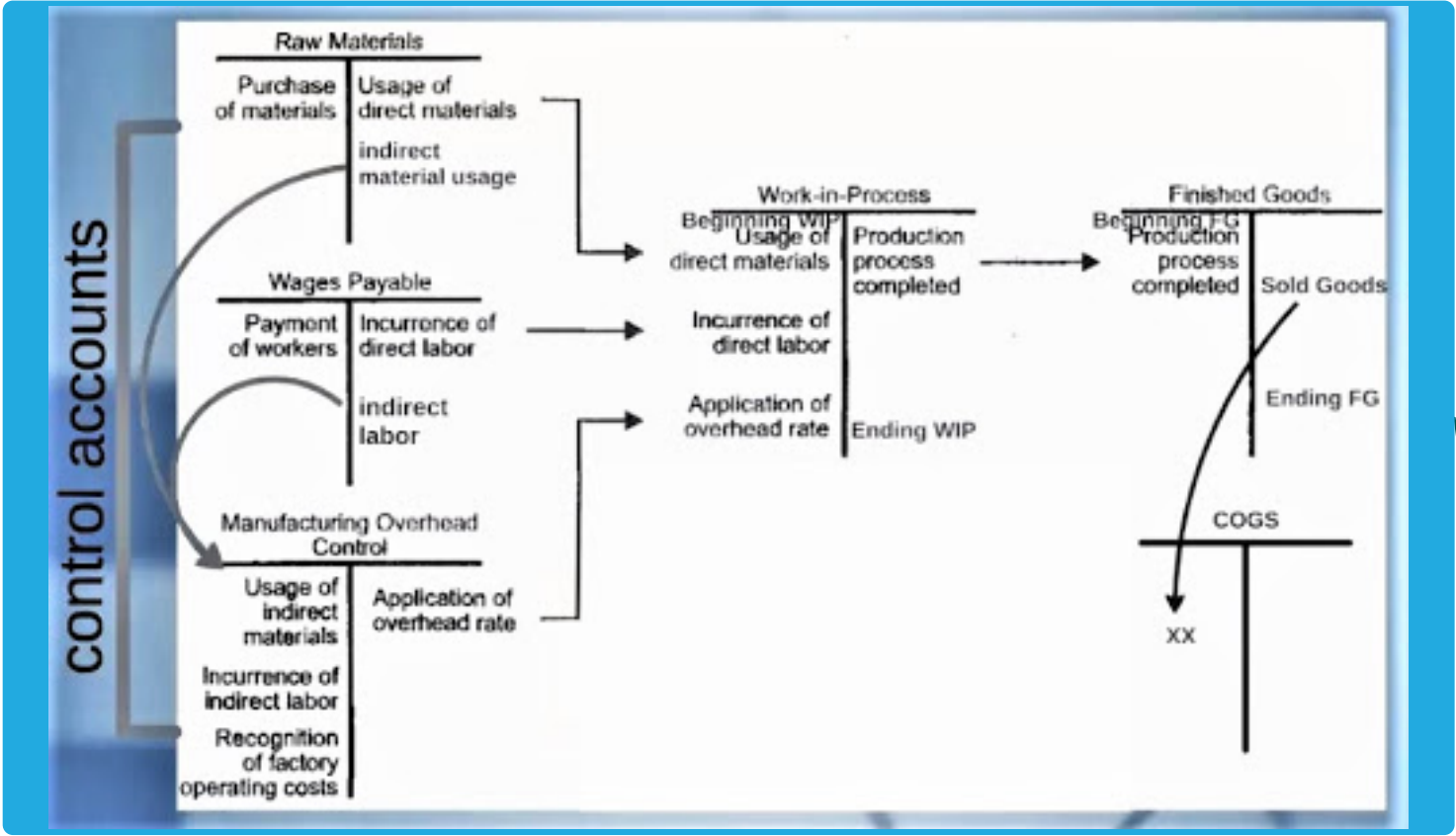
	Absorption Costing (Required under GAAP)	Variable Costing (For Internal Reporting Only)
Product Costs (Included in Cost of Goods Sold)	Variable production costs	
	Fixed production costs	
Period Costs (Excluded from Cost of Goods Sold)		Fixed production costs
	Variable S&A expenses	
	Fixed S&A expenses	

Cost Classification

Sales revenue	Sales revenue
- Cost of goods sold - variable and fixed manufacturing costs of items sold	- Variable manufacturing costs of items sold
= Gross profit	= Manufacturing contribution margin
- Variable nonmanufacturing costs (expensed)	- Variable nonmanufacturing costs (expensed)
- Fixed nonmanufacturing costs (expensed)	= Contribution Margin
= Operating Income	- All fixed manufacturing costs (expensed)
	- All fixed nonmanufacturing costs (expensed)
	= Operating Income

Price costs = DM + DL /& Conversion costs = DL + MOH  
Note: period costs may allocated to production for INTERNAL decision (for pricing)

- Other Costs Classifications (For decision making)
  - Controllable / Non-controllable (specified manager)
  - Relevant / Sunk Costs
    - Relevant (1) future scenario (2) differs for multiple options
    - Sunk costs incurred (historical) or Committed (past decisions)
  - Incremental / Differential Cost
  - Outlay (explicit cost) / Opportunity costs (implicit costs) (Note: Economic costs = implicit + implicity costs)
  - Avoidable / Committed (past decisions / un-avoidable)
  - Engineered (direct) / Discretionary (budgeted - to achive - no strong input & output)
  - Joint & Separable costs (Oil, Petrol & Asphalt)
  - Normal / Abnormal spoilage
    - normal to prduct (manufacotring) costs
    - & Abdnormal to period costs
  - Rework , Scrap & Waste Rework (related to finished goods) & Scrap /Waste (related to Raw materials)
  - Carrying costs / Stock out costs Carrying costs : Storing or inventory costs includes implicity & explicit
  - Transferred in costs (between production departments)
  - Value adding / non-value adding costs (process analysis) (affect quantitiy, quality & responsiveness )
- Capacity Levels
  - 1) Supply denominator level concepts
    - Not Used Theoretical (ideal) (bigger capacity gave wrong allocation rate per unit)
    - Best for pricing decision Currently attainable (practical) capacity = theorectical capacity - idle time & downtime
  - 2) Demand denominator level concepts
    - Best for current performance evaluation (Master budget capacity)
    - Best for long term planning (Required for (GAAP), Normal capacity OH standard costs, Average of master capacity)



FOH ACCOUNT BALANCE

- if balance is IMMATERIAL  
-> to Only C.O.G.S

- if balance is MATERIAL  
-> to  
1- WIP,  
2- Finished Goods  
3- C.O.G.S



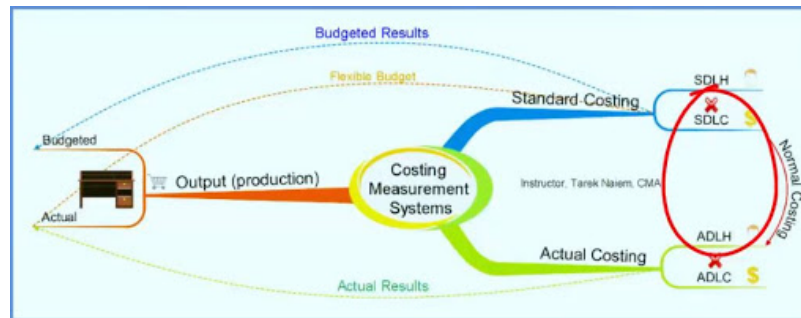
3 main measurement systems

Differ in what rate is used to allocate DM, DL & OH application rate & OH allocation base

Method	Used With	DM/DL Application Rate	DM / DL Application Base	OH Application Rate	OH Allocation Base
Standard Costing	Process Costing or Job Order Costing	Standard Rate	Standard Amount <b>Allowed</b> for Actual Production	Pre-determined <b>Standard</b> Rate	Standard Amt of Allocation Base <b>Allowed</b> for Actual Prod.
Normal Costing	Job Order Costing	Actual Rate	Actual Amount <b>Used</b> for Actual Production	Estimated <b>Normalized</b> Rate	Actual Amount of Allocation Base <b>Used</b> for Actual Production
Extended Normal Costing	Job Order Costing	Estimated <b>Normalized</b> Rate	Actual Amount <b>Used</b> for Actual Production	Estimated <b>Normalized</b> Rate	Actual Amount of Allocation Base <b>Used</b> for Actual Production
Actual Costing	Job Order Costing	Actual Rate	Actual Amount <b>Used</b> for Actual Production	Actual Rate	Actual Amount of Allocation Base <b>Used</b> for Actual Production

Measurement

If MOH is ...	Material variance Allocation	Immaterial variance Close to COGS
Underapplied Applied OH < actual OH	Increase WIP Finished goods COGS	Increase COGS
Overapplied Applied OH > actual OH	Decrease WIP Finished goods COGS	Decrease COGS



2) Cost Accumulation Systems

Step 1:

	DM	Conversion
BWIP	150	60%
+ Started	550	40%
Total units to account for	700	
Completed	620	
+ EWIP	80	
Total Units to account for	700	

FIFO	
Total units completed	620
- BWIP (regardless of % of completion)	(150)
Units started and completed this period	470
+ Amount needed to complete BWIP	0
+ Amount completed on EWIP	80
EUP under FIFO	550

WA	
Total units completed	620
+ Amount completed on EWIP	80
EUP under FIFO	700
Cost / EUP	\$1.5

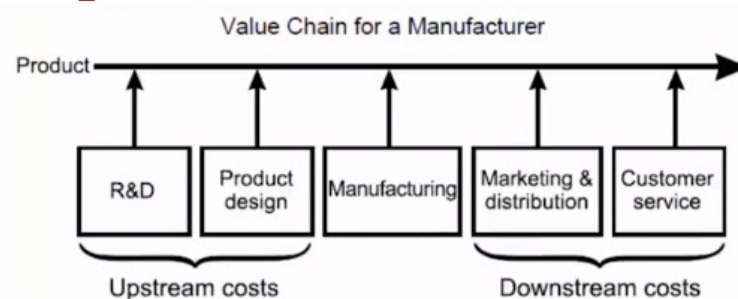
Process Costing

Accumulation

(just standard OH allocation) Customized, Unique, heterogeneous Job Order Costing  
different materials (job costing) + conversion (DL & MOH) similar (process) Operation Costing (combination)

significant R&D costs

- 3 categories:
- 1) upstream costs
  - 2) Manufacturing costs
  - 3) Downstream costs



Life Cycle Costing

Over/under applied

(Plant-Wide range)  
(Peanut-butter-costing)

Traditional SINGLE Rate

Traditional Departmental Rate

Volume base

(Cause & effect relationship)

Terms: 1. Cost object / 2. Cost driver (Structural / Executional)

Types: Value adding / Non-value adding

Categories: 1. Unit-level 2. Batch-level 3. Product=sustaining 4. Facility-sustaining

Activity Based Costing (ABC)

Allocation

Normal (product cost) / Abnormal (period exp)

Accounting for Spoilage

(go to page D-P1)

Absorption & Variable Costing

Direct Method - Step Down Method - Reciprocal Method

Multiple Service Departments

Service Departments

Sum Total (fixed + variable) Single-rate  
(differentially) Fixed / Variable Dual-rate method

One service department

too optimistic (many units- low MOH per unit)

too pessimistic (less units / high MOH per unit)

if the Company is

best for PERFORMANCE

1. Expected Actual Capacity / or Master budget capacity

best for PRICING

2. Practical or currently attainable capacity

best for LONG-TERM planning

3. Normal Capacity

Not used

4. Theoretical or ideal capacity

Choices for level of activity

Level Activity to use

Overhead Cost Allocation

3) Cost Allocation Systems

(X) Product sales / total sales of all x joint cost 1) Relative Sales Value at Splitoff

Future sales price - Separable costs after splitoff = Est net realizable value 2) Estimated Net Realizable Value

weight, volume or other physical measure 3) Physical Measure and Average Cost

Joint products allocation methods

Joint Products & Byproducts

1) Gross profit for all in % 2) Gross profit for each 3) Profit - separable costs = joint cost for each

4) Constant Gross Profit (Gross Margin) percentage

(estimated NRV) reduces (inventory cost of Main Products) 1) Production method (inventory acc)

only if it is sold Either (a) Revenue or (b) reduce costs of Main products 2) Sales method

Byproducts Costs



1. identify the Activities that Add Value or non-added Value) to the Customer (ABM)
2. identify the Cost Driver for each activity (ABM)
3. Develeop a COMPETITIVE ADVANTAGE (add value / reduce costs)

Value Chain Analysis  
(customer's  
point of view)

made up of

1. Primary Activites : (Upstream (R&D) + Manufacturing + Downstream)
2. Support activites -not Secondary : Infrastructure, IT, materials, HR

Value Added  
Concepts

Value Chain Measure (Manufacturing cycle efficiency)

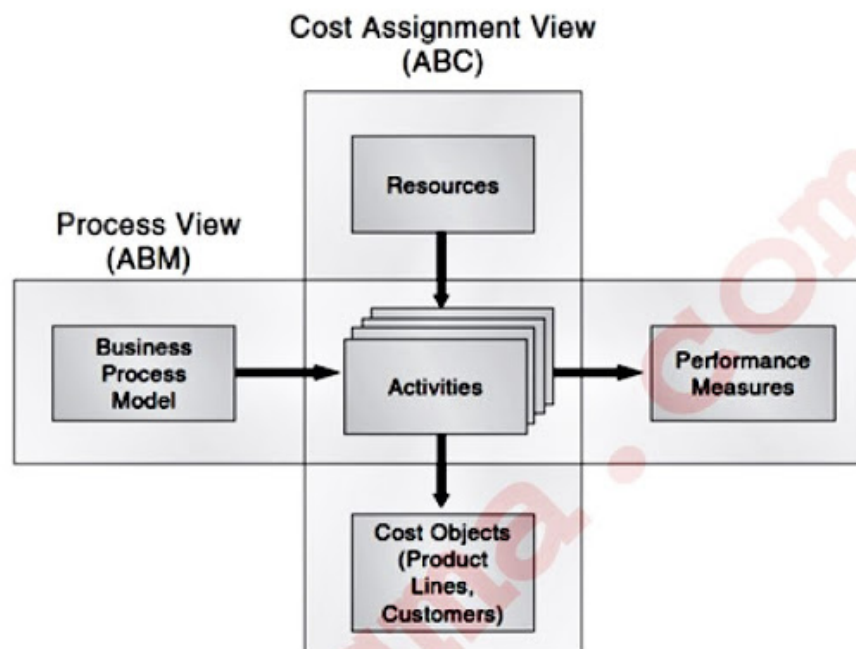
= Time of value added manfuacturing ÷ Total time of manufacturing cycle

Divided into:

Operational  
ABM

&

Strategic  
ABM



Activity Based  
Management  
ABM

less risk & great results

Process analysis : Incremental & Constant Changes

high risk

Steps : 1. identify what we do better  
2. determine what process uses for value products

Priority : 1. process is most dysfunctional  
2. greatest impact on customers  
3. most feasible

Process Reengineering:  
/ Fundmental Changes  
/ radical  
/ dramatic  
/ heavy blasting

Process Analysis

1. Best in class levels
2. Best practice analysis

2 Types

IN ORDER : 1. Identify Cretical Success Factors the Processes /  
2 Do best practice analysis & document it /  
3. identify improvements areas

Steps

Benchmarking  
(mix-skills team)

design, supplier evaluation, training, ...

Prevention costs

inspection, testing

Appriaisal costs

Conformance costs

we findout (rework, scrap ...)

Internal (Before shipped)

Non-Conformances

customer findout (warranty, ...)

External (after Shipped)

costs (failure costs )

Cost of  
Quality Analysis  
\* Exam \*

Enhance product quality / Timely response / Eliminate non-value  
adding work /flexibility in customer requests

Objectives:

1. Support of Top mngmt
2. Clear & measurable objectives
3. Reqcgize quality achivements
4. Training
5. continuous impr
6. Satisfying the customer's expectations
7. Involve all Employees

Core  
Principles  
of TQM

Total Quality  
Management  
\*\* EXAM \*\*

1. Control Chart
2. Histogram
3. Pareto diagram
4. Cause & effect diagram (Ishikawa diagram)

(Machine, Materials,  
Methods & Manpower)

Analyzing Quality  
Problems

most compatible

TQB & ABC

Process Analysis

(slow / incremental changes) - or Re-  
engineering

Continuous Improvements Concepts  
(KAIZEN)

0. Benchmarking.
1. Prioritizing improvment areas
2. Walkthrough
3. Mapping
4. Design
5. Risk & benefit

Assessment  
Current

1. Training
2. Reducing close cycle
3. Centralization
4. Cloud-based

Planning / Implementing  
the Redesign

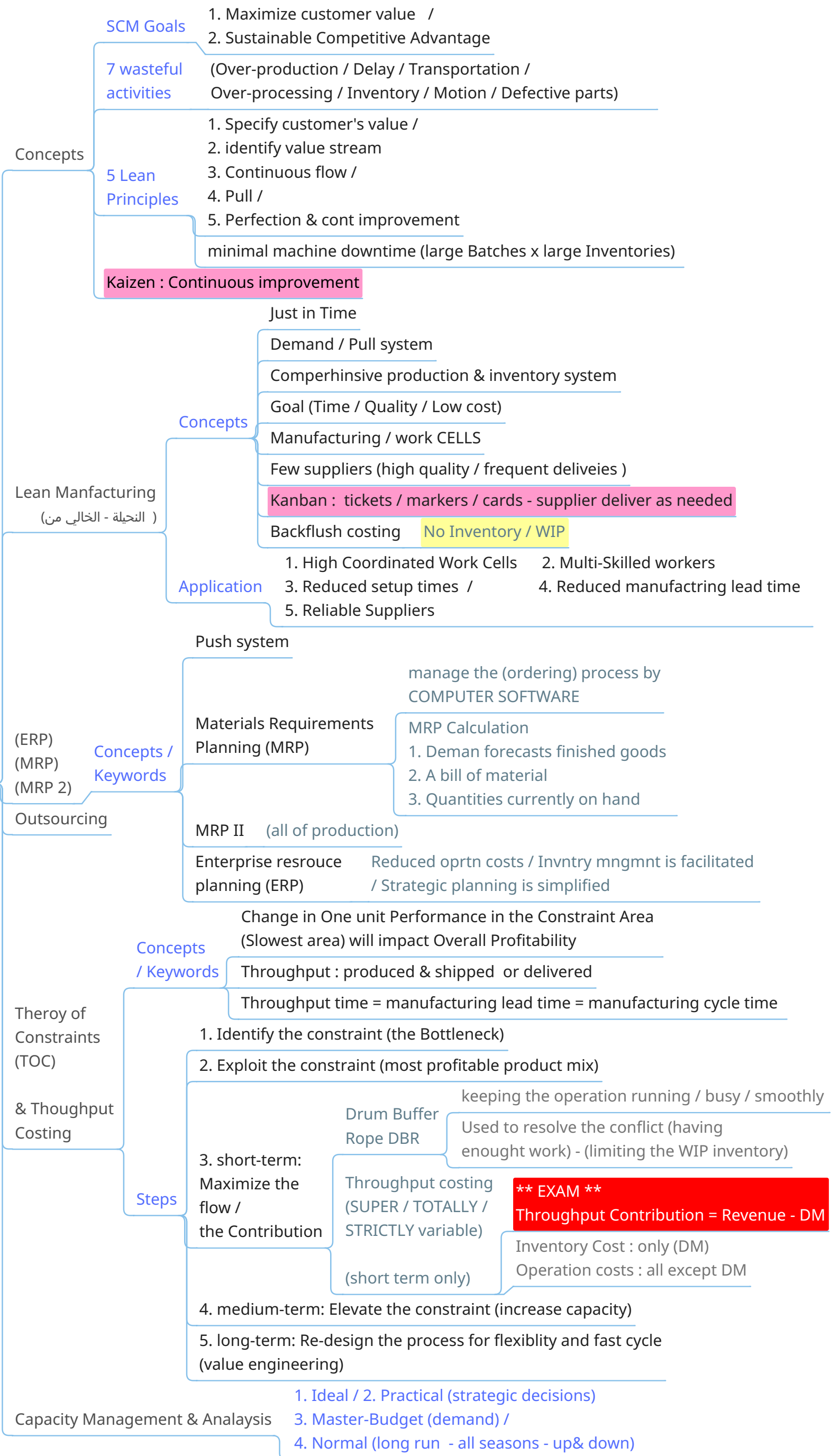
Effcient Accounting  
Process

5) Business  
Process  
Improvement

Section D  
15%  
Cost  
Management

Section D  
15%  
Cost  
Management

4) Supply Chain  
Mngmnt  
(Operation  
efficiency)



# 1. Corp Governance

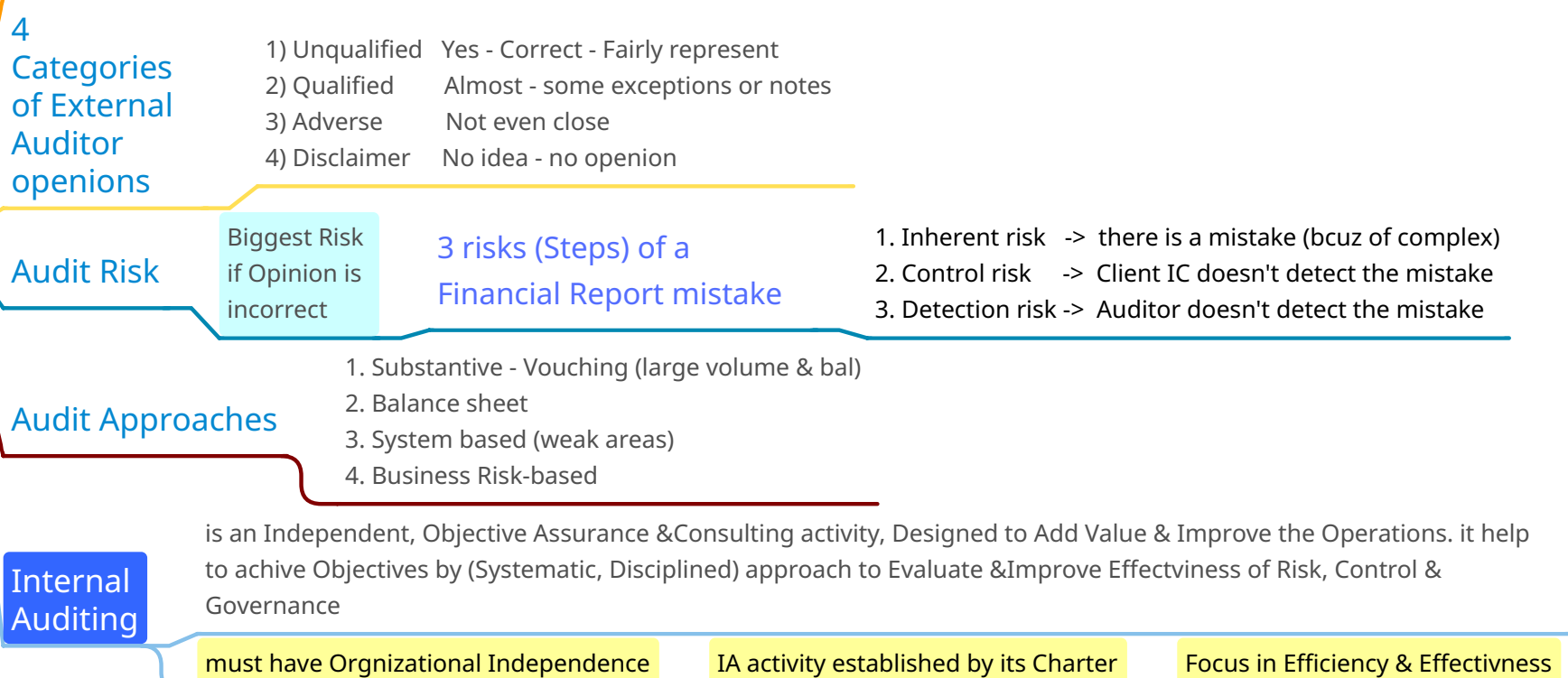


**2 Reports must provide for Publicly traded Companies**

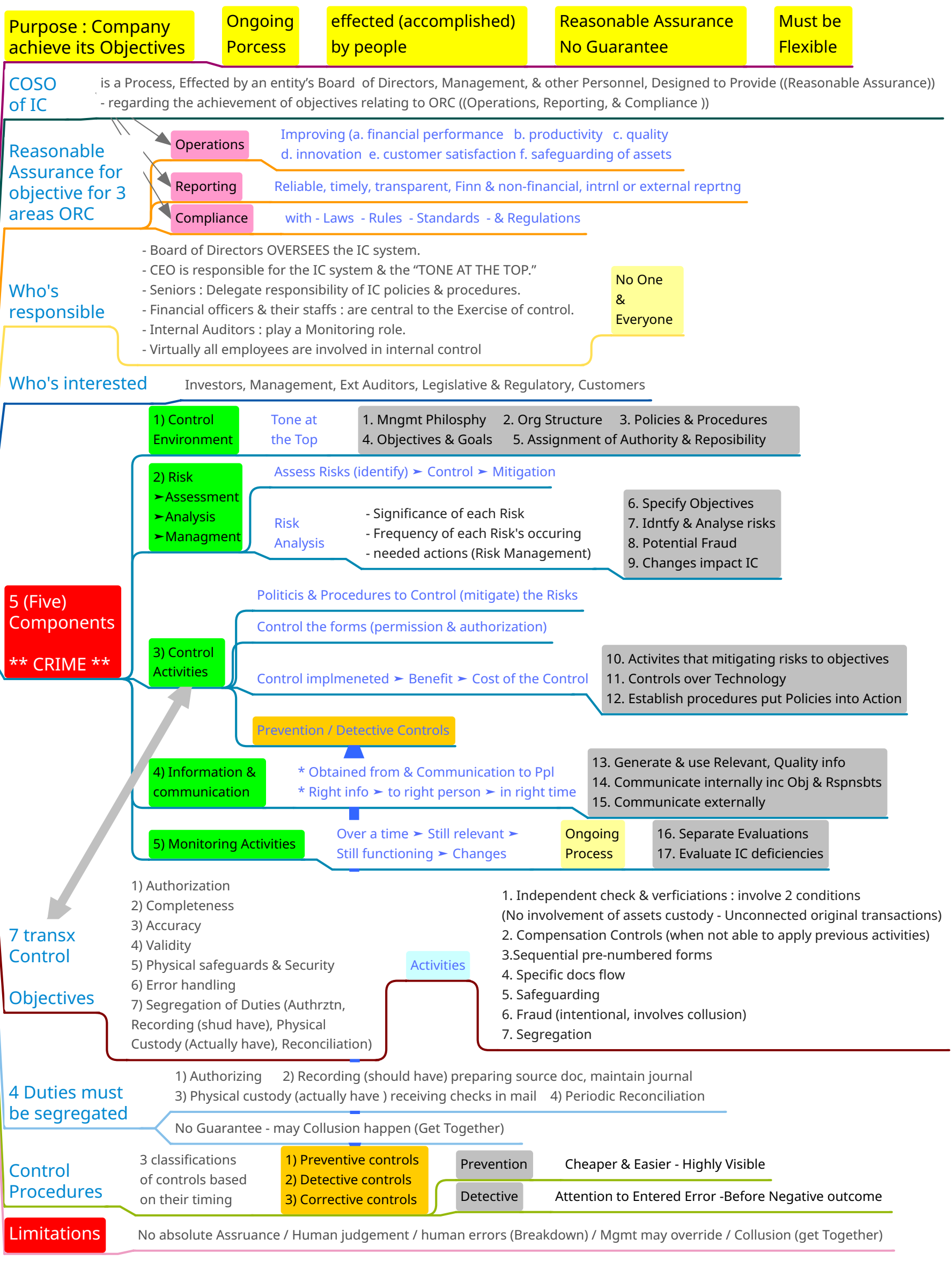
- 1) Opinion if the FS (present fairly, in conformity with GAAP).
- 2) how effectively is internal control (wkns) over financial reporting

**Under PCAOB, Ext auditor must issue a report on IC (if company is Publicly traded)**

# 4.External Auditor PCAOB Adt Stndrds







Whole Company Responsibility

✓ Intentioned of Corrupt Pymnt (done or not)

✓ all companies

1) Anti-bribery provision

proper Accounting Records is mandatory

Only Publicly Traded SEC

2) Internal control provision  
(or Accounting Provision)

2 Laws /  
Provisions

Foreign Corrupt  
(1977)  
Practices Act  
(FCPA)

Applies to All publicly-held companies in the U.S., all of their divisions, & all of their wholly-owned subsidiaries.

- ★ 5 members (app by SEC)
- ★ Financially Literate (not expert)
- ★ must be from Private sector
- ★ Only 2 can be CPAs

PCAOB Board Includes

1. Registering public accounting firms that will audit
2. Establishing the Standards for Audit Reports
3. Inspections
4. Enforcing Compliance
5. Conducting (Investigations, Disciplinary, Sanctions)
6. Management operations & Board

Responsibility

1. Public Company  
Accounting Oversight  
Board (PCAOB)

1. Bookkeeping
2. Financial info system
3. Appraisal (valuation)
4. Internal audit
5. Mngmt
6. HR
7. Broker/dealer
8. Legal
9. Expert
10. any services PCAOB is not permissible

201.  
Services Outside the Scope  
& Practice of Auditors

- |                                      |                  |                    |
|--------------------------------------|------------------|--------------------|
| Lead Audit partner                   | - Rotate after 5 | - Remain off for 5 |
| Other Audit partners                 | - Rotate after 7 | - Remain off for 2 |
| Specialty partners (tax / valuation) | - No Rotation    |                    |
| Technical partners                   | - No Rotation    |                    |

203.  
Audit Partner Rotation

2. Auditor  
Independence

1. All critical accounting policies & practices
2. All alternative treatments within GAAP discussed with Mngmt
3. other Material written communication

204.  
Auditor Report to  
Audit Committees

1. Reveiwed
2. Not-Contain Untrue / or Omitted Facts
3. Fairly represent

Signing the  
Financial Reports:

Financial Ofcr  
(F. Rep Cert.)

3.  
302.  
Corp  
Responsibility  
for Financial  
Reports &  
Internal  
Control

Sarbanes  
-Oxley  
(SOX) -  
Act 2002

4  
Titles

- ★ (Est & maintaining) Internal Control (IC)
- ★ Designed the IC to cover (Significant info)
- ★ Evaluated the IC effectiveness (90 days prior to Report sign)
- ★ Reported their Findings on IC

1. Responsible for

Exect Ofcr  
(IC Cert.)

- ✓ All Deficiencies in Design/Operations of IC
- ✓ Any fraud
- ✓ Significant changes of IC

2. Disclosed to Audit  
Committe & Ext auditor  
( Significant disclosure)

begin with Risks to ICFR

Top-down approach

1- Evaluation is basede on Risk  
assessment

2- Adequately address the risk  
(mis-statement of FS not be  
prevented or detected in a  
timely manner)

2 Two  
principles

SEC  
No33-8810  
Guidance  
for IC

Req of  
Mngmt

1. Statement of Mngmt's responsibility for IC
2. Mngmt's assemssment / evaluation of the effectiveness
3. Standards used in evaluating the effectiveness (ex. COSO))

404.  
Mngmt  
Assessment  
of Internal  
Controls

PCAOB Auditing Standard 5 Gudiance

1. Issue attested report for IC evaluation (integrated with) FS audit report
2. Express 2 openions of FS (Compliance with GAAP) + ( Accurate transx)

Req of  
Ext  
Auditor

4.  
Enhanced  
Financial  
disclosure

if, NO, must disclose why not

Disclosure  
if Audit  
Committee has  
a Fnncl Expert

407.  
Disclosure of  
Audit Committee  
Financial Expert

if One, must disclose his name & if he is independence

if more, must may (optional) disclose their names

Definition  
of Financial  
Expert

1. Understanding of GAAP & FS & ability to assess the application of GAAP
2. Experience in preparation of auditing of FS
3. Experience & understanding of internal Accounting Contorls & Procedures for FS
4. Understanding of Audit Committee functions

Section E  
15%

1.  
Governance,  
Risk, &  
Compliance  
& Internal  
Control

5. Legal  
Aspects  
of Int  
Controls

Info Systems (IS)

Objectives

- 1. Promoting effectiveness & efficiency of operations
- 2. maintaining Reliability of FR
- 3. Assuring compliances with Laws & regulations
- 4. Safeguarding assets

Major Goals

Availability / Confidentiality / Integrity

Threats of IS

- 1. Errors in system Design
- 2. Errors in data Transmission
- 3. data can be Stolen (internet)
- 4. data & programs can be Damaged
- 5. programs can be altered by dis-honest employee
- 6. viruses, Trojan horses & worms (crash or stolen or damage)
- 7. Physical facilities can be damaged

Guidlines

Based on  
2 Docs

- 1. Report of the Committee of Sponsoring Org (COSO - Internal Control - Integrated Framework)
- 2. Control Objectives for Information & related Technology (COBIT) - authored by the IT Governance Institute - published by the Information Systems Audit & Control Foundation (ISACF)

1. General Control

- 1. Org & Operation of computer facility (inc. Segregation of duties - Most important)
- 2. General Operating procedures (inc. written manuals)
- 3. Equipment & hardware controls (inc. Backups)
- 4. Access Control (inc. Physical access & Paswords)

Segregation of Basic Responsibilities / Functions / Duties : Authorization - Record keeping - Assets custody / System Analysts (design) NOT to be Programmer / Programmer NOT to access Live data / Operators (users) NOT modify the program / users NOT to access physical assets / Authorized only can Call Vendors support

Specific to individuals

designed to prevent, detect & correct errors

Reasonable assurance ➤ (Authorized, Complete, Accurate) data

Highest risk of Errors (bcuz of Human involvement)

Observation ctrl (Before entry) / Transcription ctrl - entered correctly / Tests (after)

1. Input controls

Online input

- 1. Preformatting ➔ forcing data to all necessary fields
- 2. Edit checks ➔ prevent/detect/correct Certian types of incorrect data (dropdown menus)
- 3. Limit checks ➔ Certain amounts can be restricted
- 4. Check digits ➔ Algorithm, ex. Customer codes

Batch input

- 1. Mngmt release ➔ batch release upon review & approval
- 2. Record count ➔ batch release when nu of record matches user calculated
- 3. Financial total ➔ batch release when dollar amount matches user calculated
- 4. Hash total ➔ sum of numeric field that has no meaning can serve as a check

Main Categories

2. Processing controls

Reasonable assurance ➤ 1. Processed correctly 2. Approved

Validation : Identifiers are matched against master files to determine existence (Codes)  
Completeness : to reject any record with missing data  
Sequence check : logical order

3. Output controls

Assurance that Input & Processing has resulted a Valid Output (valid = Complete & Accurate) (pre-numbered forms)

- 1. Audit trail (all tranx details)
- 2. Error listings (all rejected tranx)

4. Storage controls

Dual write routines ➔ 2 separate physiscal devices  
Validity checks ➔ structure validity  
Storage physical controls ➔ hard drives in Secure rooms & Portable in locked storage areas

Different Categories

- Preventive (job rotation, dual access, preformatted)
- Detective (batch totals, Turn around docs)
- Corrective (discrepancy reports, upstream, resubmissions)

Rollback processing

used to prevent any transactions being written to disk until they are complete

Consistent processing

each transaction has access to all the files and data that it needs to be processed

InConsistent processing

Unrecoverable Tranx

Any failure during processing (Ex: power), Tranx are only Partially Processed

Deadly embrace (Deadlock) / (Retrieval Contention)

Two different app/tranx, Each have a LOCK on data that is needed by the other app

Steering Committee

- 1. Approve development projects
- 2. Assign resources
- 3. Ensure that required sys dev are aligned with Org Strategic Plan

Changes should be initiated by End User & authorized by Mngmt or Steering Committee

3. System Development control

8 stages of the development process

- 1) Objectives
- 2) Investigation & feasibility study
- 3) Analysis
- 4) Conceptual Design
- 5) Physical Design
- 6) Development & testing
- 7) Implementation & conversion
- 8) Operations & maintenance

Steps of IS development

- 1. Changes should be made to a (Working Copy) of the program
- 2. Should be (Tested)
- 3. Testing must be with (incorrect data)
- 4. Changed programme code should be (stored in Secure library) during the testing
- 5. Unauthorized changes can be detected by (Code Comparison)

4. Physical Controls

1. Physical access

Limit access to comp centre to authroized operators

2. Enviromental controls

Comp centre should be quipmmnt with a Cooling & Heating system

5. Logical Controls

1. Authentication

User & pass

- 1. Difficult to guess
- 2. Ideally
- 3. Force password change periodically

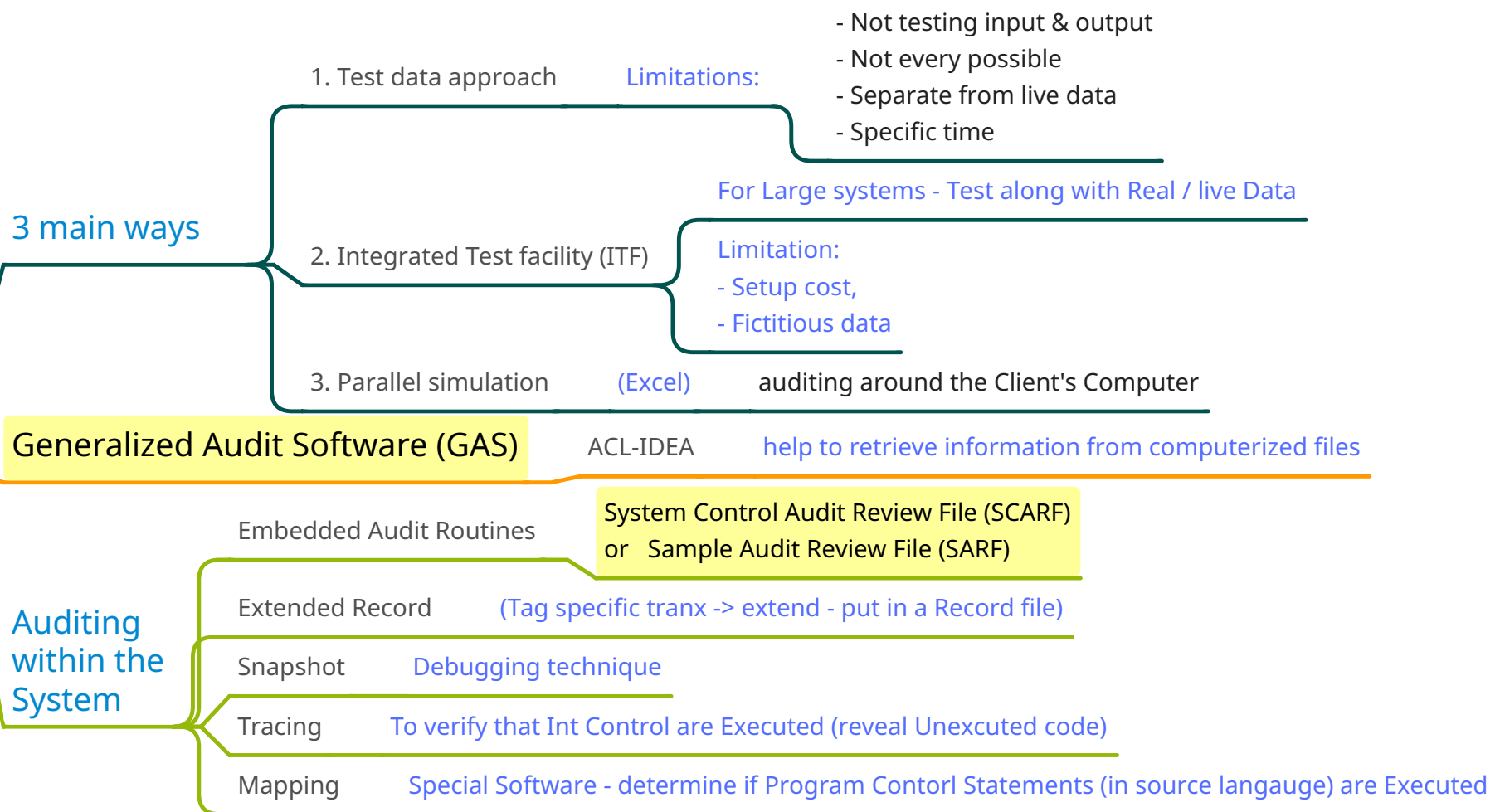
2. Authorization

- A. Users can only access programs/data necessary to their job duties
- B. view data not change

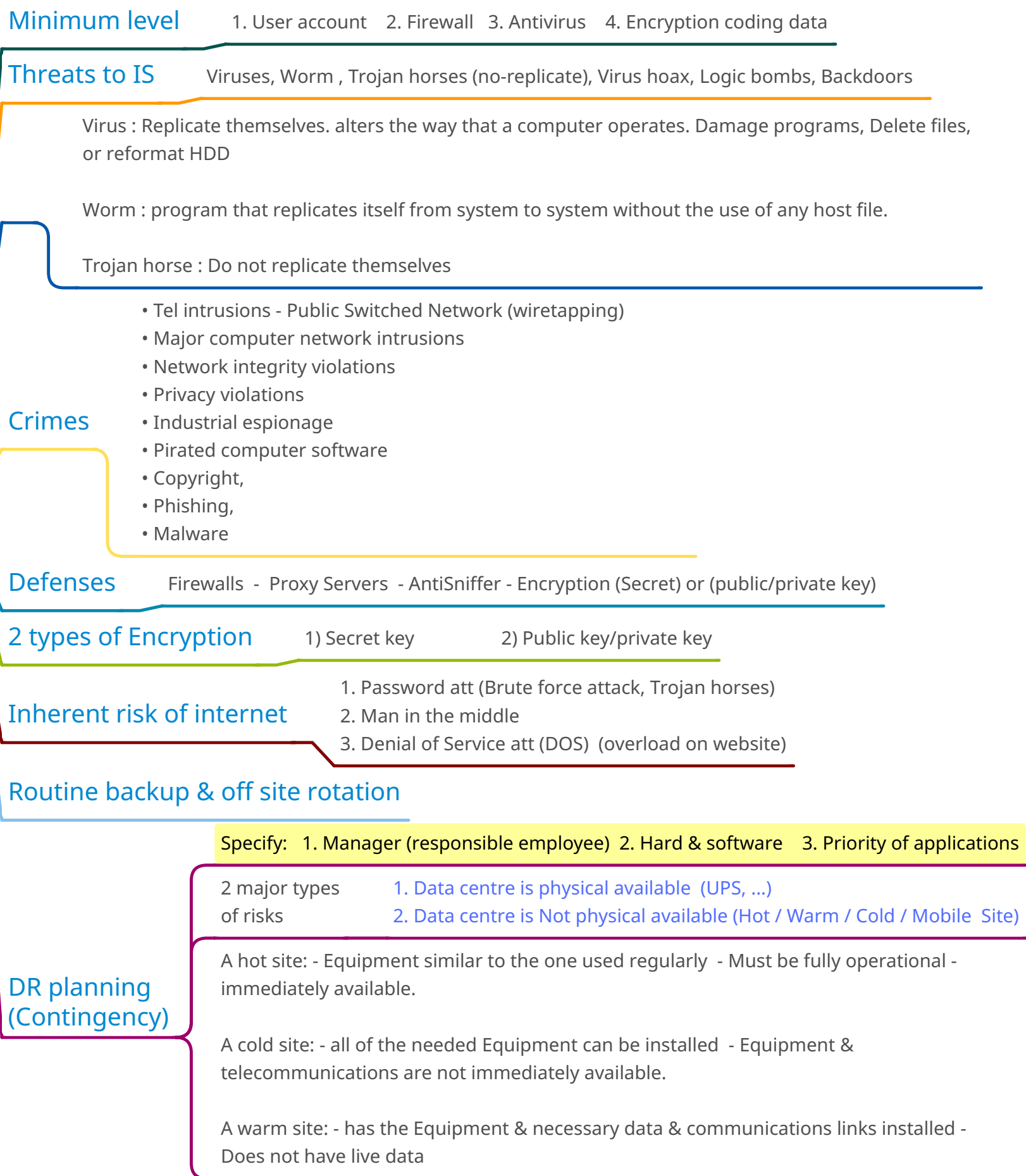
Cate-gories

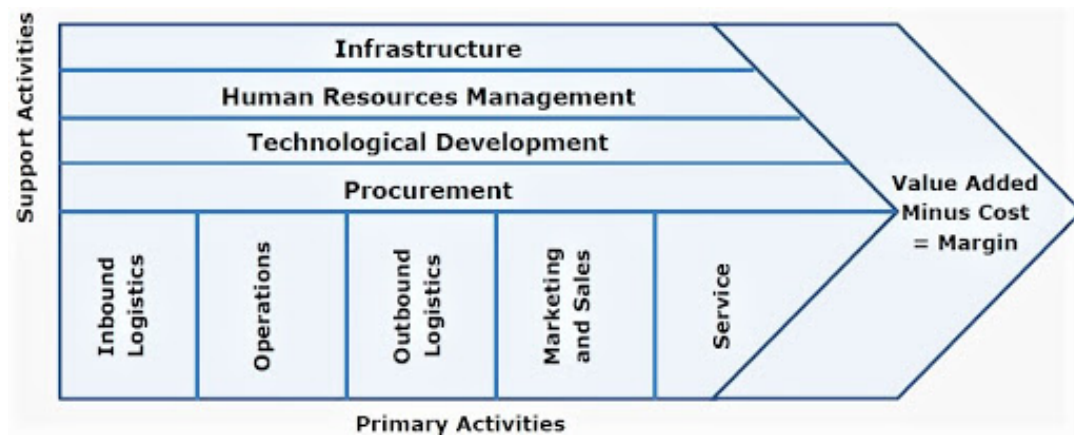


# Audit / Testing Comp Systems



# Internet Security





Supply Chain & AIS

Add Value

by providing accurate and timely information so that all of the value chain activities can be performed efficiently and effectively

AIS

Elements of Automated AIS

Journals ♦ General Ledgers ♦ Chart of accounts

Master files : permanent info (G/L account numbers / History or Customer account No / Historical data for each customer)

Transaction files : used to update master files Remember (Transaction Codes)

Block Codes : numbers for accounts in GL chart of accounts

Modules : Special journals are used for specific kinds of transx & in a computerized system

Output of Automated AIS

1. Should include a date or dates 2. Should be consistent over time 3. Should be in convenient format (info that is easy to identify / Summary reports for financial totals / Comparative reports (Related numbers))

AIS Tranx Cycles

• Revenue to cash cycle. • Purchasing & expenditures cycle. (FOB shipping point) • Production cycle. • HR & payroll cycle. • Financing cycle. • Fixed asset cycle • General ledger & Reporting systems.

Financial Reporting Sys (External)

(BS, IS, Stt of Cash flows, Stt of Comprehensive income & Changes in Equity) + (Trial Balance / GL)

Management Reporting Sys (Internal)

Cost Accounting systems

(Profitability) Reporting Systems ♦ & (Responsibility) Reporting System

Collection of Related data-files, Combined in 1 Location, to eliminate Redundancy, Used by different apps, Accessed by multiple users

DB & DMS

DB

Data Field ► Data Record ► Data File (table) ► Database

Primary Key a data Field in a record differentiate one record from other

Foreign Key

Connect record to other record

3 Cardinalities / Relationship types / Relationship models 1. One-to-one / 2. One-to-many / 3. Many-to-many

3 Elements of DB Structure ♦ Schema ♦ Subschema ♦ Record structure

information retrieved from DB using a query language, such as SQL.

DBMS

Def.

(Software) as an (Interface) between users & database, manages the interrelated, centrally-coordinated data files, by ((standardizing)) the storage, manipulation, & retrieval of data.

used to

Create database, maintain it, safeguard it, make it available for apps & inquiries.

4 DBMS Primary Functions

1.DB development 2.DB maintenance 3.DB interrogation (Querly lang /SQL) 4.App development

DML (Data Maniupliating Lang)

insert, delete, update

Components:

• Production planning. determining (what raw materials - when - how much). • Logistics, both inbound (materials management) & outbound (distribution). • Accounting & finance. • HR • Sales, distribution, & order management.

Features

1. Integration. 2. Centralized database. 3. Usually require business process reengineering.

Extended ERP Sys

♦Systems interface with Customers & Suppliers through Supply Chain Management app♦Give them access to internal info

Dis-advantages

♦ Business re-engineering ♦ Converting data can be time-consuming & costly ♦ if done incorrectly result for (inaccurate info) ♦ Training employees disrupts existing workflows ♦ Unsuccessful ERP transition can result in system-wide failures (so financial losses) ♦ Customers who r inconvenienced by the implementation may leave ♦ It is critical that it be completely functional & completely understood by all employees before it "goes live" ♦ No opportunities are available to "work out the bugs" or "learn the ropes" when the business relies on the one system ♦ Ongoing costs after implementation (hardware - maintenance - upgrade)

ERP sys

Data Warehouse

To be useful

1) Be free of errors 2) Be uniformly defined 3) Cover a longer time span than the company's transactions sys to enable Historical Research 4) Allow users to write Queries that can draw info from several/different areas of the DB

(copy of Hist data)

process of making the data available

1) Periodically data is uploaded 2) The datasets are transformed to be compatible with one another (Schema-on-Write). 3) The transformed data to be used for research, analysis, & other business intelligence functions.

Data Mart

subsection of a (Data Warehouse) ♦ provides users with Analytical Capabilities for a restricted set of data ♦ (Sensitive Data Security)

3 Types

1. Dependent 2. Independent 3. Hybrid

Data Lake

♦ Un-Structured ♦ NoSQL

SQL can be used as a query language with a NoSQL database management system, but SQL is not the main query language used because its usage is limited to structured data.

EPM sys CPM BPM

KPIs, Balance Scorecards, Strategy Maps

EPM software can be on premises or it can be deployed as Software as a Service (SaaS) "Cloud"

Capabilities

♦ Reports comparing actual performance to goals ♦ Reports on attainment of KPIs by department. ♦ Balanced scorecards, strategy maps, and other management tools ♦ Creating & revising forecasts and performing modeling ♦ Generating dashboards presenting current information (customized)

1.

Inf Sys (IS)

is Quality Control for Data is a Process that helps better manage & control Org data assets

Encompasses the (practices, procedures, processes, methods, technologies & activities) that deal with the overall management of the data assets & data flows

Def

All of the means by which businesses are directed and controlled (rules, regulations, processes, customs, policies, procedures, institutions & laws)

Data Gov. Includes

spells out the rules and procedures to be followed in making decisions

- Data availability, usability, integrity, security, privacy, integration ➤ System availability, System maintenance
- Compliance with regulations, ➤ Roles & responsibilities, ➤ Data flows (internal & external)

Data Gov Manages

- ✳ Identify Roles ✳ provide a Benchmark ✳ Higher Likelihood of implementing Effective Governance & Controls ✳ Break down Objectives & Activities into Groups ✳ Regulatory Compliance

Benefits

CRIME

Components

COSO's internal control framework

COBIT® is an I & T (Information and Technology) framework for the governance & management of Enterprise information & technology

it is not limited to the IT department

ISACA's COBIT

2 most prominent IT governance frameworks currently in use

IT Governance & Control Frameworks

The COBIT® Framework introduced in 1996 by ISACA, an independent, nonprofit,

COBIT® 5 was introduced in 2012 - COBIT® is now known simply by its acronym.56

ISACA published an updated version COBIT® 2019, in Nov 2018

- Stakeholder needs r considered. Conditions & options r evaluated. in order to determine balanced, agreed objectives
- Prioritization & decision-making are used to set direction.
- Performance & compliance are monitored in terms of the direction & objectives.

COBIT's purpose of Gavrnce

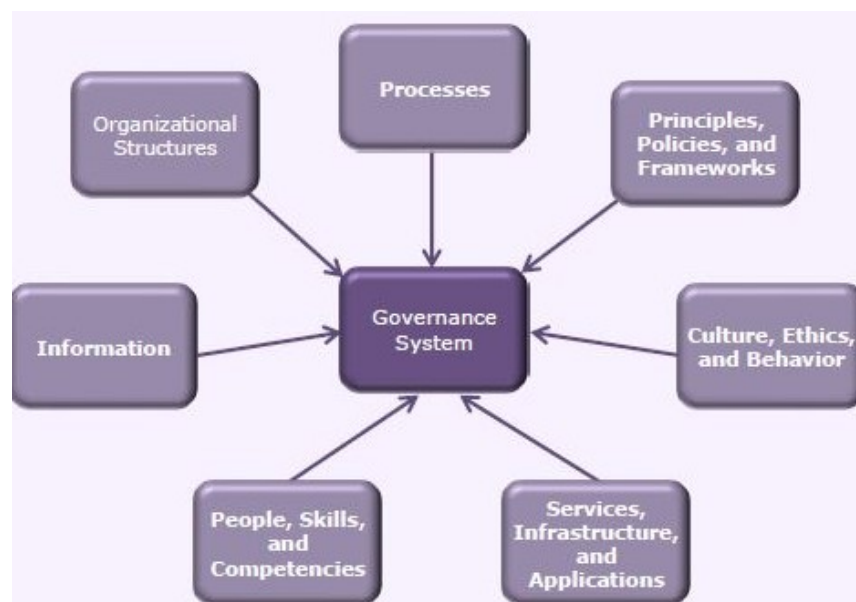
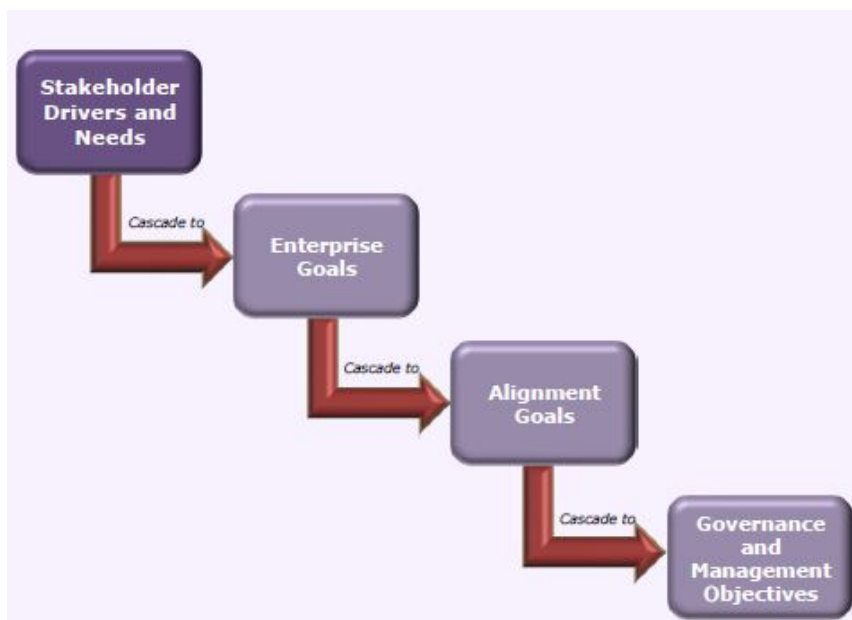
Plan, Build, Run, & Monitor Activities, in accordance with the Direction set by the body responsible for Governance (such as the board of directors) - in order to achieve the Enterprise Objectives

purpose of management

Goals Cascade

Components

Data Gavrnce



Data Capture / Maintenance / Synthesis / Usage / Analytics / Publication / Archival / Purging

Data LifeCycle

Life Cycle of data

Federal, state, & local document retention requirements / Requirements of the Sarbanes-Oxley Act of 2002 / Statute of limitations information / Accessibility / Records of records

4 Factors in Establishing a Records Management Policy

Access, change, or destroy data, interrupt business operations, or, as with Ransomware / Extortion

Cyber Attacks

process or methods of protecting Internet-connected networks, devices, or data from Attacks

Cyber Security

Copyright infringement / Denial of Service (DOS) / Buffer overflow attacks / Password attacks / Phishing / Malware / Ransomware / "Pay-per-click" abuse

Risks

Encryption / Ethical Hackers (intrusion, penetration, vulnerability testing) / Advanced Firewalls

Defenses

Controls against Security breaches

- ✳ Something you know (password)
- ✳ Something you are (fingerprint)
- ✳ Something you have (security card)

3 Strategies

Logical

2 independent actions before your access is granted

Two Factors Identification

Also

Physical

2 types of Access Controls

Walls & fences / Locked gates / Manned guard posts / Cameras / Dogs / Alarm systems / Smoke detectors & fire suppression systems



- Objectives (needs)

➤ System Analysis

➤ Development & Testing

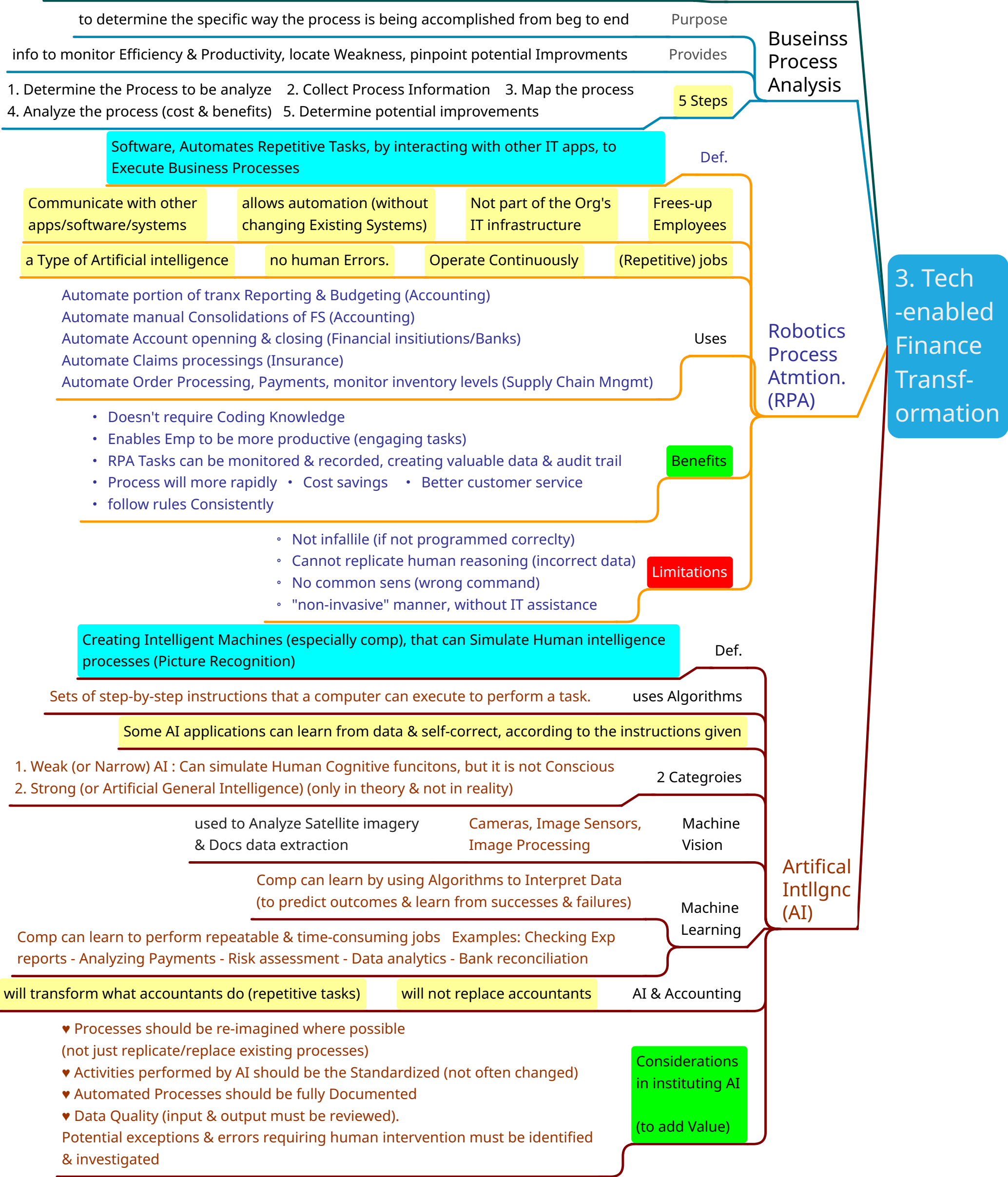
➤ Investigation & Feasibility Study of Alternative Solutions (options)

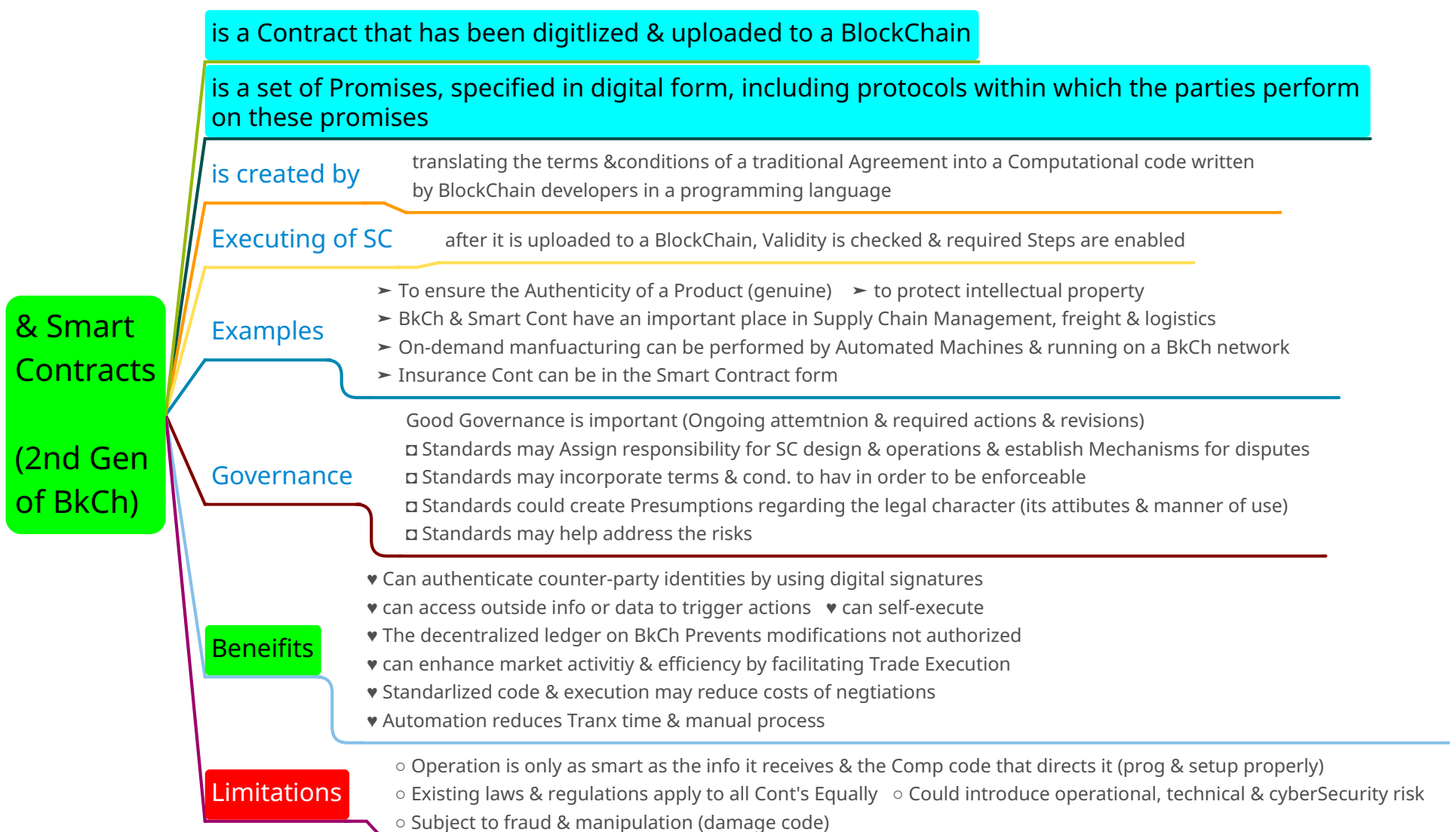
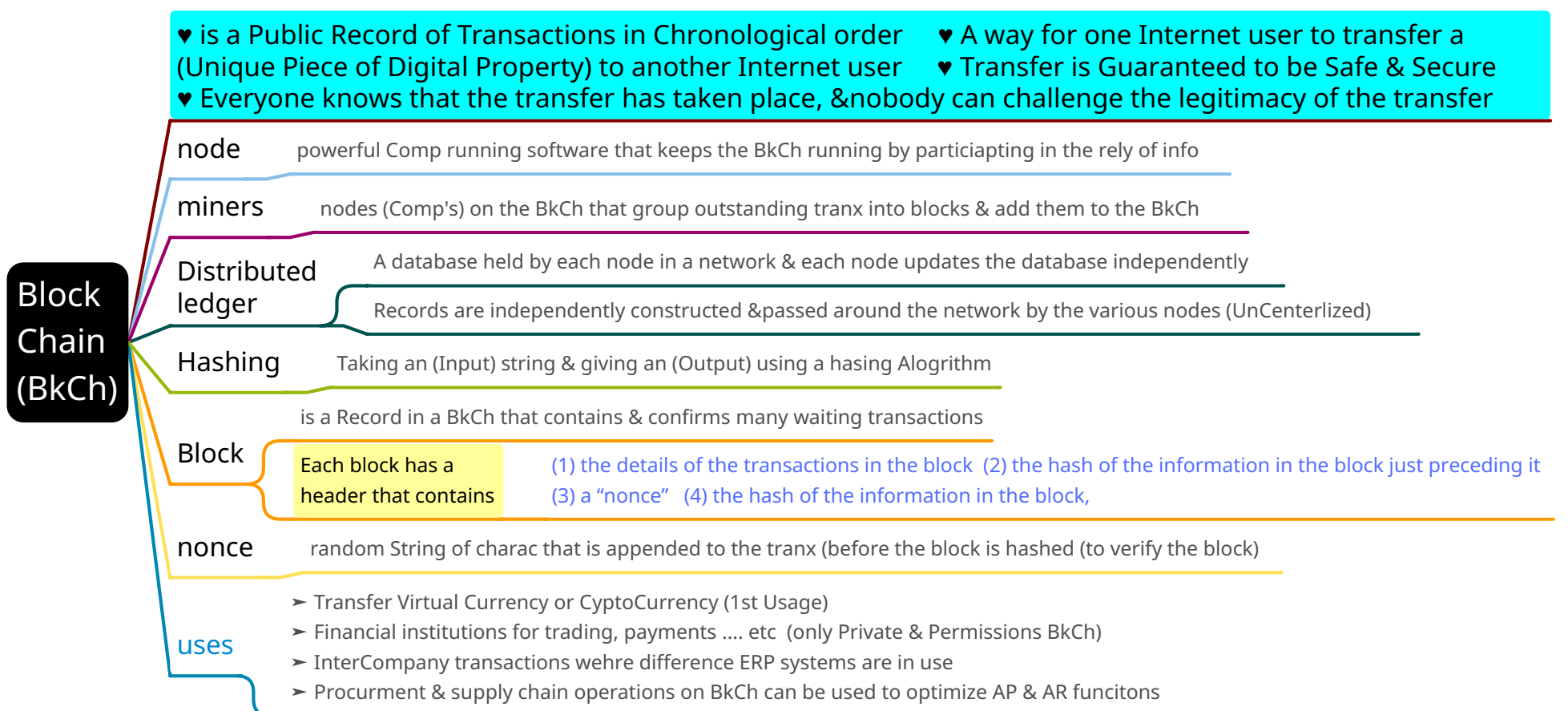
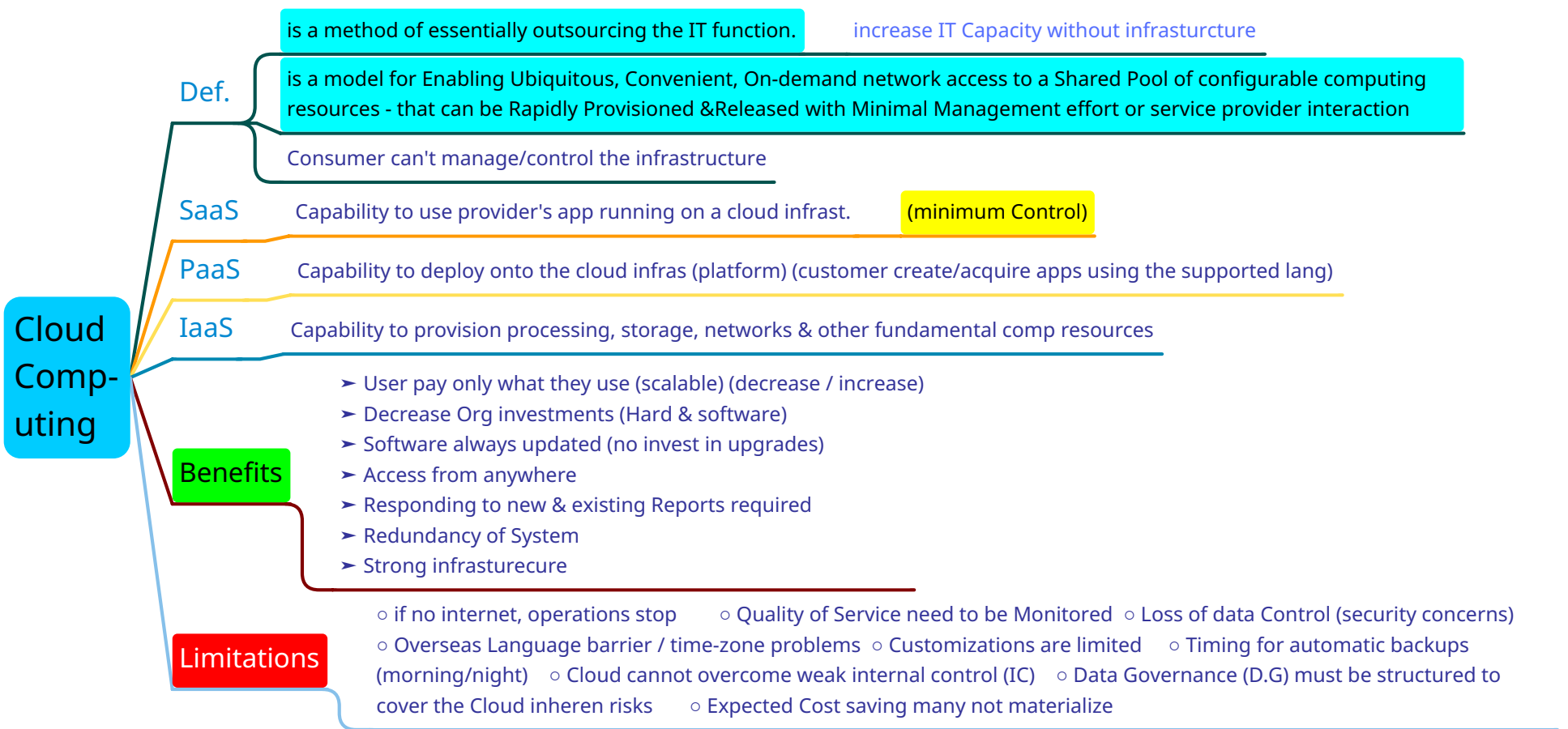
➤ Conceptual desing (initial)

➤ System implementation & Conversion

➤ Physical design (workflow, controls..)

➤ Operations & Maintenance
- System Development life cycle





Process of Gathering & Analysing data - to produce Meaningful Information - can be used to aid in Decisions

Def.

1. DeScriptive (what happened)
2. Diagnostic ( why )
3. PreDixtive (what's likely to happen)
4. PreScriptive (what need to happen)

4 Types

Combination of (Architectures & Analytical Tools, Data Base, Apps) - Enable access to Data & Prediction

Data (raw /facts) - Info (Data Processed & Analyzed) - Knowledge (understanding)  
- Insight (deep & clear) - Decisions (recommendations) - Action (implemented)

Data to Action

1. A data warehouse (DW) (the source data)
2. Business analytics: (mine, manipulate, & analyze the data)
3. A business performance management (BPM): monitor/analyze performance.
4. A user interface: dashboard.

4 Components

Vast DB, Too large to be analyzed using standard software, require New Technologies (Data Analytics)

1. Structured data
2. Unstructured data (ex: emails)
3. Semi-Structured data

3 Categories

1. Volume (amount)
2. Velocity (flow rate) (speed)
3. Variety (forms)
4. Veracity (accuracy)
5. Variability
6. Value

4V's attributes

Big Data

Business intelligence

Data & Data Science are Complmenetary Assets

is a field of study & analysis that uses Algorithms & processes to extract (Hidden knowledge) & insights from data

Data Science

to use both Structured & Unstructured data to extract info that can be used to develop knowledge & insights for forecasting & strategic decision making

Objective

Use of Statistical Techniques to search large Data to Extract & Analyze data - in order to Discover Previously Unknown useful Patterns, Trends & Relationships - used to make Decisions & Prediction

Data Mining : is an Iterative process / is a Science (defined steps) / is an Art

3 Characteristics

uses Specialized Computational methods derived from the fields of Statistics, Machine learning, & Artificial intelligence

in Data mining, the Context of Words & info must be Considered

Context

Ability to predict /assign a label to a "new" observation based on a model built from past experience

Generalization

Data Mining invovles Generalization of Patterns from a Data Set

Classification (who) / Prediction (amount) / Association rules (related items) / Online recommendation systems / Data reduction (groups) / Clustering (groups) / Dimension reduction / Data Exploration / Data Visualization

use in Predictive Analysis

used in classification and prediction.

Supervised

when there is no outcome variable to predict or classify. Association rules, dimension reduction, & clustering are unsupervised learning methods

UnSupervised

Supervised /UnSupervised Learning

are systems that can recognize patterns in Data - & use the patterns to make predictions using New Data

Data mining

Neural networks derive their knowledge from their own data by sifting through the data &recognizing patterns

Neural Network

Results of Neural Networks Predictions (output) becomes (input) for the next iteration model

Stocks for investment / Bankruptcy predictions / Detecting Fraud / Identifying digital image / Self-driving vehicles

Uses

a weakness of neural networks & occurs when the model fits the training data perfectly, but does not generalize well & does not do a good job of predicting

Overfitting Data

Underfitting happens - the model is too simple - it will not be flexible enough in learning from the data

Poor Data quality / Data in multiple locations / Biases are amplified in evaluating data / Analyzed data displays correlations, not prove Causation / Ethical issues, such as privacy / Data Security / Growing volume of unstrctured data

Challenges

1. Understand the purpose of the project
2. Select the dataset to be used
3. Explore, clean & preprocess the data.
4. Reduce the data dimension if needed
5. Determine the data mining task
6. Partition the data
7. Select the data mining techniques to use
8. Use algorithms to perform the task
9. Interpret the results of the algorithm
10. Deploy the model

10 Steps

used to store data from all sources and is a good way to store data when unstructured data is included

Data Lake

aims to provide better understanding of data & predictions by showing the data in a visual way than simply in a table

Def.

Data visualization

Scatter plot / Dot plot / Bar chart / Pie chart / Line chart / Bubble chart / Histogram / Boxplot

Common

4. Data Analytics

# Analytic tools

## Regression Analysis

Measure the Extent to which an Effect has Historically been the result of a specific Cause

If relationship between Cause & Effect is sufficiently Strong, regression analysis using historical data can be used for Decisions & Predictions

Time series (patterns)      Trend / Cyclical / Seasonal / Irregular

Simple linear regression       $\hat{y} = a + bx$

Time Series can be (Descriptive) or (Predictive)

line of best fit

A formalization, one would fit a trend line through the graphed data just by looking at it

use a ruler & move it up & down, changing the angle, until it appears the differences between the points & the line drawn with the straight edge have been minimized

## Multiple regression analysis

more than one independent V is known to impact a dependent V & Each independent Variable can be expressed numerically       $\hat{y} = b_2X_2 + b_4X_4 + \dots$

## Correlation Analysis

(4 statistics calcultns)

1. Correlation coefficient (R)

num measure that expresses both the Direction (positive /or negative) & the Strength of the linear association between 2 variables (R is between -1 & +1)

2. standard Error

Rep the average distance that the observed values fall from the regression line

how wrong the regression model is on average, using units of the dependent variable (y)       $(\hat{y} = a + bx + e)$

3. Coefficient of determination ( $R^2$ )

the % of the total variation in the dependent variable (y) that can be explained by variations in the independent variable (x), as depicted by the regression line. ((Reliability)) ( $R^2$  is between 0 and 1))

4. T-statistics

measures the degree to which the independent variable has a valid (Long-term relationship) with the dependent variable

for the independent variable used in a simple regression analysis      T should be > 2

## Goodness of fit

A measure of how close the (Actual values used) in a (Statistical model) are to the expected (predicted) values in the model

## Confidence interval

the Range we expect a Certain % of the items from a sample to fall in. it's used in Regression Analysis to describe the Uncertainty amount caused by the (Sample) method used ((mostly Confidence interval is 95%))

## Limitations of Reg Analysis

- Require Historical data
- use of Historical data is Questionable - if still relevant & useful?
- Results depends on choice of the indpdnt V
- Statstical relationships maybe valid for 1 sample

## Sensitive Analysis

Sensitivity Analysis known as ("What-if")

determine how much prediction will change if (One) input is changed

used to determine which input parameter is most important for achieving accurate predictions

Monte Carlo Simulation analysis

determine how much Prediction will change if Multiple variables changed

used to develop an expected value when the situation is complex & the values cannot be expected to behave predictably

Benefits of Sens & Simu analysis

✓ Idetnify most Critical Variables    ✓ Simulate is flexible (wide variety)    ✓ Both are easily understood    ✓ Many sim models can be impl without Speical Softwre

Limitations

Results can be ambiguous when inputs used are themselves predictions • Variables to be interrelated • Simu is not an Optimization technique • No Guarantee for best Performance • Only as accurate as model used • Noway to Test the accuracy

## Benefits of Data Analysis

- ✓ Process of Data Cleaning (detect Errors, Duplicats, Missing Values)
- ✓ Correct results lead to imporve Sales & Profits      ✓ Reduce Fraud      ✓ Improving Forecasting
- ✓ Easy-to-use tools are available (data Science users are able to access data & generate Reports)

## Limitates of Data Analysis

- Big Data is used to find Correlations (May not be the Causes to each other)
- if Wrong Questions are asked to find Correlation, Insights will be meaningless
- Failure to take all relevant Variables can lead to inaccurate predictions
- Data braches are a risk of using Big Data    • Customer Privace issues & Risk of misuse
- Cost of Data Analytics tools & Training    • Selction of the Right Data Analytics is Difficult