

# Hi I'm Grace Skelley

### Welcome to my portfolio!

"I am a professional business intelligence analyst with experience in the Medical and Healthcare industry.

My goal is to have a sustainable impact on the organization's success with the use of my extensive research, compelling visualizations, and project coordination/management abilities. I aim to make a difference by leveraging my accumulated analytical skill sets in discovering innovative solutions, through a data-driven approach fueled by creativity, and critical thinking.

My professional experience in business operations in multiple departments – big and small organization settings has deepened my understanding of the importance of well-organized, competent workflow procedures influenced by data-rich decisions. Therefore, my desire and determination to bring positive changes are what pushed me to evolve my career map."



June July

# PROJECT EXCERPTS

INSTACART

Python-based project on Consumer Behavior Trends and Marketing Analysis

ROCKBUSTER STEALTH LLC

International Business Analysis of Online Video Rental Services through SQL

PREPARING FOR INFLUENZA SEASON IN THE US

A National Medical Staffing Distribution based on Historical Trends

GAMECO

Global Marketing Analysis of the Gaming Console Industry

PROJECT 5

Coming soon...



### **OBJECTIVE**

Produce an exploratory analysis of consumer behavior and sales patterns in sustaining information that will benefit sales and marketing departments in developing tactical promotional efforts.

### **PROJECT & DATA**

- Project Brief
- Customer Data Set, Customer Orders, Products, and Department | Modified Open Source from Instacart
- Data Dictionary | Link provided by CareerFoundry

### **LIMITATIONS**

- Data only contains records from 2017.
- Customer demographics are limited to income, age, family size, and marital status.

### **TECHNIQUES APPLIED**

- Data Cleaning: Wrangling and Subsetting
- Data Consistency Checks
- Combining and Exporting Data
- Deriving New Variables
- Grouping Data and Aggregating Variables
- Python Visualization and Excel Report

### **TOOLS**









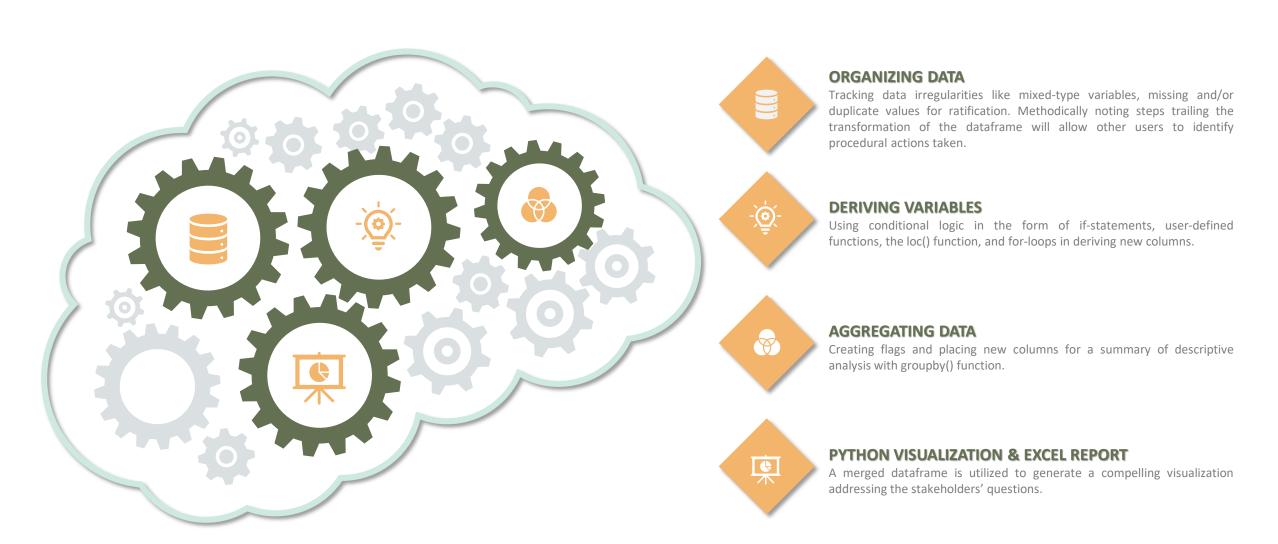








# DATA MANAGEMENT



# **BUSINESS ANALYSIS**









ANALYTICAL & VISUALIZATION TOOLS APPLICATION

Saturday, Sunday, and Friday are the busiest days for shoppers.

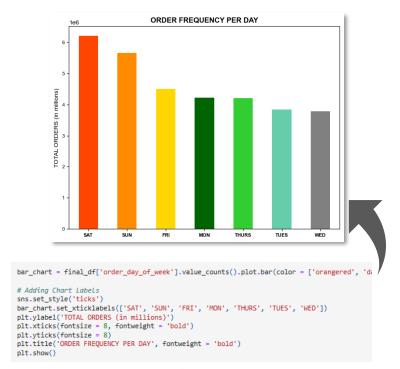


FIG. 4a

Purchasing frequency increases between 9 am through 3 pm.

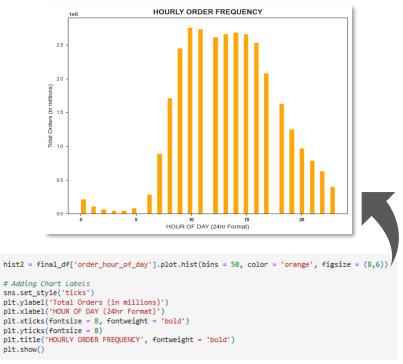


FIG. 4b

### There are 21 departments that offer multiple **price** ranges.

department	HIGH	LOW	MID
alcohol	-	33,046	111,581
babies	-	121,484	288,908
bakery	-	274,986	845,842
beverages	-	814,697	1,757,204
breakfast	-	209,185	461,665
bulk	-	1,181	32,270
canned goods	-	281,711	730,363
dairy eggs	4,877	1,370,908	3,801,397
deli	-	299,220	704,614
dry goods pasta	-	284,346	537,790
frozen	-	647,617	1,474,114
household	-	245,070	454,787
international	-	73,203	182,788
meat seafood	392,855	=	281,926
missing	-	18,516	46,252
other	-	15,259	19,152
pantry	221	504,521	1,277,963
personal care	-	123,874	300,432
pets	-	28,165	64,895
produce	-	2,585,708	6,493,565
snacks	-	1,742,143	1,024,263

#16 Department Price Range and Check Output

dept\_prc\_rnge = pd.crosstab(df\_cstmr\_prf1['department'], df\_cstmr\_prf1['price\_range']) dept\_prc\_rnge

**VIEW FULL REPORTS BELOW** 





FIG. 4c

# **CONSUMER** SEGMENT ANALYSIS









ANALYTICAL & VISUALIZATION TOOLS APPLICATION







The customers' income ranges between low to mid-range describing probable spending power.

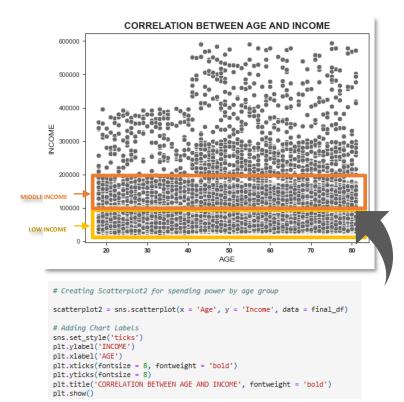


FIG. 4d

### Seniors appear to be frequent shoppers.

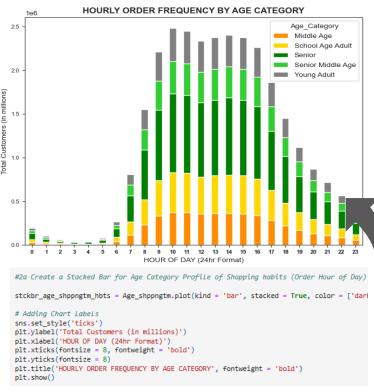


FIG. 4e

### Produce, dairy eggs, and snacks are the most profitable goods.

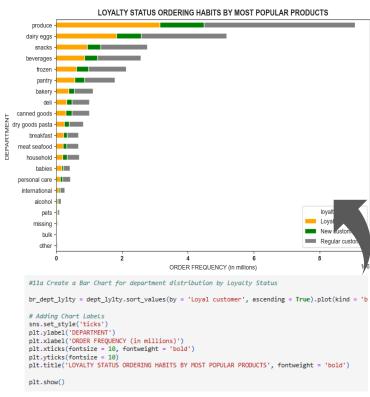


FIG. 4f

# RECOMMENDATIONS

### **CONSUMER TREND**

### **ADVERTISEMENT**

Product endorsements of the least popular products like international, pantry, etc. should be promoted on weekends (Fridays, Saturdays, and Sundays) between 9 am and 3 pm, leveraging fast-moving goods such as dairy eggs, beverages, and beverages so on.

Looking into competitors' pricing schemes and conducting surveys on consumers' household expenditures can disclose key information for effective pricing tactics.

**COMPETITOR ANALYSIS** 



### **CUSTOMER SEGMENT**

Offering special rates and rewards through a point system tailored to members' interests maintains loyal buyers and converts non-frequent buyers' status to a higher level.

### **RESEARCH & DEVELOPMENT**

Expand the services to new target audiences that may be interested in the premium brands and an exclusive offer on executive packages can spark new interests and eventually extend business in that area.





### **EXCERPT**

# ROCKBUSTER STEALTH LLC

A fictitious rental movie company that had storefronts across the world, is confronting tough competition from online streaming services like Netflix and Amazon Prime. To remain competitive, the management plans to launch an online rental service.

### **OBJECTIVE**

Provide insights on the current business standings to support the company's 2020 marketing campaign for a new product launch.

### **PROJECT & DATA**

- Project Brief
- This mock dataset is provided by CareerFoundry and can be downloaded here.

### **LIMITATIONS**

 Data covers internal records of stores, customers, payments, inventory, films, and more.

### **TECHNIQUES APPLIED**

- Relational Databases
- Entity Relationship Diagram (ERD)
- Data Dictionary
- Database Querying
- Filtering Data
- Data Cleaning and Summarizing
- Joining Tables
- Subqueries
- Common Table Expressions

### **TOOLS**











# DATA MANAGEMENT





### **ASSESSING DATABASE**

Initial review and crafting of an Entity Relationship Diagram (ERD) through DbVisualizer describes the structure of the database for analysis and capturing it through a data dictionary for user accessibility.



### **DATA CLEANING**

Performing CRUD functions ensures a clean and consistent format for filtering as well as summarizing data for output accuracy.



### **DATA EXTRACTION & SUMMARIZATION**

Extracting records using Joining Tables, Subqueries, and Common Table Expressions (CTEs) commands allow an extensive comprehension of the current business standings.



### **DATA VISUALIZATION & STORYTELLING**

SQL results are converted to CSV files to generate visualization with ease for the final presentation and tableau storyboard.

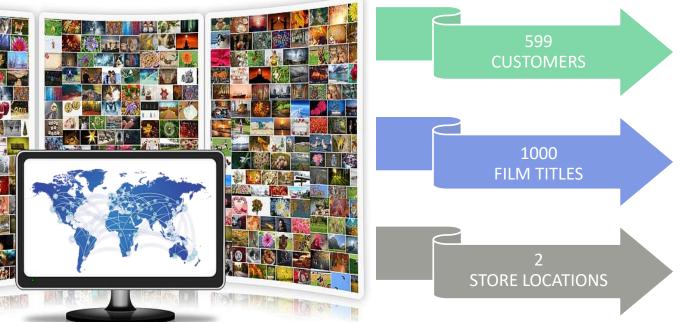
# **BUSINESS PROFILE OVERVIEW**











The business is accessible internationally and presently servicing 108 countries.

### **OFFERING WIDE SELECTIONS:**

- 5 Film ratings
- 16 Genres
- 1 Language (English)

### **AUSTRALIA & CANADA BRANCHES ARE FULLY OPERATING:**

- 2 Staff
- 4581 Inventory
- 16,044 Movie Rentals





# **BUSINESS ANALYSIS**





ANALYTICAL & VISUALIZATION TOOLS APPLICATION



22% of the viewers are likely to engage in PG-13 movies while the sports film genre has the dominant rental rate.





FIG. 3b

### Asia takes up 45% of the customer base with China and India generating the highest revenue globally.





FIG. 3d

# RECOMMENDATIONS

### ONLINE VIDEO RENTAL SERVICES

### **TARGET AUDIENCE**

Determine the micro and macro environment in China, India, and its surrounding areas adapting services that meet cultural demands.

# 200

### PRODUCT DEVELOPMENT

### **REWARDS PROGRAM**

Incentivizing top-paying customers establishes strong client rapport and opens up opportunities to offer new services that best fit their interests.

### **BUSINESS DEVELOPMENT**

Assess high-performing countries and understand consumer demands to replicate successful operations in other potential markets.





# PREPARING FOR INFLUENZA SEASON IN THE U.S.

A medical staffing agency aims to allocate temporary workforces in the most impacted areas to mitigate the influenza outbreak for the coming season. With limited resources to hire new employees, they are determined to support the healthcare system across all 50 states.

### **OBJECTIVE**

Analyze historical influenza trends in the U.S. to assist the medical staffing agency in the deployment of temporary healthcare personnel for the upcoming season.

### **PROJECT & ALTERED DATA**

- Proiect Brief
- Influenza deaths | Source from CDC
- U.S. Population | Source from U.S. Census Bureau
- Influenza Visits & Influenza Lab Tests | Source from CDC (Fluview)
- Children's Flu shot rates | Source from CDC

### **LIMITATIONS**

- Influenza deaths data comprises 82% of death counts below 10 that are suppressed for confidentiality.
- Death records identify a single underlying cause of deaths (influenza-initiated may not be counted).
- Data sets are dated from 2009 to 2017.
- Information on hospital sizes and staffing capacity is unknown.

### **TECHNIQUES APPLIED**

- Designing a Data Research Project
- · Data Profiling and Integrity
- Data Cleaning
- Data Transformation and Integration
  - Excel: Pivot Tables and VLOOKUP
- Statistical Analysis and Hypothesis Testing
- Data Visualization and Storytelling (Tableau)

### **TOOLS**







# DATA MANAGEMENT





### **DESIGNING DATA RESEARCH PROJECT**

Interpreting business requirements to data questions leads to a research hypothesis that serves as a guideline for the analysis. A project management plan is prepared to keep track of progress.



### **DATA PREPARATION**

Exploring the datasets for information relevancy, integrity, completeness, etc. will help produce valuable insights. Then, transforming and integrating multiple data discloses the influenza case developments that will warrant the planning phase.



### STATISTICAL ANALYSIS & HYPOTHESIS TESTING

Performing statistical methods that detect critical age populace targeted by influenza will model the next steps in preparation for the staff distribution. The relations of multiple variables are then confirmed through t-testing.



### **DATA VISUALIZATION & STORYTELLING**

Data results are utilized for a compelling tableau presentation disclosing influenza trends and vulnerable age populations.

# STATISTICAL ANALYSIS & HYPOTHESIS TESTING



According to statistics influenza mortality rate is much higher in adults over 65 years old, hence susceptible to developing severe cases than in younger age groups.

If the mortality rate is high among adults over 65, there's an increased demand for medical workers. Research Hypothesis: Dependent Variable: Influenza death Independent Variable: **US** Population **Null Hypothesis:** H<sub>O</sub>: Influenza Mortality Rate < Adults over 65 years Alternative Hypothesis: H<sub>A</sub> Influenza Mortality Rate > Adults over 65 years 1.50984960014892E-130 P-Value:

FIG. 2d

	H <sub>o</sub> : Influenza Mortality Rate < Adults over 65 years	H <sub>A</sub> : Influenza Mortality Rate > Adults over 65 years	
Mean	0.21%	0.63%	
Mean Difference		0.42%	
Standard Deviation	0.00219507	0.002149116	
t-Test: Two-Sample Assuming Une	qual Variances		
Mean	0.002145587	0.002145587 0.00629654	
Variance	4.81833E-06	4.6187E-06	
Observations	455	455	
Hypothesized Mean Difference	0		
df	908	<b>;</b>	
t Stat	-28.82280638	<b>;</b>	
P(T<=t) one-tail	1.53E-130		
t Critical one-tail	1.646533511	•	
P(T<=t) two-tail	3.0583E-130		
t Critical two-tail	1.962580045		

The **normalized death rate** shows the correlation by age group and illustrates the magnitude of influenza deaths.

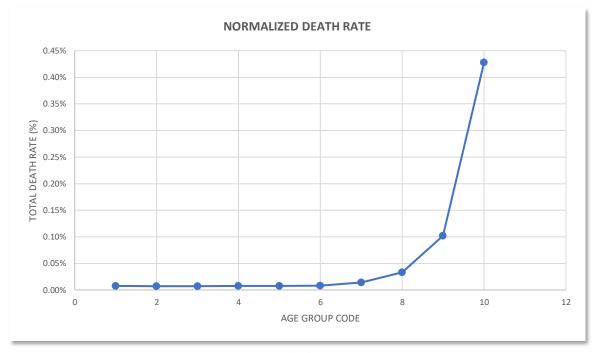


FIG. 2e FIG. 2f









# TIME SERIES ANALYSIS



Influenza transpires all year round, however, it has penetrating effects in colder climates.

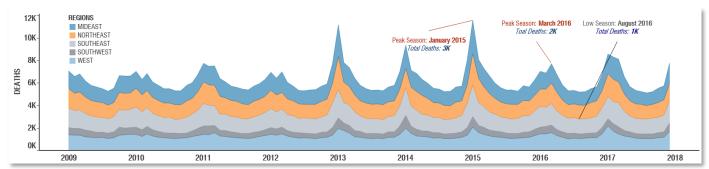
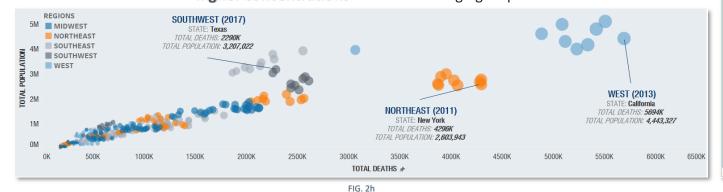


FIG. 2g

The **death ratio** is proportional to population size signifying a substantial impact on regions with higher concentrations of vulnerable age groups.



California, New York, Texas, and Florida are states with a strong density level of vulnerable populations with significant death rates.

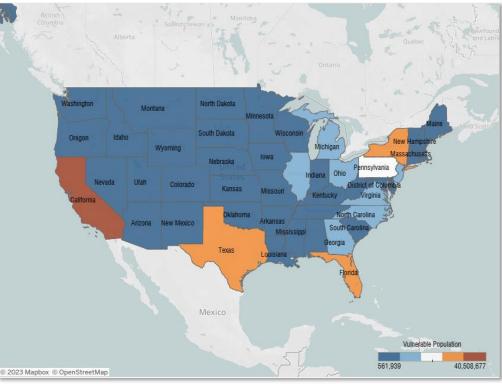


FIG. 2i



# RECOMMENDATIONS

### NATIONAL MEDICAL STAFFING

### STAFFING DISTRIBUTION

Allocate 32% of medical personnel to high-priority level regions - California, New York, Texas, and Florida arranging the deployment close to the colder weather.

### MONITORING PROGRAM

Yearly surveillance of influenza cases should be carefully measured to aid in planning medical staffing for future events.

### **RESEARCH ANALYSIS**

Investigating the hospitals' and clinics' capacities can reinforce actionable numbers to efficiently designate temporary healthcare workers at state and county levels.

### **PUBLIC AWARENESS CAMPAIGN**





# **GAMECO**

A fictional newcomer to the video game industry deems that sales have been the same over time and is interested to understand the current marketing developments.

### **OBJECTIVE**

Perform a 10-year descriptive analysis to gain insights into the current video game developments for marketing and sales teams' 2017 budget planning.

### **PROJECT & DATA**

- Project Brief
- This mock 1980 to 2016 video game sales data is available here.
- Data sourced from VGChartz.
- VGChartz's data collection methodology is available here.

### **LIMITATIONS**

- Tracks the total number of units sold (not financial figures) to the retail stores.
- 2016 is the latest year logged with partial records.

### **TECHNIQUES APPLIED**

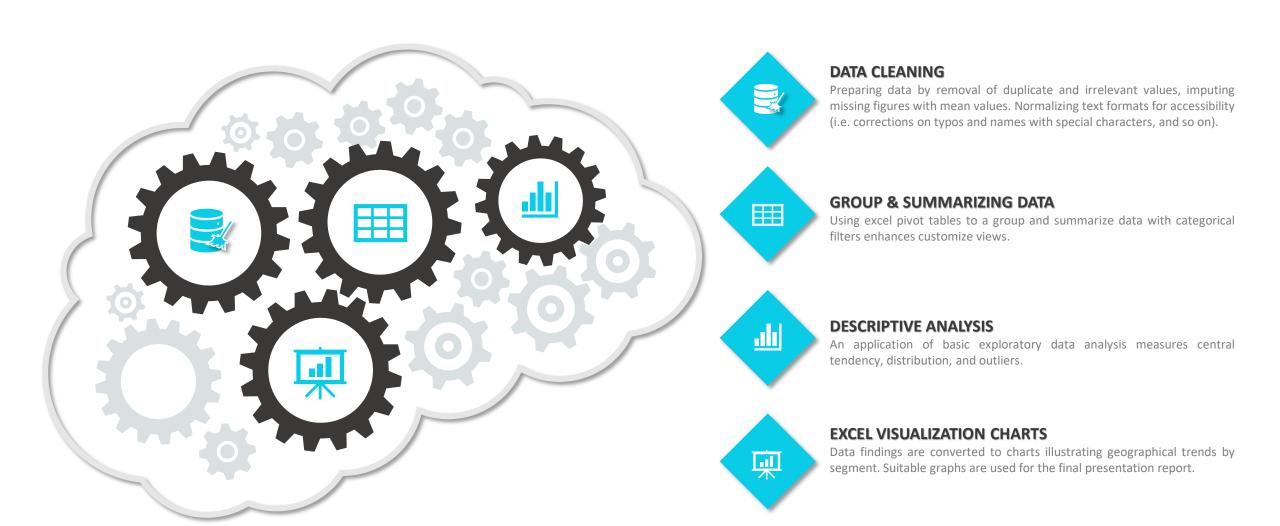
- Data Integrity, Quality and Consistency Assessment
- Data Cleaning
- Pivot Tables
  - Data Grouping & Summarizing
  - Calculated Fields
- Descriptive Analysis
- Excel Visualization Results
- PowerPoint Presentation

### **TOOLS**





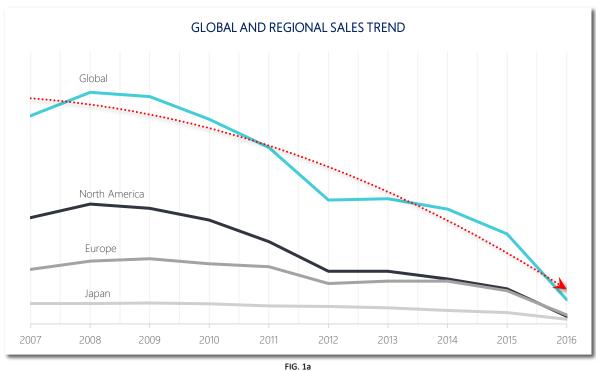
# DATA MANAGEMENT



# INITIAL ANALYSIS

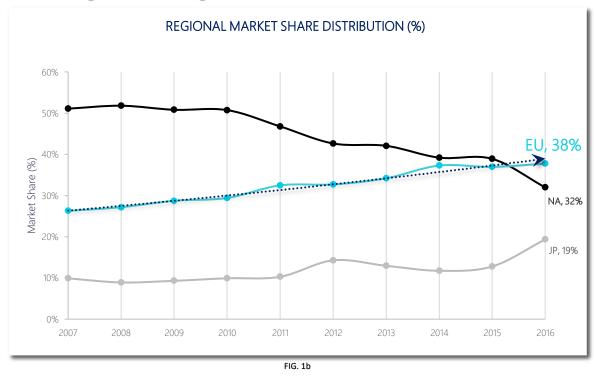


A declining pattern in overall sales refutes the executives' current business understanding.



- North America is the strongest sales performing region suffers the sharpest drop.
- Europe 2<sup>nd</sup> largest market follows similar trend with all other regions.
- Japan a single-country market shows minimal impact of the declining development.

The sales ratio molds the **market share trend** demonstrating **distinctive** results of each **regional business growth**.

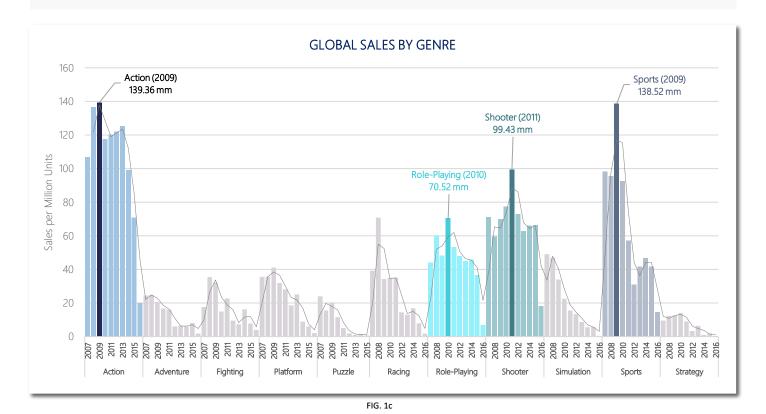


- North America plummets to the 2<sup>nd</sup> leading profitable region.
- Europe continuously climbs taking over the highest market share.
- Japan's unstable growths illustrates positive growth from 2014.

# MARKET TREND ANALYSIS



**Genre popularity** changes over time suggesting **Action**, **Sports**, **Shooter**, and **Role-Playing** are likely to maintain **video game players' interests** while other categories eventually diminish globally.



Identifying regional consumer developments observes opportunities leveraging on high-demand game categories adapted to each target market's interests.

### **TOP-PERFORMING GENRE**

makes up more than **50%** of sales by region.

RANK	EUROPE	NORTH AMERICA	JAPAN
1	Action	Action	Role-Playing
2	Shooter	Shooter	Action
3	Sports	Sports	

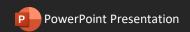
FIG. 1d

### TOP-SELLING PLATFORM

makes up above 69% of sales in each region.

RANK	EUROPE	NORTH AMERICA	JAPAN
1	PS3	X360	DS
2	X360	WII	3DS
3	WII	PS3	PS3
4	DS	DS	PSP

FIG. 1e



# RECOMMENDATIONS

**GLOBAL MARKET** 

### **BUDGET DISTRIBUTION**

Investing 38% of the resources to European market support its the year-to-year stable growth.

### **SALES DEVELOPMENT**

Explore sales channels (*online vs. retail*) and acquire current platform trends used for promoting and selling products.

### **TARGET MARKET**

Implement consumer behavior reports in diagnosing buying and spending habits to disclose detailed facts on product preferences including purchasing power trends.

### **SCHEMATIC TRADING**

Conduct an in-depth marketing analysis on publishers' recent product developments to discover the profitable trends and partnering with new enterprises.



