

ERP IN GAME THEORY

P R E P A R E D B Y : L U I S M E I N G

OBJECTIVES:



01

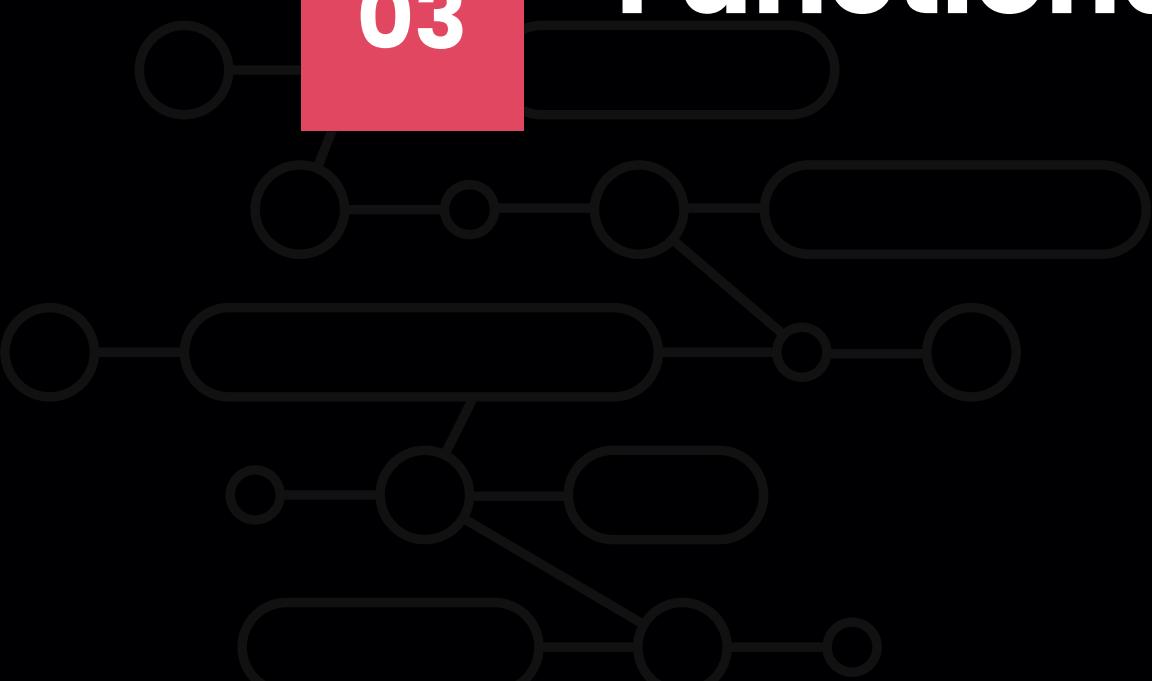
Definition

02

Analytics

03

Functional Areas and Business Processes





Game Theory

- is the study of the ways in which interacting choices of agents produce outcomes with respect to the preferences of those agents, where the outcomes in question might have been intended by none of the agents

Game Theory

- is the study of the consequences of your actions
- introduced von Neumann & Morgenstern (1944)

1.1 Definition

Game



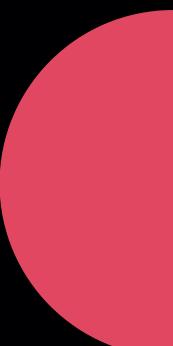
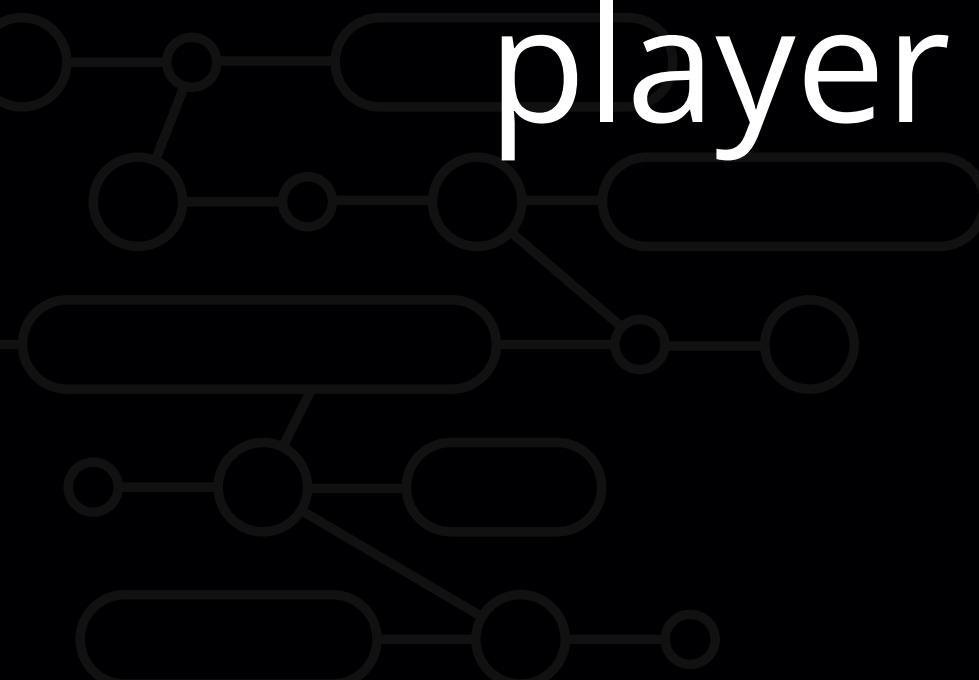
- All situations in which at least one agent can only act to maximize their utility through anticipating the responses to his actions by one or more other agents

1.1 Definition

Game



- where a player tries to predict the effects of their actions against or with another player



1.1 Definition

Player

- Agents involved in games



The Prisoner's Dilemma

- Suppose that the police have arrested two people whom they know have committed an armed robbery together.

Unfortunately, they lack enough admissible evidence to get a jury to convict.



The Prisoner's Dilemma

- They do, however, have enough evidence to send each prisoner away for two years for theft of the getaway car.
- The chief inspector now makes the following offer to each prisoner:

The Prisoner's Dilemma

- If you will confess to the robbery, implicating your partner, and they do not also confess, then you'll go free and they'll get ten years. If you both confess, you'll each get 5 years. If neither of you confess, then you'll each get two years for the auto theft.

1.2 Game Theory Examples

The Prisoner's Dilemma

		Player 2	
		Confess	Keep Quiet
Player 1		Confess	2, 2 years
Player 1	Confess	2, 2 years	0, 10 years
	Keep Quiet	10, 0 years	5, 5 years

1.2 Game Theory Examples

DOTA Medusa Exploit



Medusa
Gorgon

Strength



14 + 1.85 20 + 2.5 19 + 2.25

Agility



Intelligence



ADVANCED STATISTICS

Affiliation: Neutral

Damage: 44 - 50

Armor: 1.9

Movespeed: 300

Attack Range: 600

Attack Animation: 0.5 / 0.6

Casting Animation: 0.4 / 0.5

Base Attack Time: 1.7

Missile Speed: 1200

Sight Range: 1800 / 800

Skilltree:



Carry:



build 2:

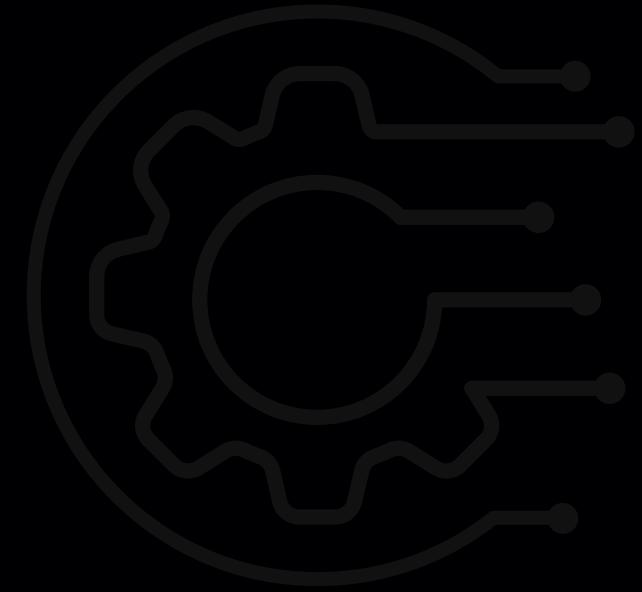
1.2 Game Theory Examples

Garry Kasparov vs. Deep Blue



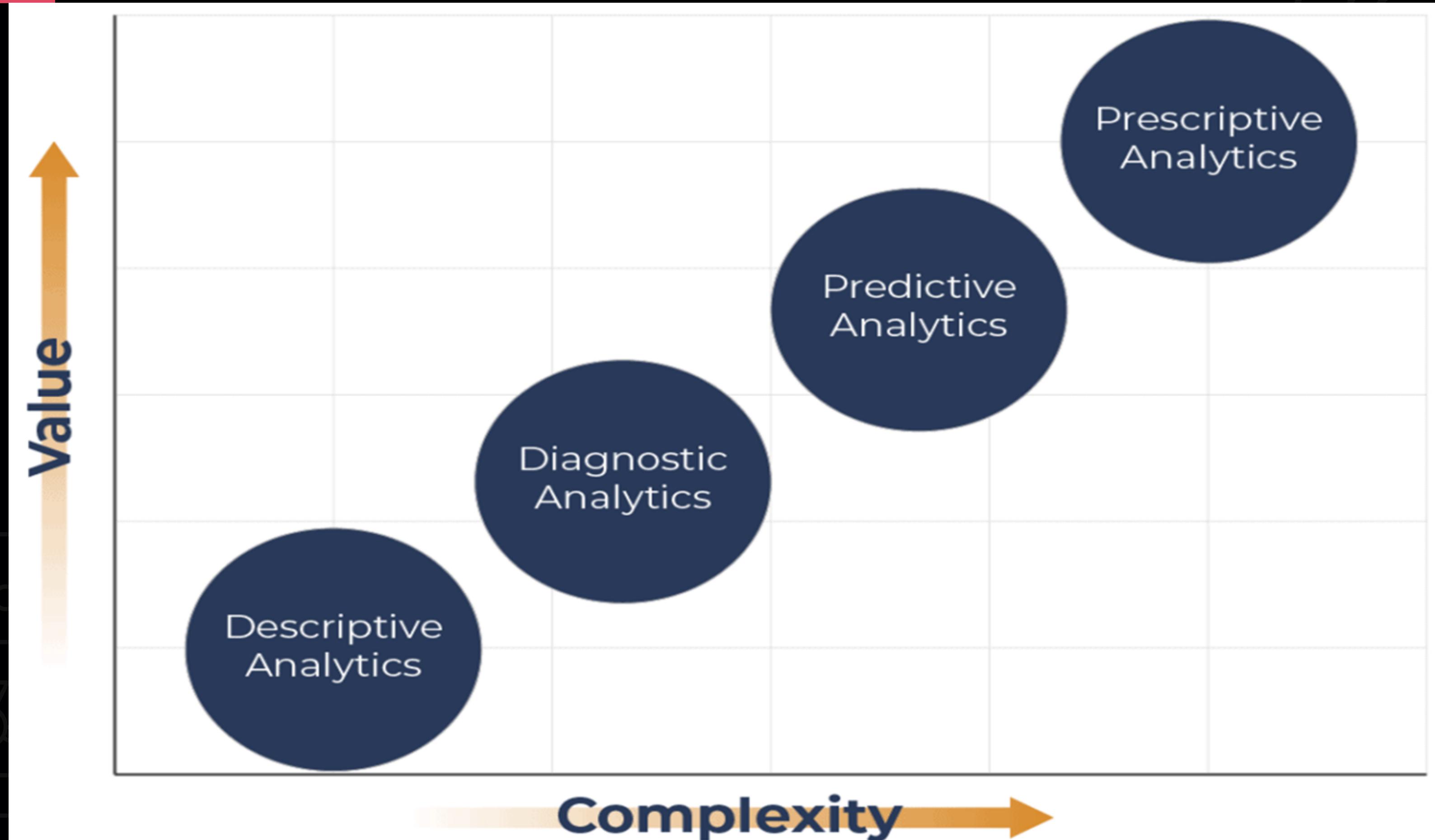
2.1 Analytics

Analytics



- is a field of computer science that uses math, statistics, and machine learning to find meaningful patterns in data

2.2 Types Analytics



Descriptive Analytics

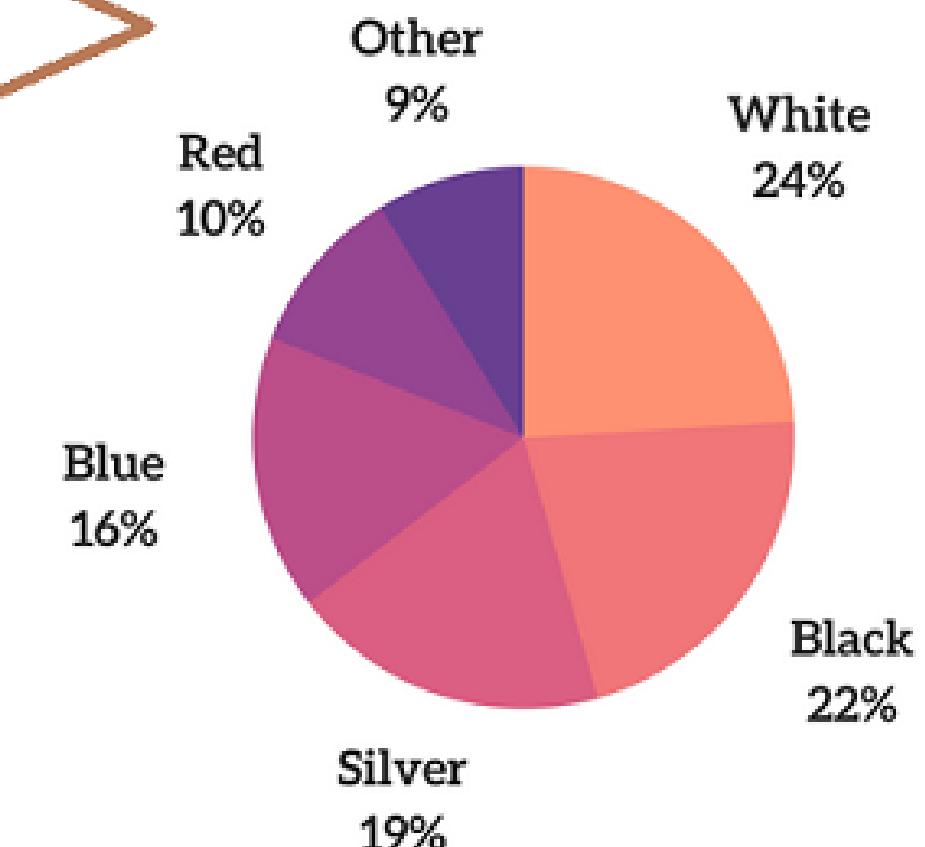
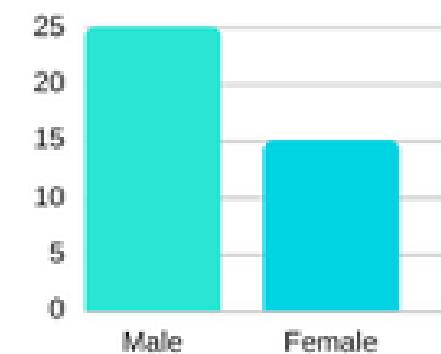
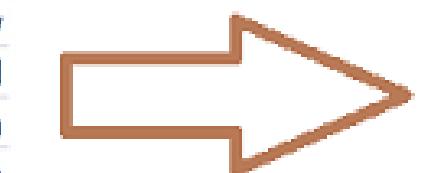
- What happened
- Presents its findings using reports, pivot tables, and visualizations like :
 - histograms,
 - line graphs,
 - pie charts,
 - and box and whisker plots

2.2 Types Analytics

Descriptive Analytics

	A	B	C	D	
1	Respondent Number	Age	Gender	Favorite Car Color	
2		1	22	M	White
3		2	37	F	Silver
4		3	45	F	Black
5		4	62	F	Gray
6		5	28	M	Red
7		6	45	M	Green
8		7	88	F	Brown
9		8	61	M	White
10		9	95	M	Black
11		10	27	M	White
12		11	39	F	Green
13		12	43	M	Brown
14		13	55	F	Black
15		14	59	F	White

RAW DATA



Descriptive Statistics

Diagnostic Analytics

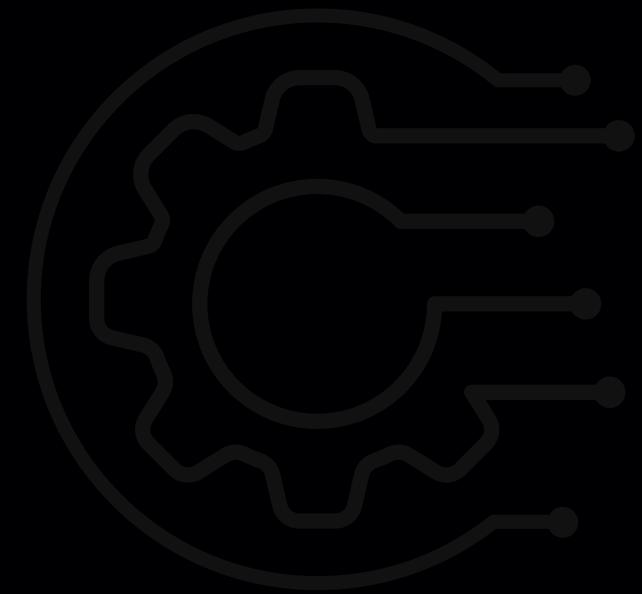
- Why it did happen
- Focus on root cause and effect (root cause analysis)
- It aims to identify and explain anomalies and outliers

2.2 Types Analytics

Diagnostic Analytics



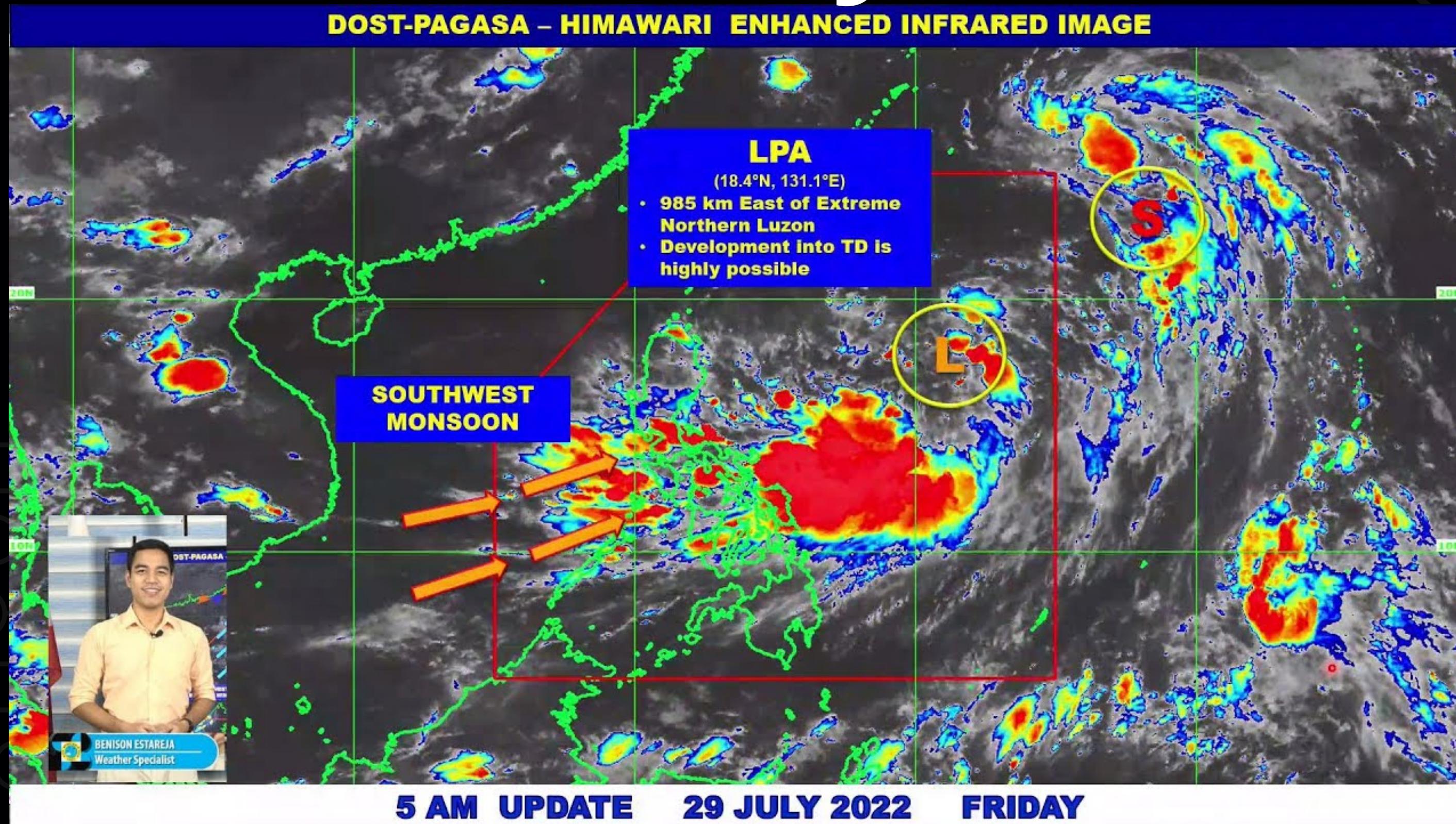
Predictive Analytics



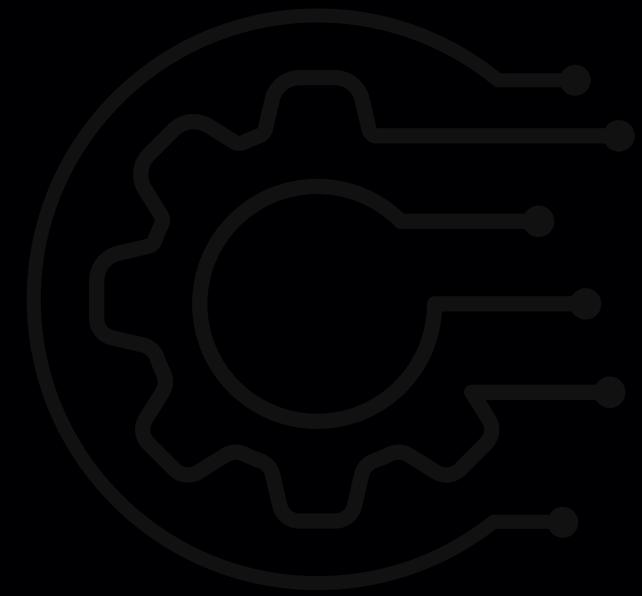
- What might happen in the future
- Uses deep learning, machine learning algorithm to find patterns

2.2 Types Analytics

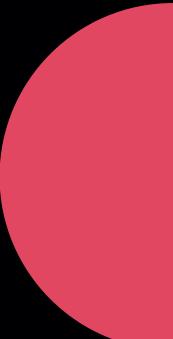
Predictive Analytics



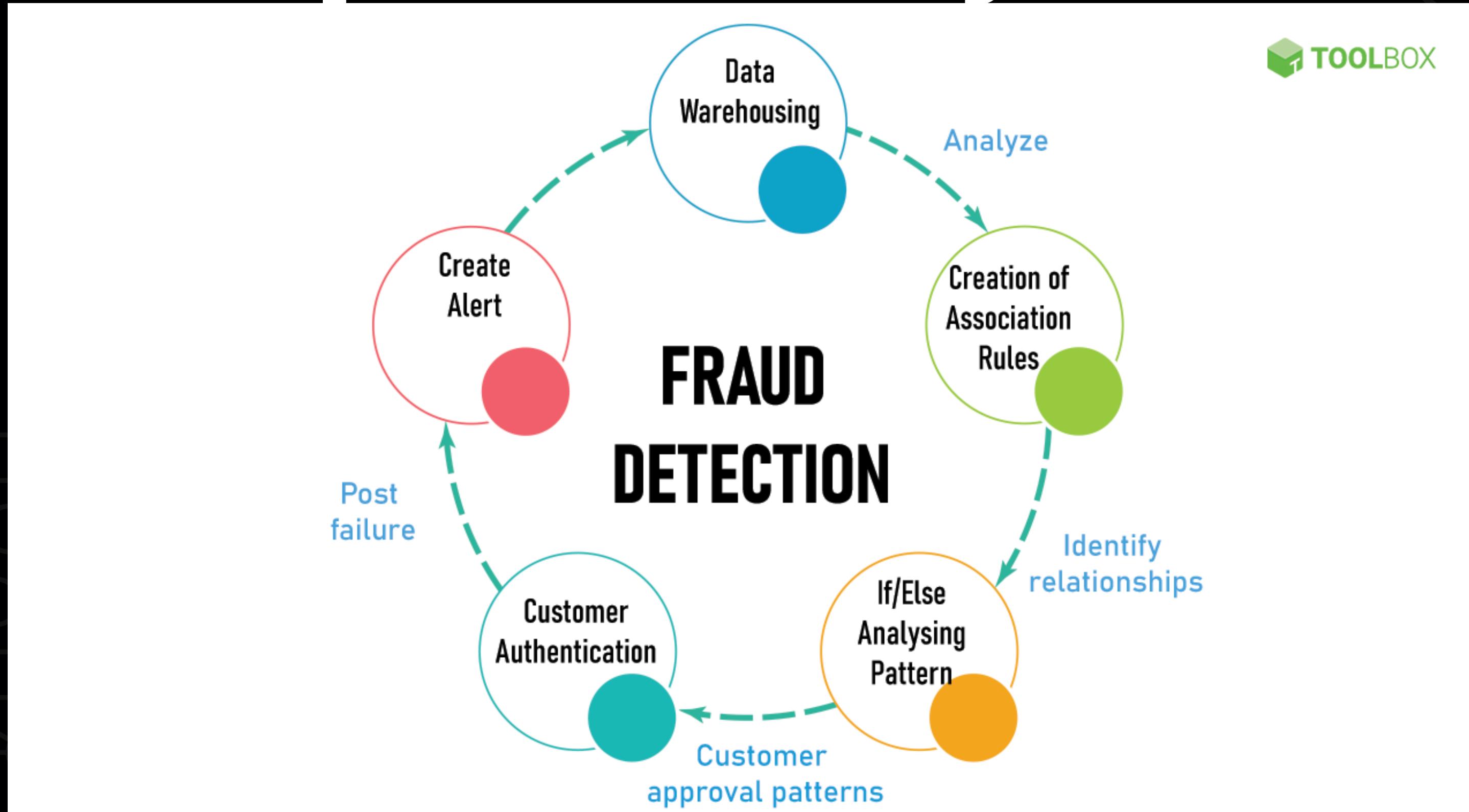
Prescriptive Analytics



- What should we do next?
- “the future of data analytics”



Prescriptive Analytics



2.1 Analytics

Business Analytics



- is analytics applied to business data



Short-Term Data Collection

- barely allows researchers to develop a deep understanding of participants' characteristics, experiences, and beliefs

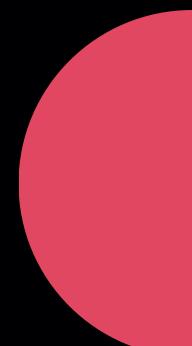
2.1 Analytics

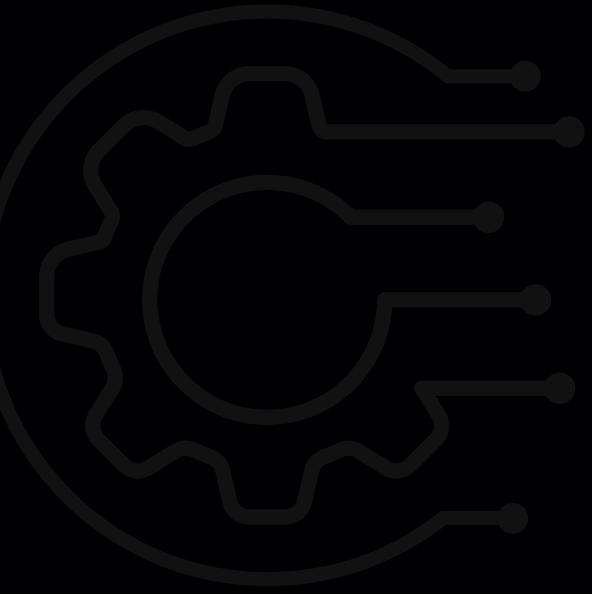
Long-Term Data Collection

- dropout rate is high

2.1 Analytics

	LONG-TERM	SHORT-TERM
DURATION	lasts several months up to a few years	1 week to 3 months
NO. OF RESPONDENTS	hundreds to thousands of participants	less than 50
OBJECTIVES	multiple research objectives	one main objective to accomplish
FREQUENCY	longer contribution intervals as scheduled by the researcher	frequent contribution in short timeframe
PROS	exploring a wider range of interconnected topics in greater detail	easy to manage, collect, and verify data bona fides from a smaller sample
CONS	dropout rate is high due to burnout	barely allows researchers to develop a deep understanding of participants
BUDGET	Expensive due to length of study and amount of respondents	Lower-cost, based on completion of study or number of contributions





Marketing and Sales

Inputs:

- Customer data
- Order data
- Sales trend data
- Per-unit cost
- Company travel expense policy

3.1 Functional Areas and Business Processes

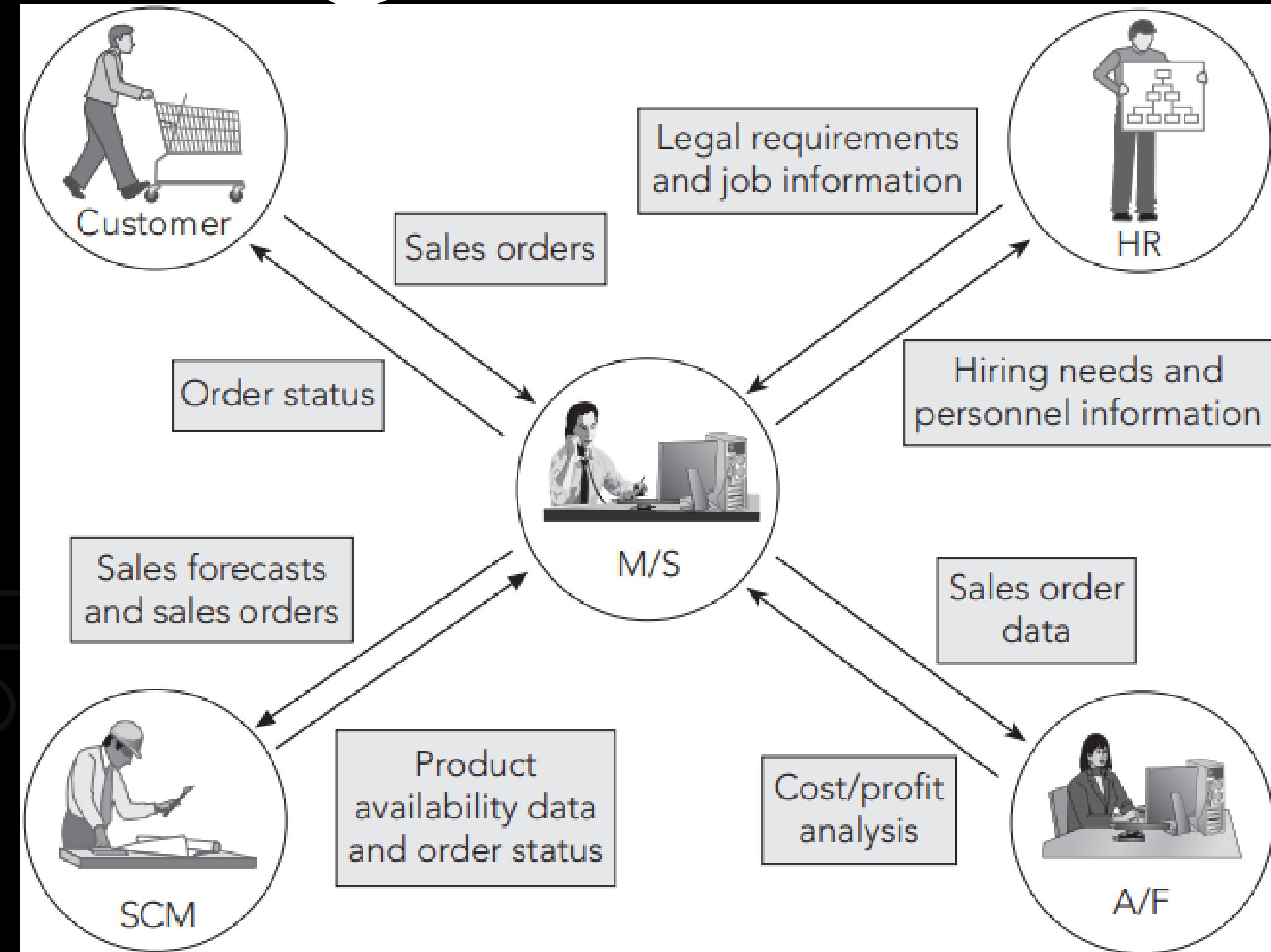
Marketing and Sales

Outputs:

- Sales strategies
- Product pricing
- Employment needs

3.1 Functional Areas and Business Processes

Marketing and Sales



Supply Chain Management

Inputs:

- Product sales data
- Production plans
- Inventory levels
- Layoff and recall company policy

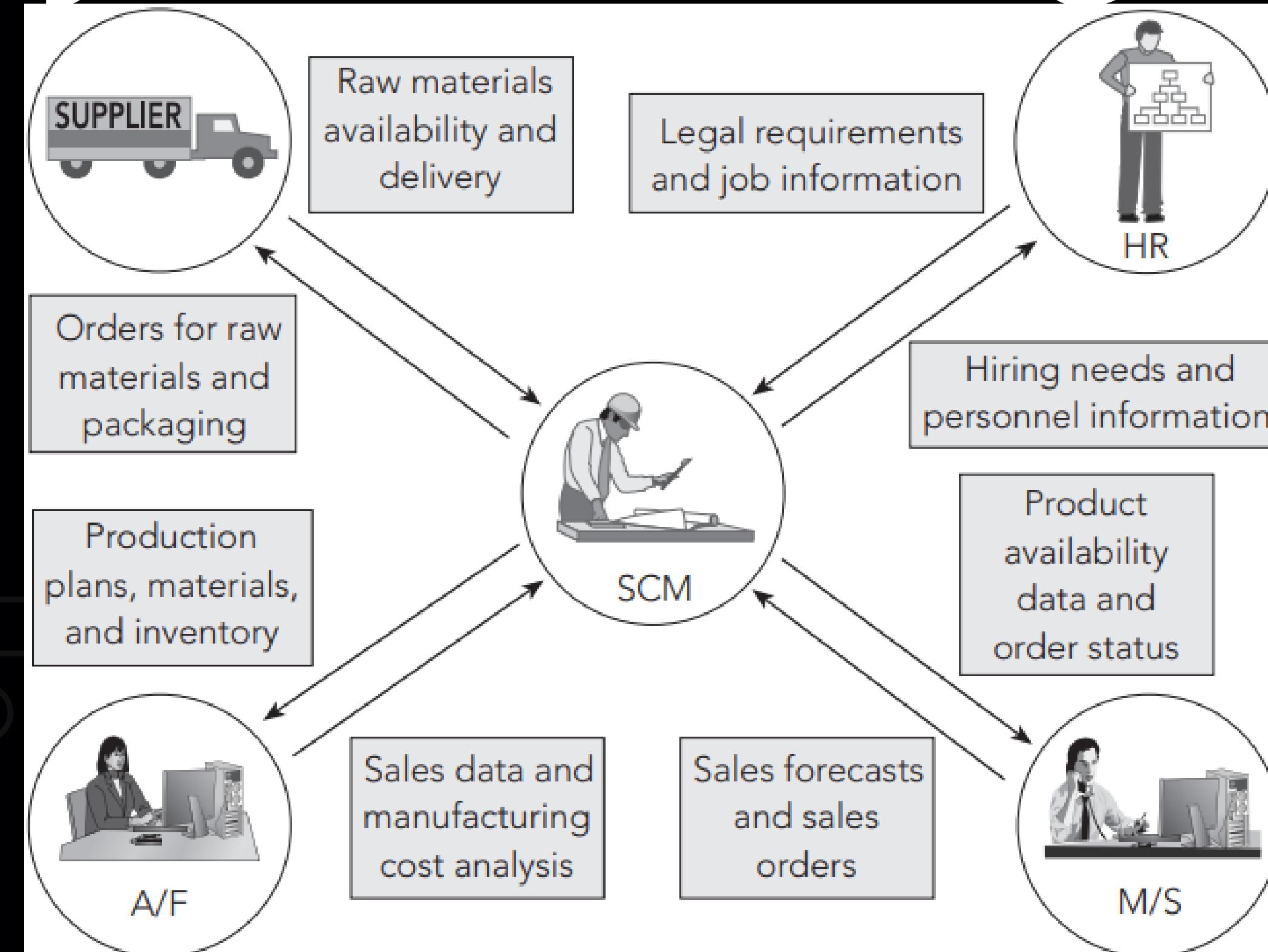
Supply Chain Management

Outputs:

- Raw material orders
- Packaging orders
- Resource expenditure data
- Production and inventory reports
- Hiring information

3.1 Functional Areas and Business Processes

Supply Chain Management



Accounting and Finance

Inputs:

- Payments from customers
- Accounts receivable data
- Accounts payable data
- Sales data
- Production and inventory data
- Payroll and expense data

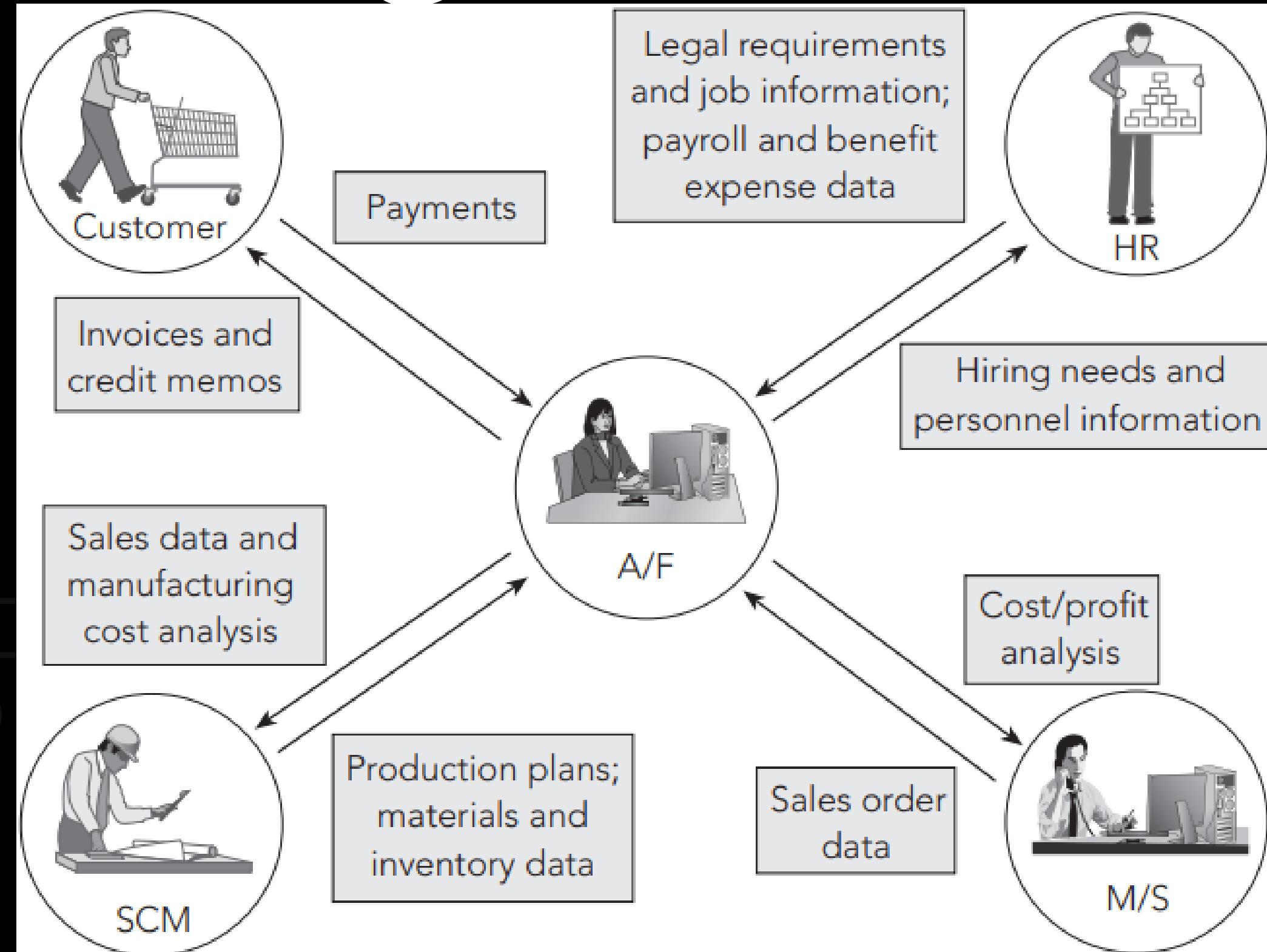
Accounting and Finance

Outputs:

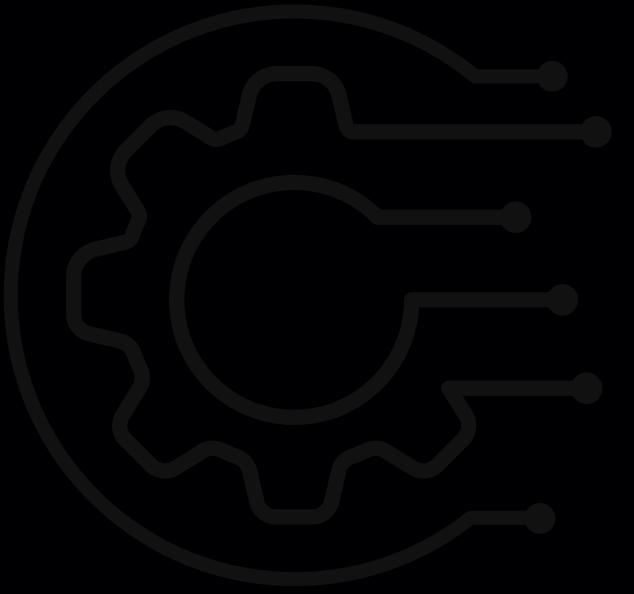
- Payments to suppliers
- Financial reports
- Customer credit data

3.1 Functional Areas and Business Processes

Accounting and Finance

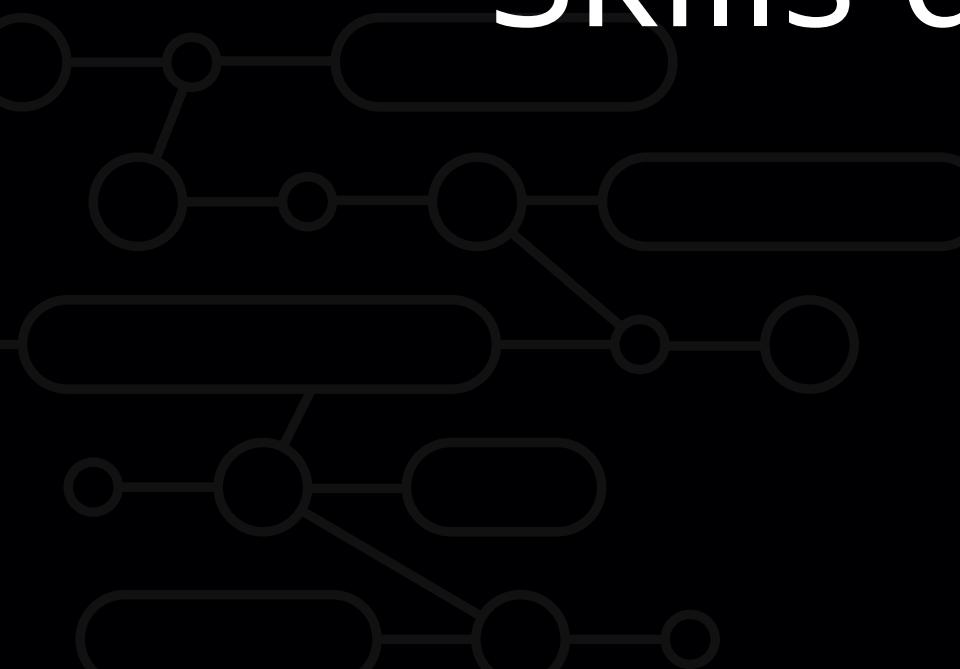


Human Resources



Inputs:

- Personnel forecasts
- Skills data



3.1 Functional Areas and Business Processes

Human Resources



Outputs:

- Regulation compliance
- Employee training and certification
- Skills database
- Employee evaluation and compensation

3.1 Functional Areas and Business Processes

Human Resources

