# Fundamentos de la Informática I
# 2022

PARAGUAYO
ALEMANA

17/Agosto/2022

# Decision Support Systems
## (Parte 2)

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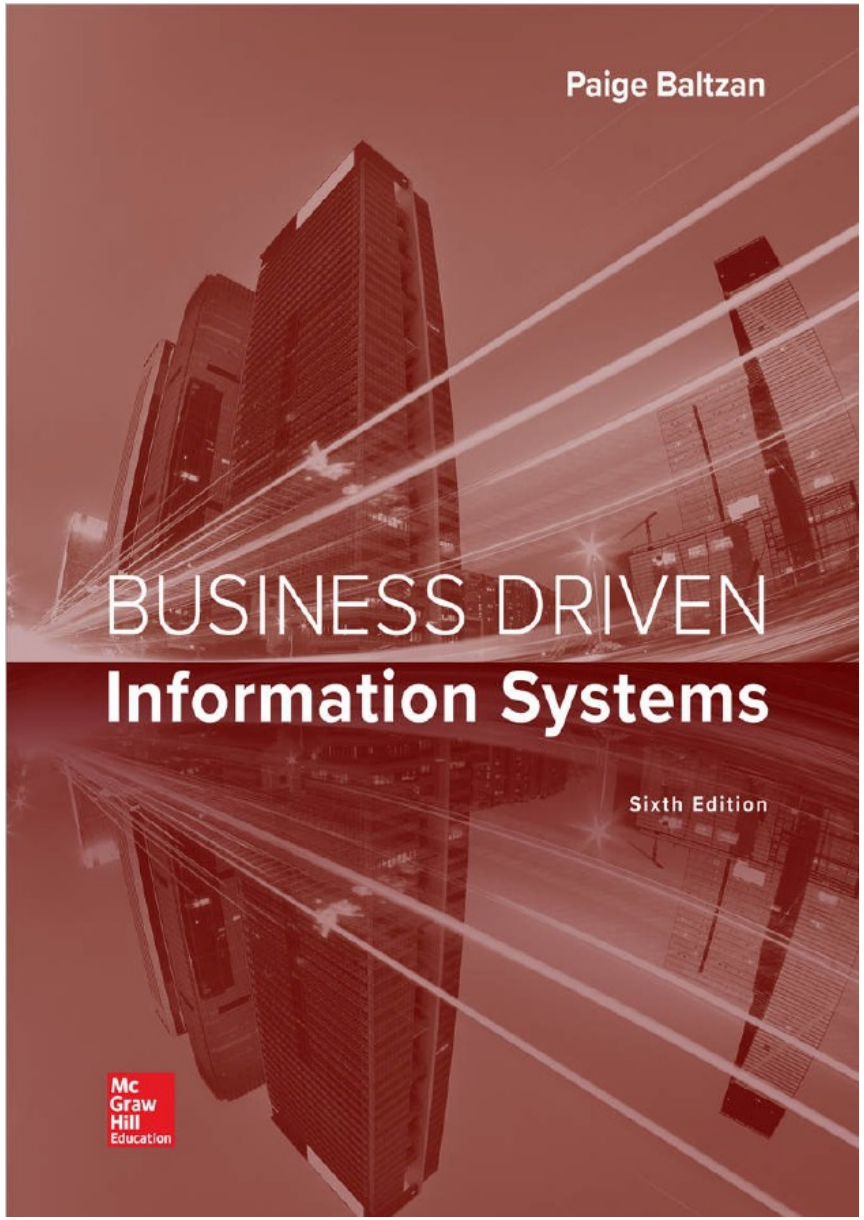
# CHAPTER TWO

# DECISIONS AND PROCESSES

# VALUE DRIVEN BUSINESS



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# LEARNING OUTCOMES

1. Explain the importance of decision making for managers at each of the three primary organization levels along with the associated decision characteristics
2. Define Critical Success Factors (CSFs) and Key Performance Indicators (KPIs), and explain how managers use them to measure the success of MIS projects
3. Classify the different Operational, Managerial, and Strategic support systems, and explain how managers can use them to make decisions & gain competitive advantage
4. Describe Artificial Intelligence and identify its five main types.

# USING MIS TO MAKE BUSINESS DECISIONS

- **Model** – A simplified representation or abstraction of reality
- Models help managers to
  - Calculate risks
  - Understand uncertainty
  - Change variables
  - Manipulate time to make decisions

MIS support systems rely on models for computational and analytical routines that mathematically express relationships among variables.

Q: ¿Con que tipo de herramientas de IT puedes hacer modelos para la toma de decisions de negocios? ¿Puedes nombrar alguna?

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# USING MIS TO MAKE BUSINESS DECISIONS

Decision-making and problem-solving occur at each level in an organization

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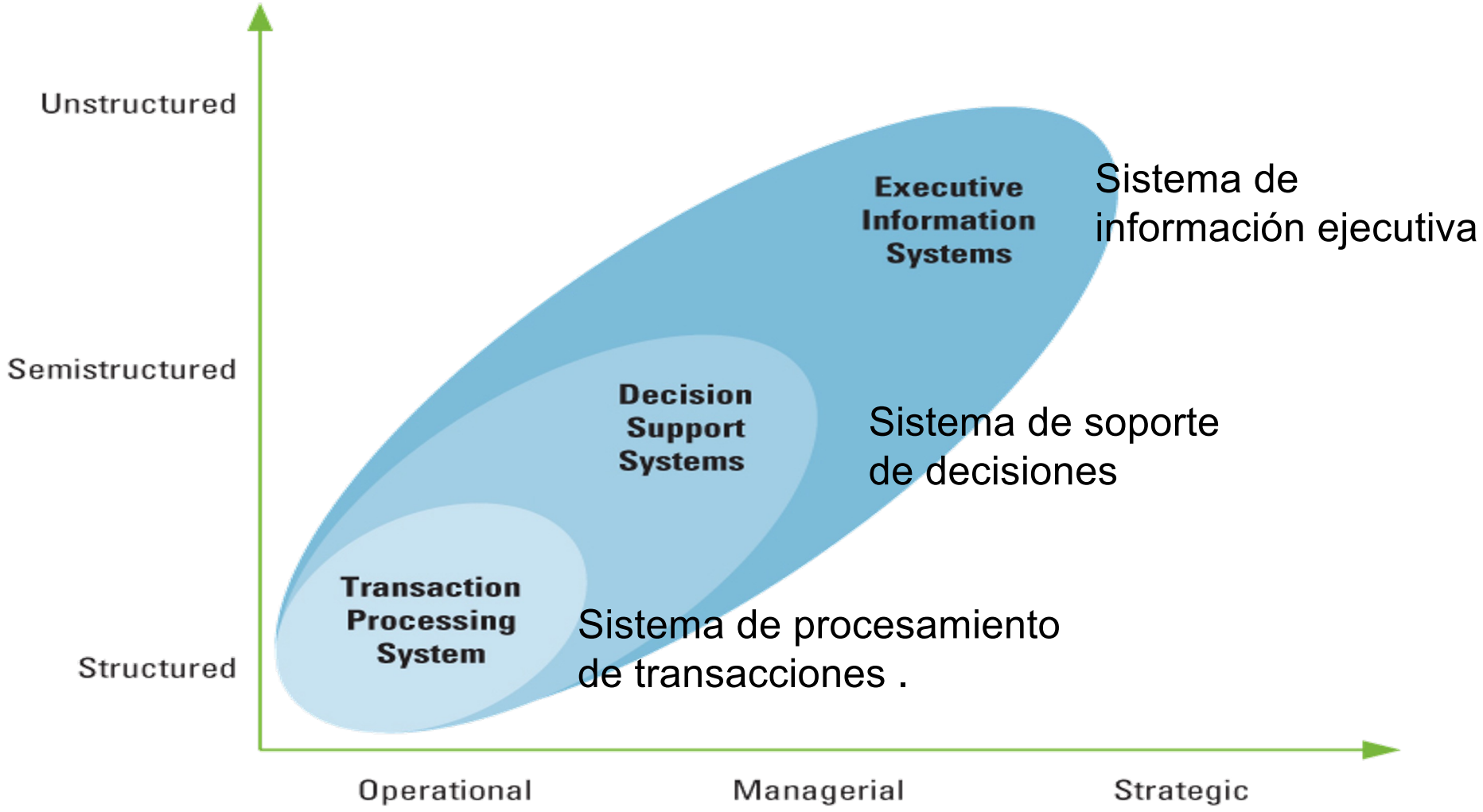
# USING MIS TO MAKE BUSINESS DECISIONS




**Three primary types of Decision Making MIS Systems**

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# a) Operational Support Systems

- **Transaction Processing System (TPS)** – Basic business system that serves the operational level and assists in making structured decisions
- **Online Transaction Processing (OLTP)** **-** Capturing of transaction and event information using technology to process, store, and update
- **Source document** – The original transaction record

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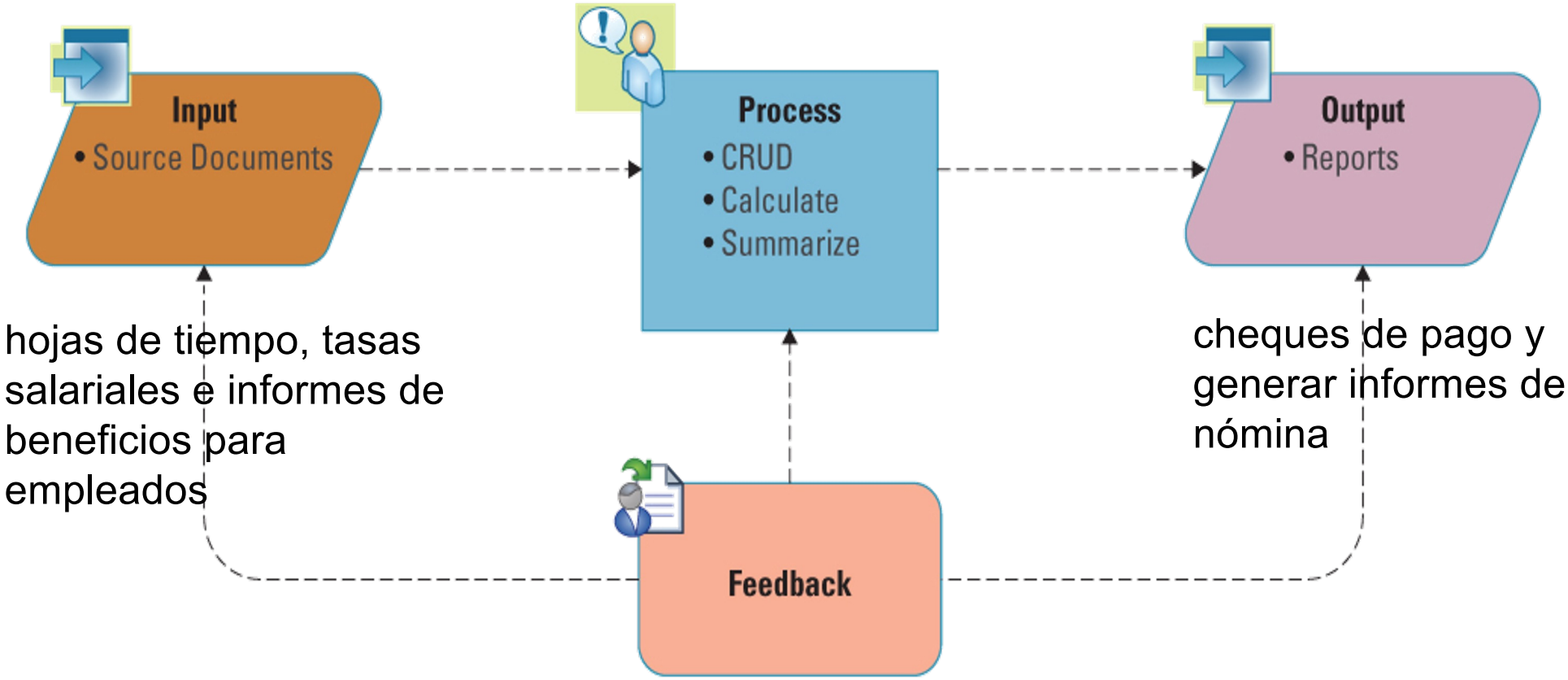
# Operational Support Systems




## Systems Thinking View of a TPS

CRUD: Create, read, update, and delete

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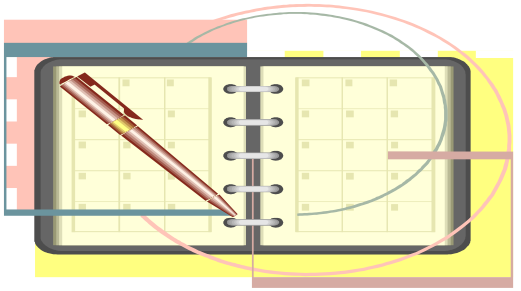
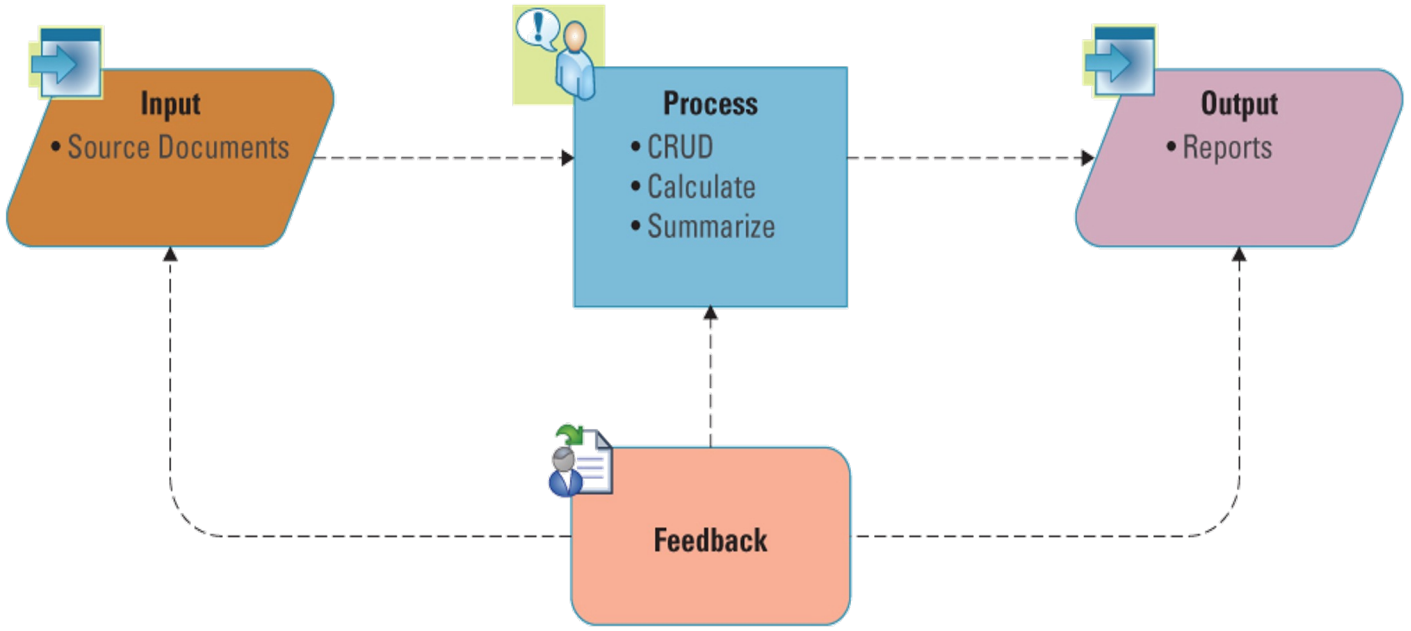
# Operational Support Systems

Q: ¿Para qué se usa un *Transaction Processing System* (TPS) en un Supermercado?

Q: ¿Qué decisiones podrían tomarse?






CRUD: Create, read, update, and delete

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# b) Managerial Support Systems

- **Online Analytical Processing (OLAP) –** Manipulation of information to create business intelligence in support of strategic decision making

*tendencias, ventas, estadísticas de productos y proyecciones de crecimiento futuro*

- **Decision Support System (DSS) –** Models information to support managers and business professionals during the decision-making process

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# Managerial Support Systems

DSS analysis techniques:

1. What-if analysis: impact of a change in an assumption on the proposed solution.
2. Sensitivity analysis: impact of changing one variable in other variables.
3. Goal-seeking analysis: find the inputs necessary to achieve a goal as a desired level of output.
4. Optimization analysis: finds the optimum value for a target variable by repeatedly changing other variables, subject to specified constraints.

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# Managerial Support Systems

| Tipo de modelación analítica | Actividades y ejemplos |
|---|---|
| **Análisis de escenarios** | Observar cómo los cambios realizados a variables seleccionadas afectan a otras variables.<br>*Ejemplo:* ¿Qué pasaría si reducimos la publicidad en un 10 por ciento? ¿Qué sucedería con las ventas? |
| **Análisis de sensibilidad** | Observar cómo los cambios repetidos a una sola variable afectan a otras variables.<br>*Ejemplo:* Reduzcamos los gastos de publicidad en $100 de manera repetida para que observemos su relación con las ventas. |
| **Análisis de búsqueda de objetivos** | Realizar cambios repetidos a variables seleccionadas hasta que una variable elegida alcance un valor meta.<br>*Ejemplo:* Probemos con aumentar la publicidad hasta que las ventas lleguen a un millón de dólares. |
| **Análisis de optimación** | Encontrar un valor óptimo para variables seleccionadas, dadas ciertas restricciones.<br>*Ejemplo:* ¿Cuál es la mejor cantidad de publicidad que debemos tener, dado nuestro presupuesto y selección de medios de comunicación? |

Actividades y ejemplos de los principales tipos de modelación analítica.

Fuente: Sistemas de Información Gerencial – O'brien & Marakas - MsGrawHill

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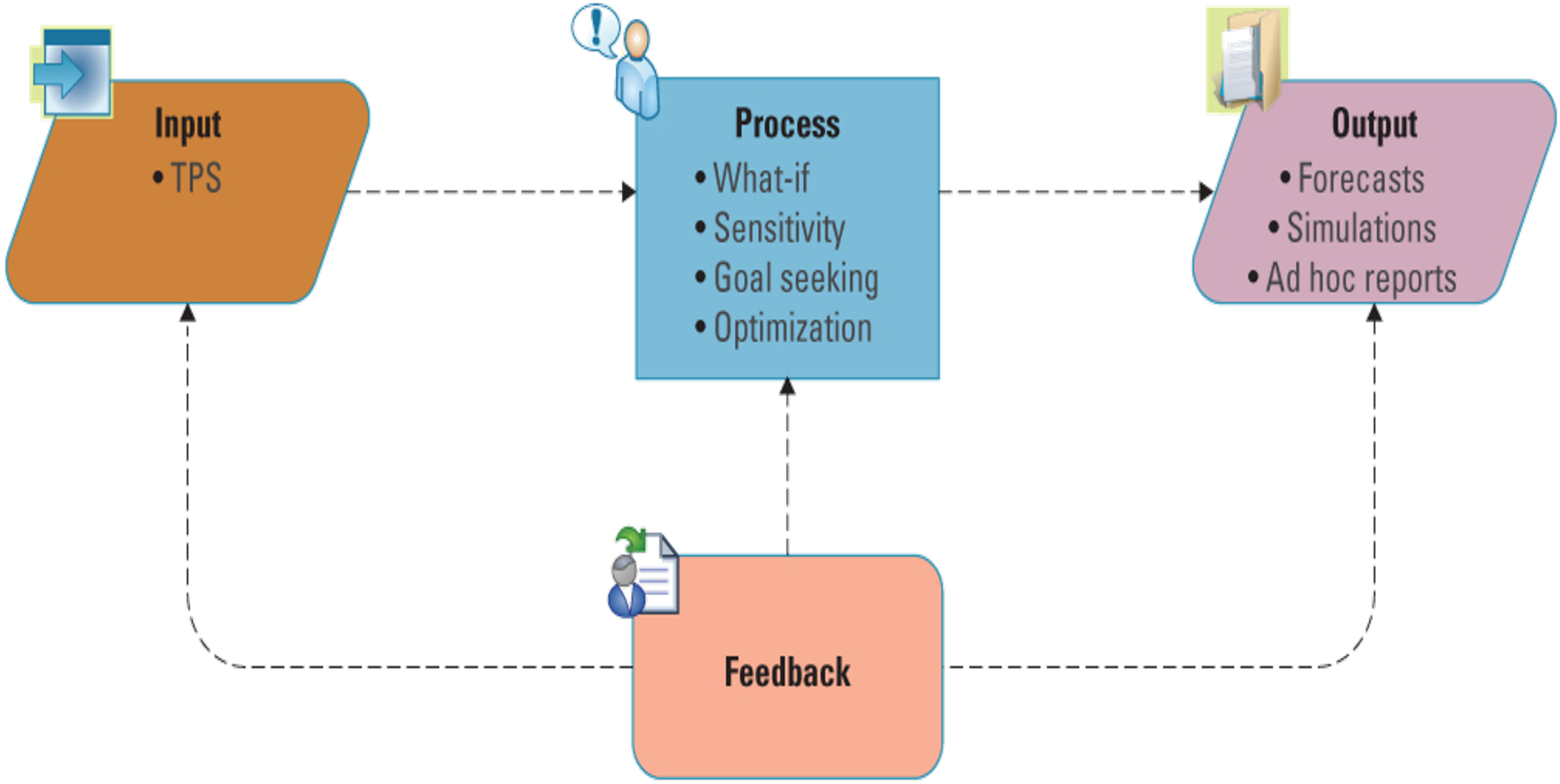
# Managerial Support Systems




## Systems Thinking View of a DSS

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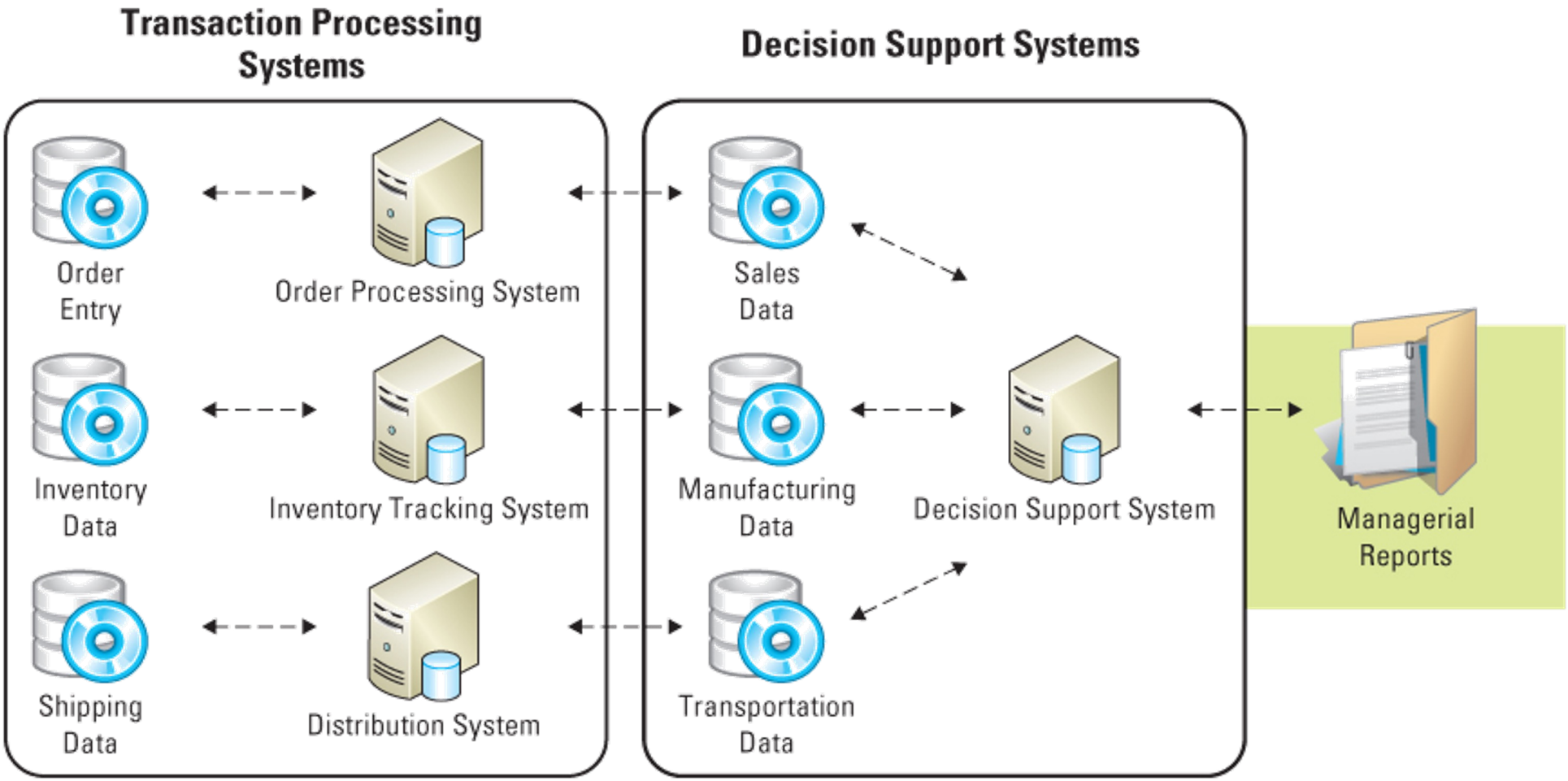
# Managerial Support Systems




## Interaction Between a TPS and DSS

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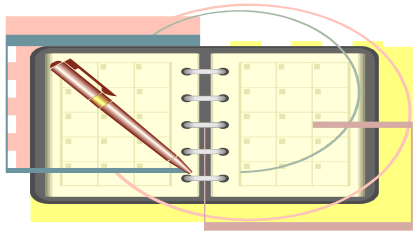
# Managerial Support Systems



Q: ¿Para qué se usa un *Decision Support System (DSS)* en un Supermercado?

Q: ¿Qué decisiones podrían tomarse?

Q: Busquemos ejemplos de los tipos de análisis para el caso del Supermercado

1. What-if analysis:
2. Sensitivity analysis:
3. Goal-seeking analysis:
4. Optimization analysis:

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# c) Executive Support Systems

**Executive information system (EIS)** – A specialized DSS that supports senior level executives within the organization

- **Granularity**
- **Visualization**
- **Digital dashboard**

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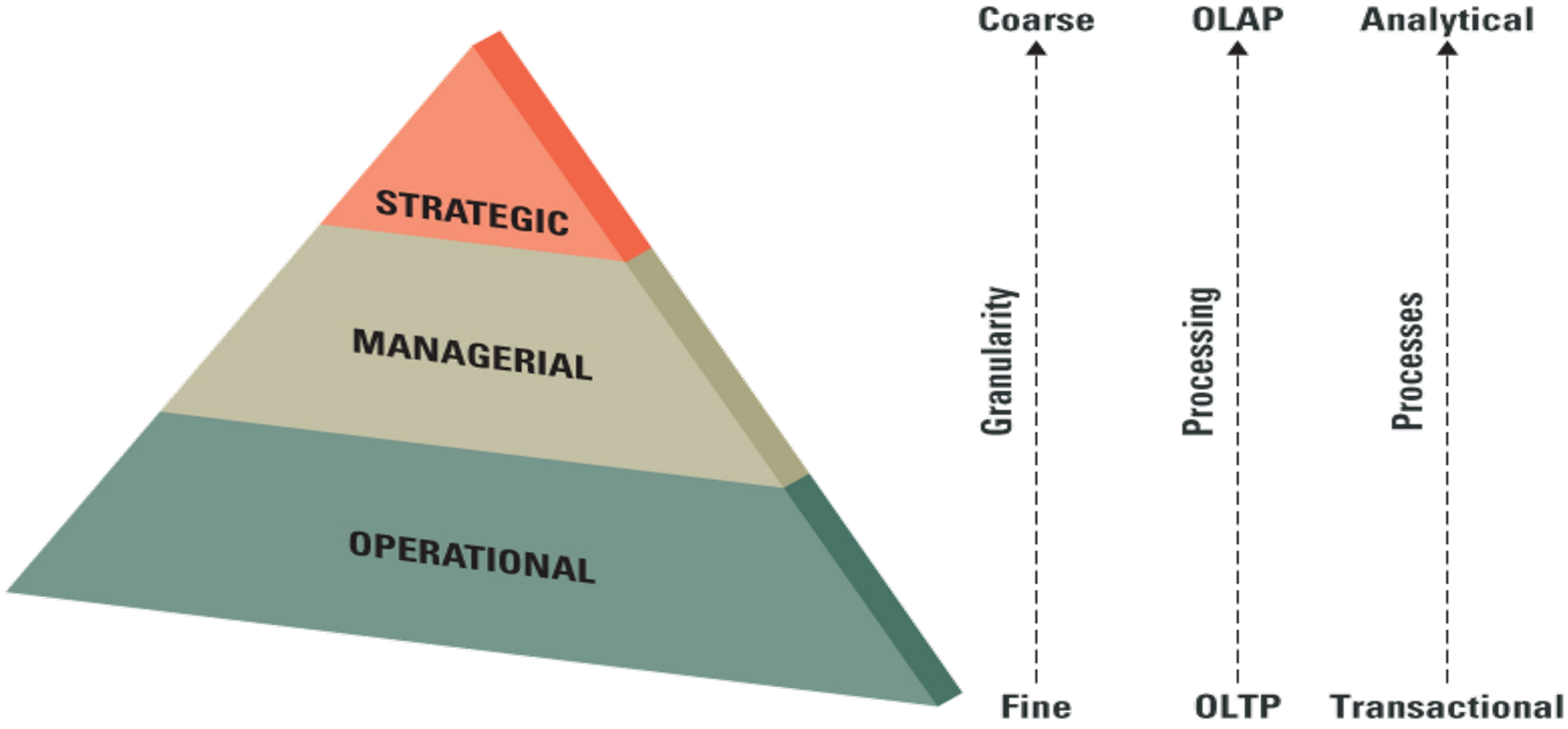
# Executive Support Systems

La estructura de una organización típica es similar a una pirámide




## Information Levels Throughout An Organization

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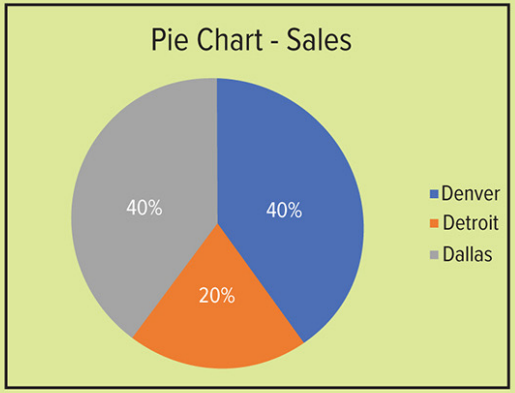
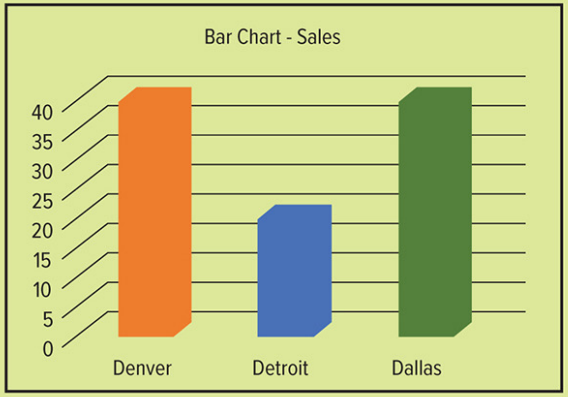
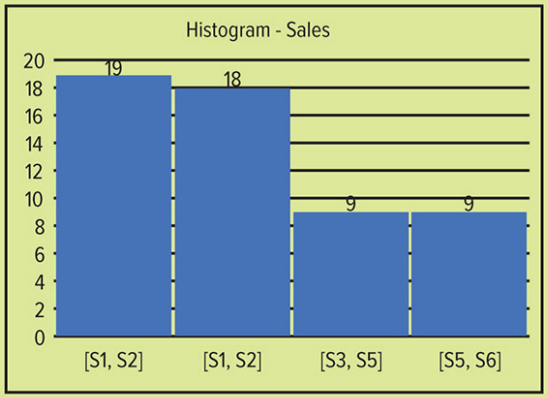
# Executive Support Systems

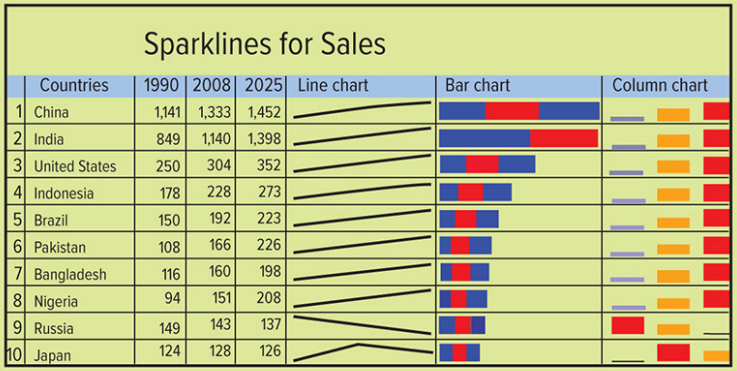
- **Visualization**
- **Digital dashboard**

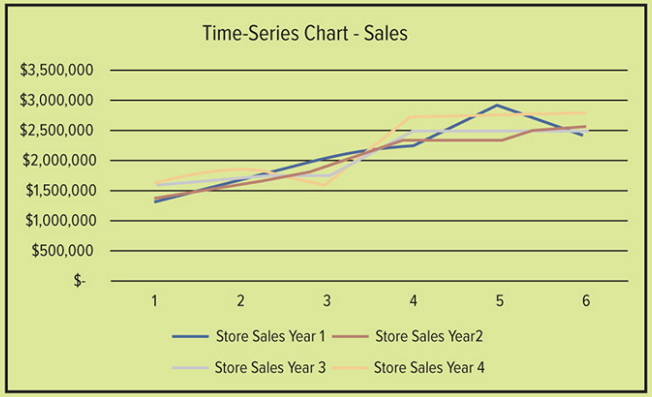


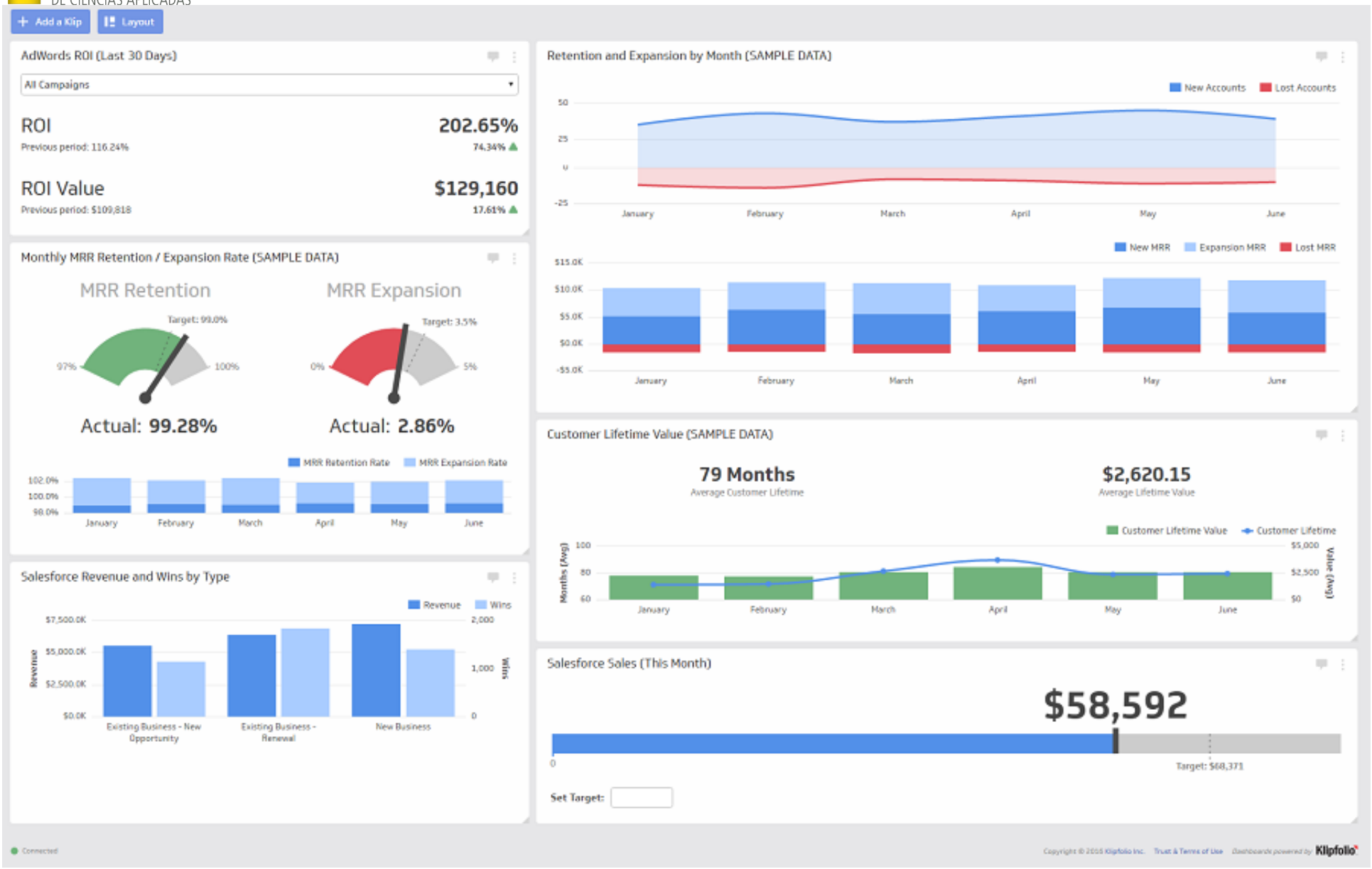



Add a Klip
Layout
AdWords ROI (Last 30 Days)
All Campaigns
ROI
202.65%
Previous period: 116.24%
74.34%
ROI Value
$129,160
Previous period: $109,818
17.61%
Monthly MRR Retention / Expansion Rate (SAMPLE DATA)
MRR Retention
Target: 99.0%
97%
100%
Actual: 99.28%
MRR Expansion
Target: 3.5%
0%
5%
Actual: 2.86%
MRR Retention Rate
MRR Expansion Rate
102.0%
100.0%
98.0%
January
February
March
April
May
June
Salesforce Revenue and Wins by Type
Revenue
Wins
$7,500.0K
$5,000.0K
$2,500.0K
$0.0K
2,000
1,000
0
Existing Business - New Opportunity
Existing Business - Renewal
New Business
Retention and Expansion by Month (SAMPLE DATA)
New Accounts
Lost Accounts
50
25
0
-25
January
February
March
April
May
June
New MRR
Expansion MRR
Lost MRR
$15.0K
$10.0K
$5.0K
$0.0K
-$5.0K
Customer Lifetime Value (SAMPLE DATA)
79 Months
Average Customer Lifetime
$2,620.15
Average Lifetime Value
Customer Lifetime Value
Customer Lifetime
Months (Avg)
100
80
60
$5,000
$2,500
$0
Value (Avg)
Salesforce Sales (This Month)
$58,592
0
Target: $68,371
Set Target:
Connected
Klipfolio

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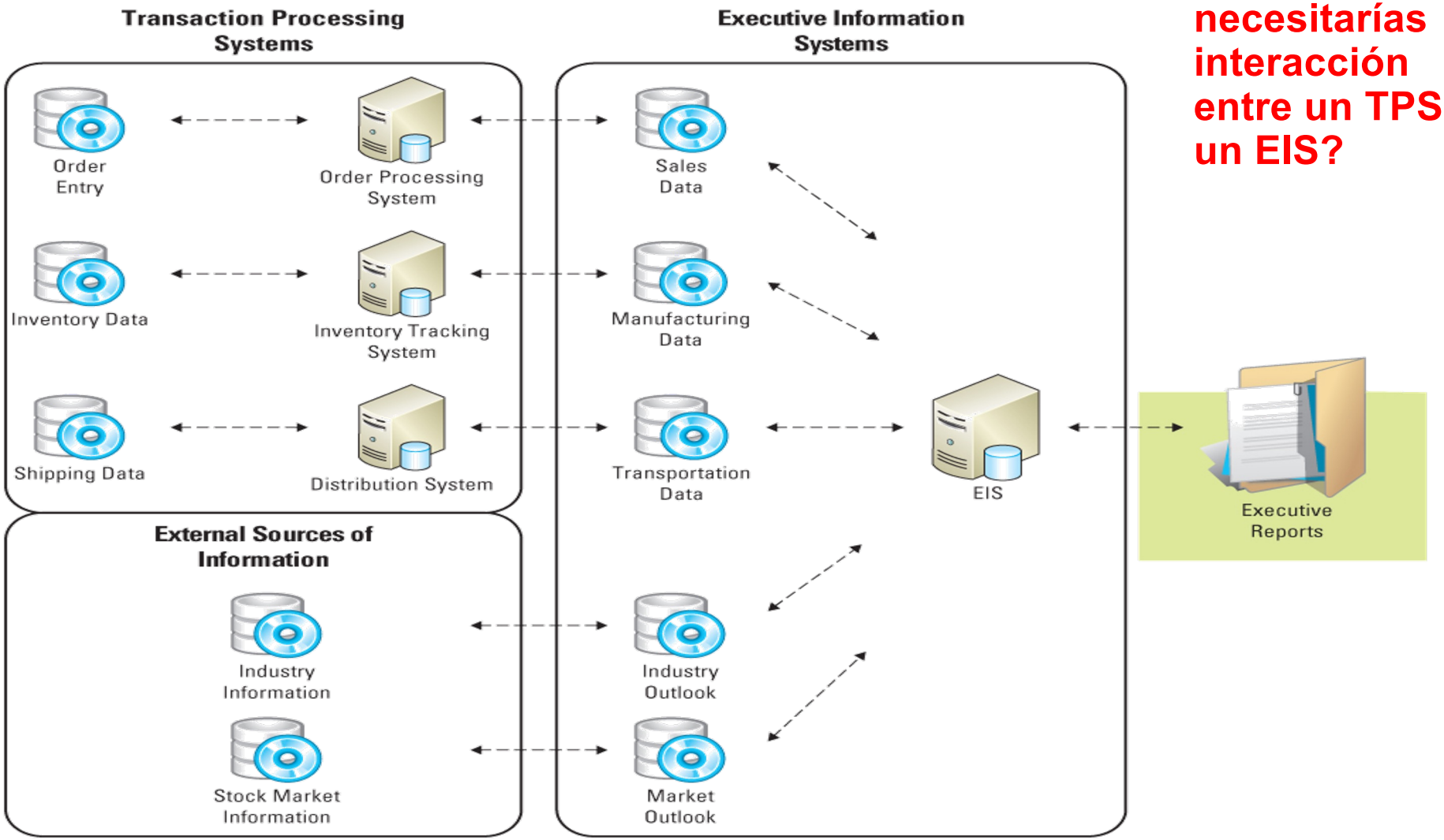
# Executive Support Systems

**Q: ¿Por qué necesitarías interacción entre un TPS y un EIS?**




## Interaction Between a TPS and EIS

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# Executive Support Systems

Most EISs offering the following capabilities:

- ***Consolidation*** is the aggregation of data from simple roll-ups to complex groupings of interrelated information. For example, data for different sales representatives can then be rolled up to an office level, then a state level, then a regional sales level.

- ***Drill-down*** enables users to view details, and details of details, of information. This is the reverse of consolidation; a user can view regional sales data and then drill down all the way to each sales representative's data at each office. Drill-down capability lets managers view monthly, weekly, daily, or even hourly information.

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# Executive Support Systems

- ***Slice-and-dice*** is the ability to look at information from different perspectives. One slice of information could display all product sales during a given promotion. Another slice could display a single product's sales for all promotions. Slicing and dicing is often performed along a time axis to analyze trends and find time-based patterns in the information.

- ***Pivot*** (also known as rotation) rotates data to display alternative presentations of the data. For example, a Pivot can swap the rows and columns of a report to show the data in a different format.

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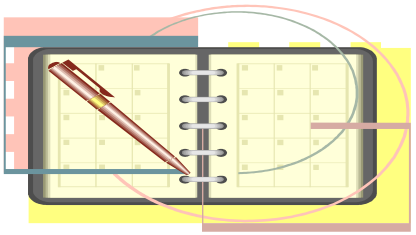
# Executive Support Systems

Q: ¿Si tuvieras que hacer un Tablero de Control estratégico para un Supermercado, qué información incluirías?



Q: ¿Qué decisiones podrían tomarse?

Q: Busquemos ejemplos de los tipos de analítica para el caso del Supermercado

1. Consolidación:
2. Drill-Down:
3. Slice-and-Dice:
4. Pivot:

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# LEARNING OUTCOMES

1. Explain the importance of decision making for managers at each of the three primary organization levels along with the associated decision characteristics
2. Define Critical Success Factors (CSFs) and Key Performance Indicators (KPIs), and explain how managers use them to measure the success of MIS projects
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# USING AI TO MAKE BUSINESS DECISIONS


En el aeropuerto de Manchester en Inglaterra, el robot limpiador **Hefner AI** alerta a los pasajeros a las reglas de seguridad y para no fumadores mientras friega hasta 65,600 pies cuadrados de piso por día. Los escáneres láser y los detectores ultrasónicos evitan que choque con pasajeros.

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# USING AI TO MAKE BUSINESS DECISIONS

SmartPump de Shell Oil mantiene a los conductores en sus automóviles en días fríos y húmedos de invierno. Puede reparar cualquier automóvil construido después de 1987 que haya sido equipado con una tapa de gasolina especial y un transpondedor montado en el parabrisas que le dice al robot dónde insertar la bomba.

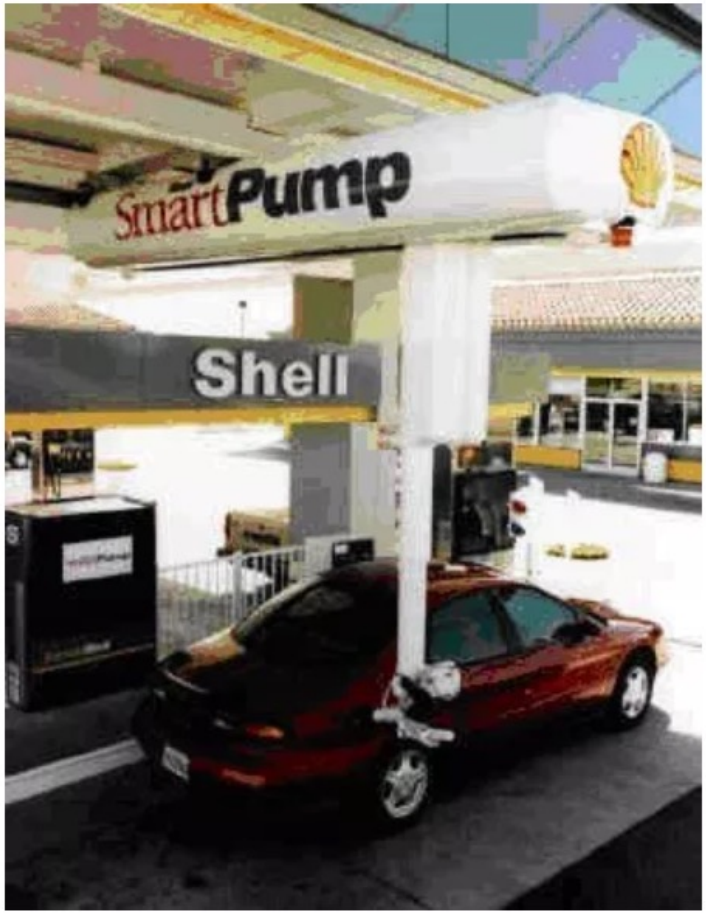


Figure 1: Shell Smart Pump

https://robotnews.wordpress.com/2006/04/07/service-robots-shell-smart-pump-2/

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# USING AI TO MAKE BUSINESS DECISIONS

El robot FireFighter AI puede extinguir llamas en plantas químicas y nucleares reactores con agua, espuma, polvo o gas inerte. El robot pone distancia entre operadores humanos y el fuego.

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# USING AI TO MAKE BUSINESS DECISIONS



https://youtu.be/HeV_glcTl2M

https://youtu.be/8nKPC-WmLjU

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# USING AI TO MAKE BUSINESS DECISIONS



**Artificial intelligence (AI) –** Simulates human intelligence such as the ability to reason and learn

**Intelligent system –** Various commercial applications of artificial intelligence

Aumentan la velocidad y la consistencia de la toma de decisiones, resuelven problemas con información incompleta y resolver problemas complicados que no se pueden resolver por computación convencional.

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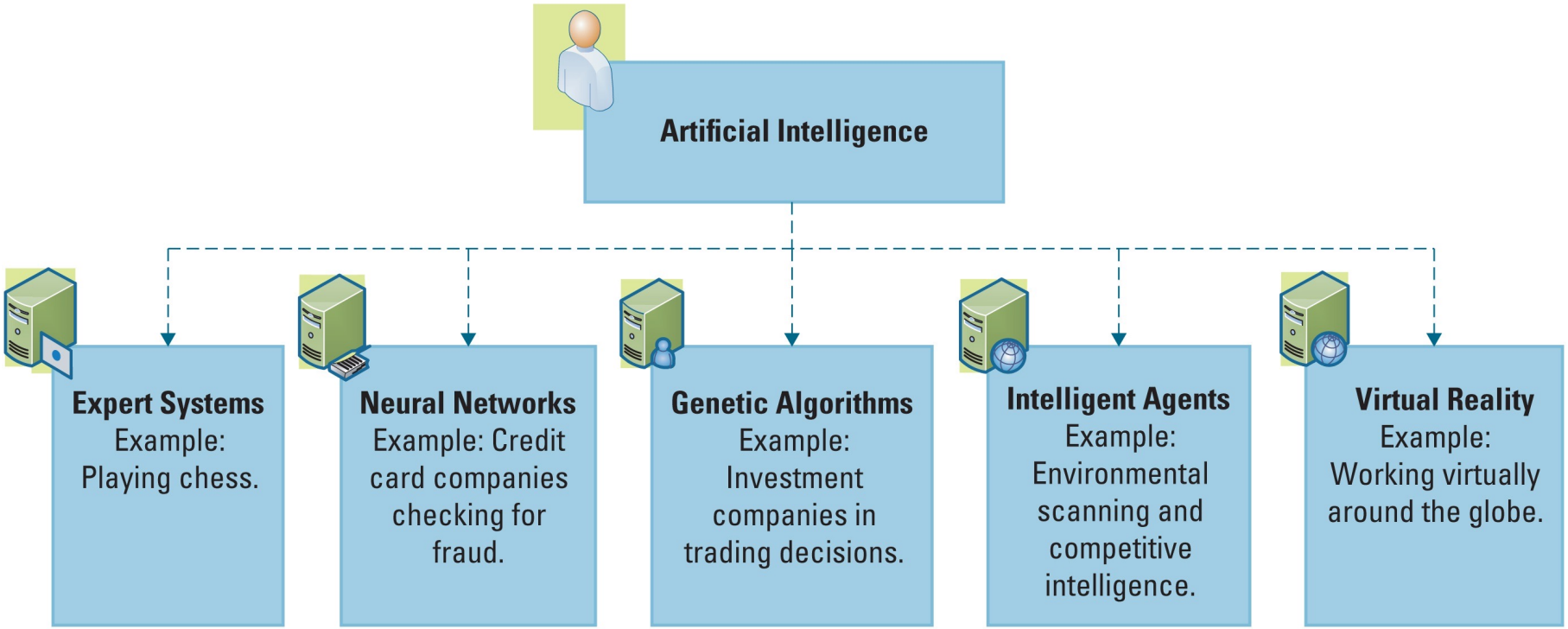
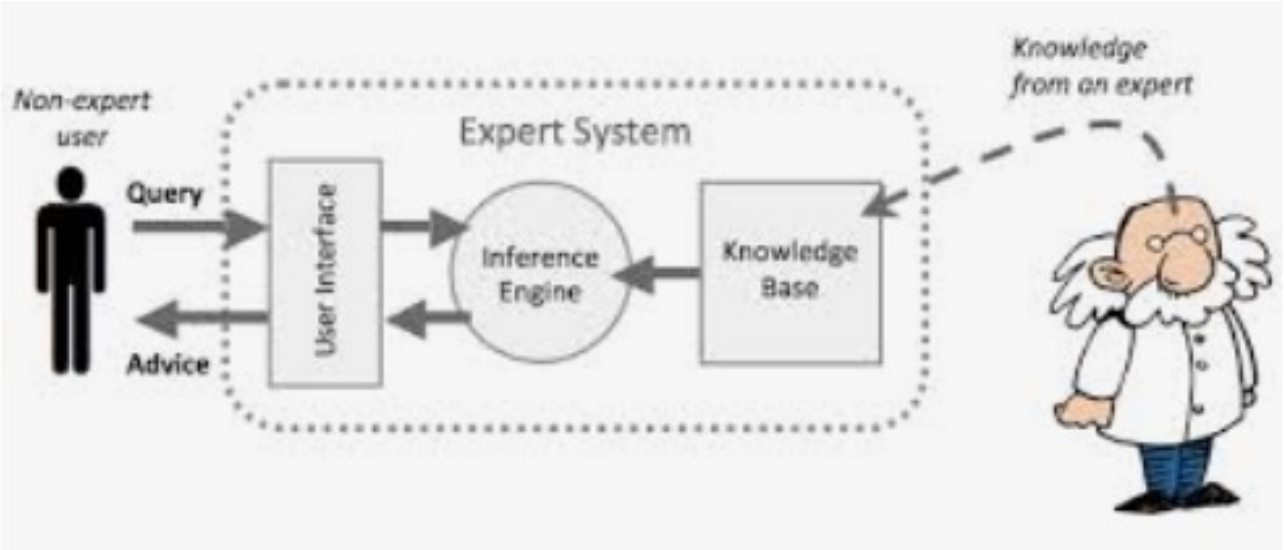
# USING AI TO MAKE BUSINESS DECISIONS



# USING AI TO MAKE BUSINESS DECISIONS




1. **Expert system –** Computerized advisory programs that imitate the reasoning processes of experts in solving difficult problems

Most expert systems contain information from many human experts and can therefore perform a better analysis than any single human.

Q: ¿En qué campos creen se puede utilizar estos sistemas?

Análisis de préstamos,
Pronósticos

# USING AI TO MAKE BUSINESS DECISIONS

2. **Neural Network** – Attempts to emulate the way the human brain works

   **Fuzzy logic** – A mathematical method of handling imprecise or subjective information

Neural networks are most useful for decisions that involve patterns or image recognition.

Typically used in the finance industry to discover credit card fraud by analyzing individual spending behavior

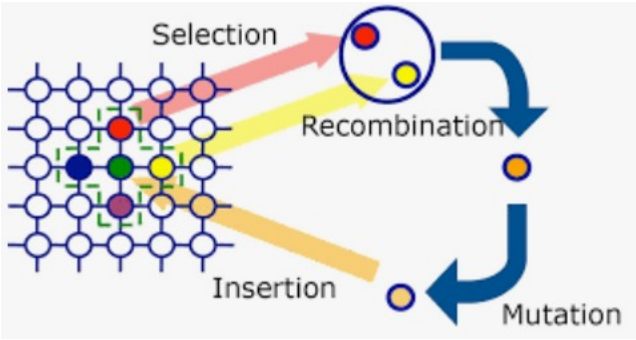
Q: ¿En qué campos creen se puede utilizar estos sistemas?

Industria financiera para descubrir fraudes con tarjetas de crédito

# USING AI TO MAKE BUSINESS DECISIONS

3. **Genetic algorithm** – An artificial intelligent system that mimics the evolutionary, survival-of-the-fittest process to generate increasingly better solutions to a problem

Essentially an optimizing system, it finds the combination of inputs that give the best outputs.




Q: ¿En qué campos creen se puede utilizar estos sistemas?

**Shopping bot** – Software that will search several retailer websites and provide a comparison of each retailer's offerings including price and availability.

# USING AI TO MAKE BUSINESS DECISIONS

4. **Intelligent agent** – Special-purpose knowledge-based information system that accomplishes specific tasks on behalf of its users.

Used for environmental scanning and competitive intelligence.

An intelligent agent can learn the types of competitor. information users want to track, continuously scan the Web for it, and alert users when a significant event occurs.

Ej: Amazon fulfillment center

Spot – Boston Dynamics

https://www.bostondynamics.com/spot

# USING AI TO MAKE BUSINESS DECISIONS

**5. Virtual reality** - A computer-simulated environment that can be a simulation of the real world or an imaginary world.

***Virtual Reality -*** Examples: games, cargo transport systems, complex adaptive systems

***Augmented reality*** – the viewing of the physical world with computer-generated layers of information added to it

***Google Glass*** – A wearable computer with an optical head-mounted display

***Virtual workplace*** – a work environment that is not located in any one physical space

***Haptic interface*** – uses technology allowing humans to interact with a computer though bodily sensations and movements

# USING AI TO MAKE BUSINESS DECISIONS

a) ¿Cómo se podrían aplicar estas categorías para tomar decisiones de negocios en Paraguay? Explica / Da ejemplos

b) Elige una de la empresas y analiza, ¿qué tipo de AI usarías para la toma de decisiones? ¿qué tipo de decisiones? ¿por qué? ¿a qué nivel?

1) Banco
2) Frigorífico de Carne
3) Call Center de Atención al cliente

***Comentaremos las respuestas mañana al inicio de la clase***
***Cada grupo debe presentar sus respuestas***

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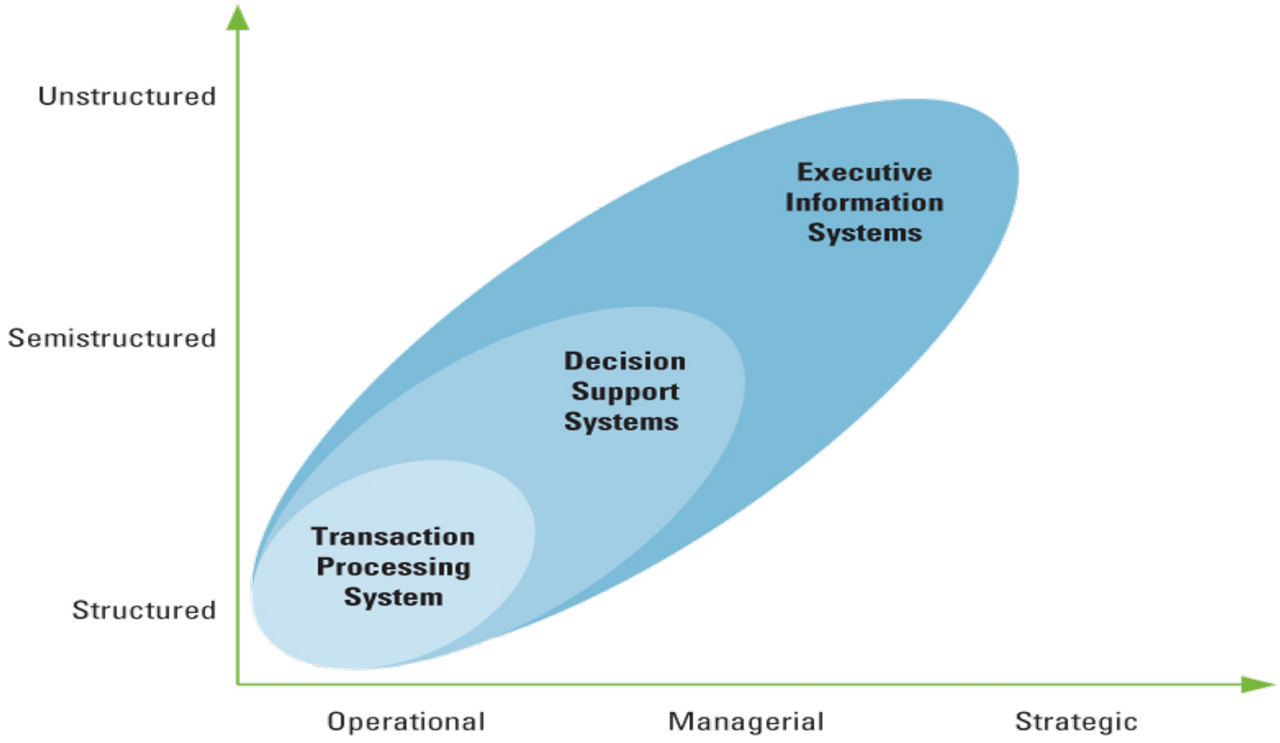
# ¿Qué aprendimos hoy?

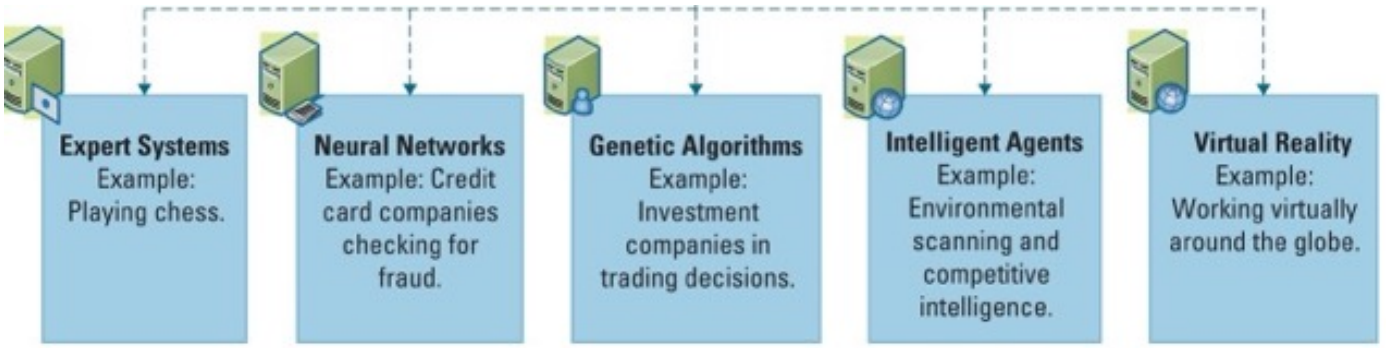



***Transaction processing system (TPS)* -** basic business system that serves the operational level and assists in making structured decisions.

***Decision support system (DSS)* –** models information to support managers and business professionals during the decision-making process

***Executive information system (EIS)*** – a specialized DSS that supports senior level executives within the organization

## USING AI TO MAKE BUSINESS DECISIONS



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# TRABAJO DE INVESTIGACIÓN

17/08/2022

Actividad GRUPAL (3 y 4 personas) – 15% de la Calificación Final