DATA ANALYSIS PORTFOLIO



Professional Background

I am well versed on Planning, Project implementation & operations/maintenance management of Data Center/Critical infrastructure and Power Systems Engineering and backup power infrastructures. I have overseen Planning, implementing and operations management of Data Centers/Critical infrastructure on behalf of telecommunication/Data Center Colocation companies such as 21st Century Technologies Limited, Emerging Markets Telecommunications Services Ltd (trading as 9Mobile) and MTN Nigeria. I am currently engaged with Master Power Technologies & Solutions Limited a Data Centers/Critical facilities contracting and Power solution company where my primary responsibilities are Project Management and Managed services activities for Data Center/Critical facilities for third parties.

The following are some of my skill sets: Leadership, Time Management, Root-Cause Analytics, Electrical/Mechanical & Plumbing System, Effective Communication, Microsoft Office (Word, Excel, Project, Power point), Project Management, Electrical Power Systems, Cabling, Cable Management, Generators, Cooling systems, Power Backup systems, Electrical Controls, Facility Management, Power Project Development, environmental monitoring systems, Power Optimization etc.

I hold a Post graduate Diploma (PGD) in Project Management Technology from Federal University of Technology Owerri, a Master of Engineering (M.Eng.) in Electrical and Electronics Engineering from Enugu State University of Science and Technology, a Bachelor of Engineering (B.Eng.) in Electronic Engineering from the University of Nigeria Nsukka.

With the fast growth in Data Sciences, I am very enthusiastic in the use of Data Analytics to improve my decision making and management skills.

Portfolio Outline

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Project 1: Udemy



Udemy Project Description

- Udemy is an education technology company that provides online learning and teaching platform with over 213000 courses and 62 million students. The management of Udemy wants to make informed decisions using data generated from their operations. Their target is to better understand the pricing and subscriptions of Udemy courses (for four different subjects) and identifying trends and patterns. This will help them Identify for which subject more courses should be created and create targeted strategies to increase the company's revenue.
- The raw Data of Udemy courses were used to carry out analysis. The outcome of the analysis is presented in this report in words and visual forms. The finds and recommendations are presented also in this report. This executive brief will make it very easy for Udemy management to assimilate and make very informed decisions as regards the best strategies to formulate and direction the business should move in.

The Problem

Six key questions were formulated in order to better understand the problems and help to better collate the data gathered in its best useful formations. These six key questions are:

- 1. What are the total numbers of subscribers in each subject?
- 2. How does the average content duration/price/number of students vary across different subjects?
- 3. How many courses are free and paid for each subject?
- 4. What is the average price of web development courses at different levels?
- 5. What are the 20 most popular courses? Also, include the following information:
 - Their level
 - Whether they are free or paid
 - Whether any are free beginner courses,
 - and the duration of the courses.
- 6. Does content duration impact the price of the course?

Data Design

The four areas of Udemy management concentration were Business Courses, Design Courses, Web development Courses and Musical Courses. The datasets of these four areas of interest were collected through two methods;

- 1. Primary data collection method: Interviews, Focus groups, Questionnaires and Surveys.
- 2. Secondary data collection method: Financial statements, Sales reports, Customer personal information and the Internet.

The datasets of these four areas of interest were supplied independently. Data consolidation process was used in gathering and combining data from these sources and making them into one coherent and presentable dataset in google sheet.

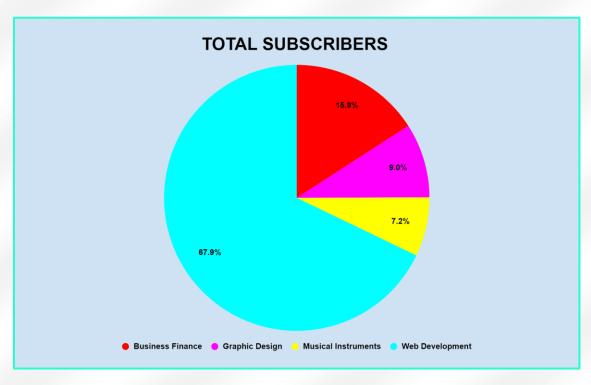
The consolidated data were cleaned by removing duplicate data, incomplete data and inconsistent or inaccurate data. This data cleaning process ensured that the dataset is accurate and ready for analysis.

Exploratory data analysis was done using descriptive statistic technique, this enabled us to better understand the dataset before applying some other analytic tools. The other analytical tools that were then employed to analyze the dataset based on the six key questions that was formulated are but not limited to; Pivot table, Function (SUM, AVERAGE, MAX, VLOOKUP, IF, etc.), Find & Replace.

Data visualization of the analyzed dataset was then carried out. Data Visualization helped to highlight the most relevant insights, and spot patterns, trends, and outliers. Data Visualization is about presenting data in visual formats, such as graphs, charts, etc.

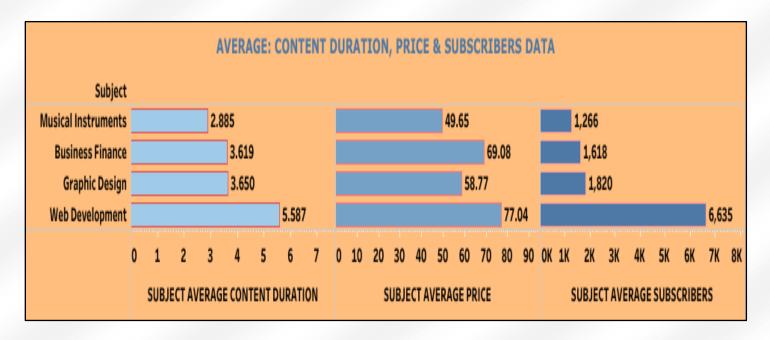
1. What are the total numbers of subscribers in each subject?

subject	SUM of num_subscribers	SUM of num_subscribers
Business Finance	1868711	15.89%
Graphic Design	1063148	9.04%
Musical Instruments	846689	7.20%
Web Development	7981935	67.87%
Grand Total	11760483	100.00%



- a. The total number of subscribers in each subject are
 - i. Business Finance 1,868,711 subscribers.
 - ii. Graphic Design 1,063,148 subscribers
 - iii. Musical instruments 846,689 subscribers
 - iv. Web Development 7,981,935 subscribers
- b. The total number of subscribers across the four subjects is 11,760,483.
- c. Web Development accounted for 67.87% of the total number of subscribers in the four subjects. This makes it the most sort after subject by Udemy subscribers.

2. How does the average content duration/price/number of students vary across different subjects?



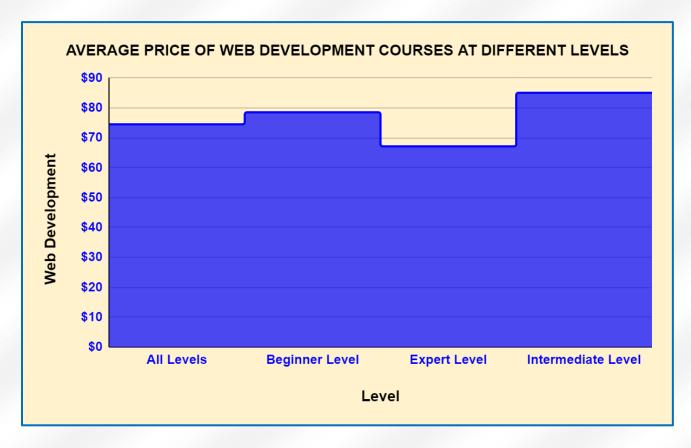
- a. Web Development subjects had the highest average across content duration, price and number of subscribers, while Musical Instruments had the lowest average across content duration, price and number of subscribers.
- b. Graphic Design had the second highest statistics in average content duration and average number of subscribers, while it had the third highest statistic in average price.
- c. Business Finance had the third highest statistics in average content duration and average number of subscribers, while in average price it had the second highest statistic.

3. How many courses are free and paid for each subject?

subject	Free	Paid	Grand Total
Business Finance	96	1059	1155
Graphic Design	35	549	584
Musical Instruments	46	623	669
Web Development	134	1069	1203
Grand Total	311	3300	3611

- a. 311 courses are Free, while 3,300 courses are Paid for.
- b. Web development subjects had the highest number of courses in both the free and paid course categories.
- c. Business Finance subjects had the second highest number of courses in both the free and paid course categories.
- d. Musical Instruments subjects had the third highest number of courses in both the free and paid course categories.
- e. Graphic design subjects had the least number of courses in both the free and paid course categories.
- f. The higher the number of the fee courses, the higher the number of the paid courses.

4. What is the average price of web development courses at different levels?



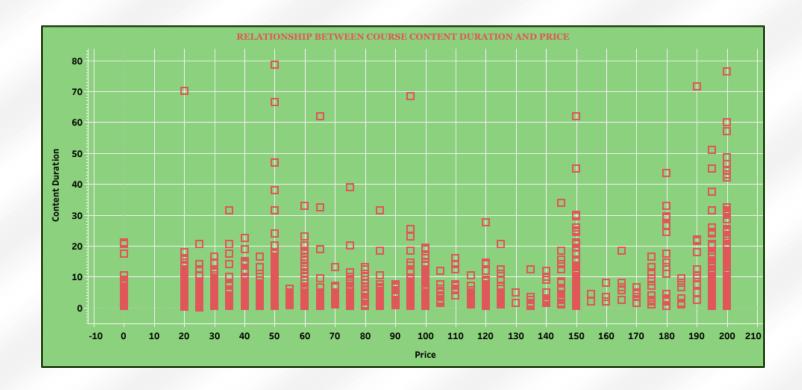
- a. The average price of web development courses at different levels are
 - i. All Levels \$74.55.
 - ii. Beginner Level \$78.54
 - iii. Expert Level \$67.14
 - iv. Intermediate Level \$85.07
- b. Web development intermediate level courses accounted for the highest average price tag in web development subjects, while its expert level courses accounted for the lowest average price tag.

5. What are the 20 most popular courses?

course_title	num_subscribers	level	free or paid course	free beginners course	content_duration
Learn HTML5 Programming From Scratch	268923	Beginner Level	Free	Yes	10.5
Coding for Entrepreneurs Basic	161029	Expert Level	Free	No	3.5
The Web Developer Bootcamp	121584	Beginner Level	Paid	No	43
Build Your First Website in 1 Week with HTML5 and CSS3	120291	All Levels	Free	No	3
The Complete Web Developer Course 2.0	114512	Beginner Level	Paid	No	30.5
Free Beginner Electric Guitar Lessons	101154	All Levels	Free	No	4.5
Web Design for Web Developers: Build Beautiful Websites!	98867	All Levels	Free	No	3
Learn Javascript & JQuery From Scratch	84897	All Levels	Paid	No	2
Practical PHP: Master the Basics and Code Dynamic Websites	83737	Intermediate Level	Free	No	6.5
JavaScript: Understanding the Weird Parts	79612	All Levels	Paid	No	11.5
Pianoforall - Incredible New Way To Learn Piano & Keyboard	75499	Beginner Level	Paid	No	30
Angular 4 (formerly Angular 2) - The Complete Guide	73783	Beginner Level	Paid	No	22
Beginner Photoshop to HTML5 and CSS3	73110	All Levels	Free	No	2
Web Development By Doing: HTML / CSS From Scratch	72932	All Levels	Free	No	1
HTML and CSS for Beginners - Build a Website & Launch ONLINE	70773	All Levels	Free	No	6
Become a Web Developer from Scratch	69186	All Levels	Paid	No	27.5
Bitcoin or How I Learned to Stop Worrying and Love Crypto	65576	All Levels	Free	No	8
Quickstart AngularJS	64128	Beginner Level	Free	Yes	1.5
Learn Responsive Web Development from Scratch	59639	All Levels	Free	No	4.5
Learn and Understand AngularJS	59361	Beginner Level	Paid	No	7

- a. Learn HTML5 Programming From Scratch has 268923 subscribers making it the highest subscribed course items of subscriber number. This is followed by Coding for Entrepreneurs Basic with 161029 subscribers and at third position is The Web Developer Bootcamp with 121584 subscribers.
- b. The Web Developer Bootcamp is ranked first when it comes to Paid and subscriber numbers, this is followed by The Complete Web Developer Course 2.0 while JavaScript: Understanding the Weird Parts is ranked third.
- c. Only 2 beginner courses are featured in the top 20 most popular courses, there are a. Learn HTML5 Programming From Scratch and Quickstart AngularJS.
- d. The 3 courses with the highest content duration within the 20 most popular courses are The Web Developer Bootcamp (43hrs), The Complete Web Developer Course 2.0 (30.5hrs) and Pianoforall Incredible New Way To Learn Piano & Keyboard (30hrs).
- e. A total of 8 Paid courses and 12 free courses were ranked amongst the 20 most popular courses.
- f. A total of 11 All Levels courses, 7 Beginner Level courses, 1 Intermediate Level course and 1 Expert Level course are among the 20 most popular courses.
- g. Wed Development subject had the highest number of courses within the 20 most popular courses with 17 courses, while Musical instruments had 2 courses and Business Finance has only 1 course.

6. Does content duration impact the price of the course?



a. There is no relationship between course content duration and how the course is priced, hence content duration does not impact the price of the course.

Summary of Findings

• Top 5 courses:

Almost 68% of subscribers come from Web Development and the top 5 courses are for Web development as well. 60% of this top 5 courses are beginner level and also 60% of this top 5 courses are free courses.

Business Finance vs Web Development:

Business Finance and web development have almost equal number of total courses (1155 vs 1203), but web development course are almost 2x in content duration and have 4x the average subscribers.

• Course Pricing:

Course pricing has no impact on course content, hence there is no relationship between course pricing and course content. Web development intermediate level courses accounted for the highest average price tag in web development subjects, while its expert level courses accounted for the lowest average price tag. This clearly show no relationship between pricing and course levels.

• Worst performing subject:

Musical instruments ranked lowest in all these measurement indices: total number of subscribers, average course content duration and average course pricing.

Actions & Recommendations

Product recommendations:

- ✓ Focus on getting more paid course by creators in Business
 Finance and Graphic design.
- ✓ Conduct a survey to know what kind of courses musical instrument subscribers and prospective subscriber would love.

Marketing recommendations:

✓ Our data tells us that our web development courses are most popular and people are willing to pay for it. Marketing and advertising campaigns should therefore intensify their strategies and focus on Business Finance, Graphic design and Musical Instruments. In doing so, should put Web development in the front burner.

Capstone Project: Google Play Store Apps

Project Description

Google Play Store is a digital distribution service operated and developed by Google. It serves as the official app store for certified devices running on the Android operating system and its derivatives, as well as ChromeOS, allowing users to browse and download applications developed with the Android software development kit (SDK) and published through Google. Google Play also serves as a digital media store, offering games, music, books, movies, and television programs. Applications are available through Google Play either for free or at a cost.

Google Management wants to have a better insight on the factors that moves the Android APP market as well as identify its trends and patterns. This they wish to achieve this via careful analysis of the datasets from their Android APP market operations. This will help them to improve on their strategies and chart a better direction for the organisation in their Android APP market.

Secondly, making use of the outcome of the analysis of the same datasets they will help Android APP developers to:

- a. Focus on APP categories and customer groups that are under served.
- b. Improve contents in areas APP reviews were not favourable.
- c. Explore opportunities in potential customer group that has the capacity to pay for APPs.

The Problem

Seven key questions were formulated in order to better understand the problems and help to better collate the data gathered in its best useful formations. These seven key questions are:

- 1. What are the top 5 most installed APPs Categories?
- 2. What is the bottom 5 least installed APPs Categories?
- 3. Is there any relationship between the averages of APP rating to APP installs?
- 4. Is there any relationship between category and Content Rating?
- 5. What are the average installs, average price and average size? Does APP size have any impact on price, Installs and Content Rating?
- 6. What is the Free and Paid APP relationship with Content Rating?
- 7. What are the APP users review distribution?

Data Design

The dataset of google play store APP market to be used to gain insight on the factors that moves the Android APP market as well as identify its trends and patterns was provided;

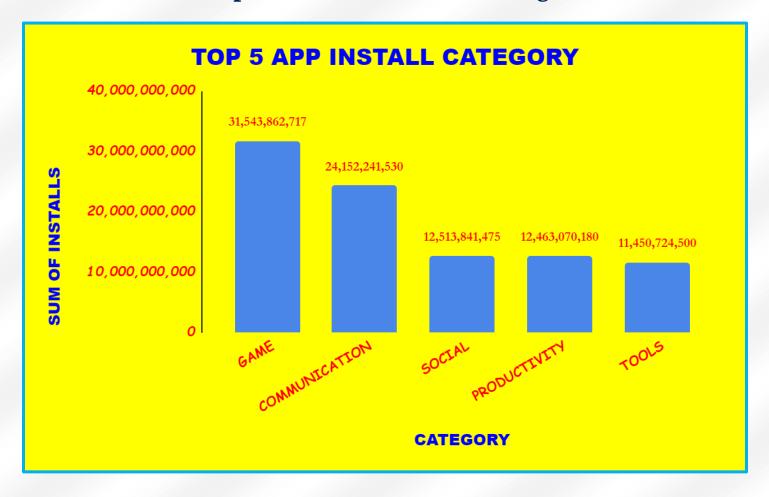
Two datasets were supplied in different sheets of an excel workbook. These datasets could not be consolidated into a sheet in the google workbook as their parameters were not the same.

The two datasets were cleaned independently by removing duplicate data, incomplete data and inconsistent or inaccurate data. This data cleaning process ensured that the dataset is accurate and ready for analysis.

Data analytic tools were deployed to analyze the datasets based on the seven key questions that was formulated. These are but not limited to; Pivot table, Function (SUM, AVERAGE, COUNTA, COUNT, MAX, etc.), Find & Replace.

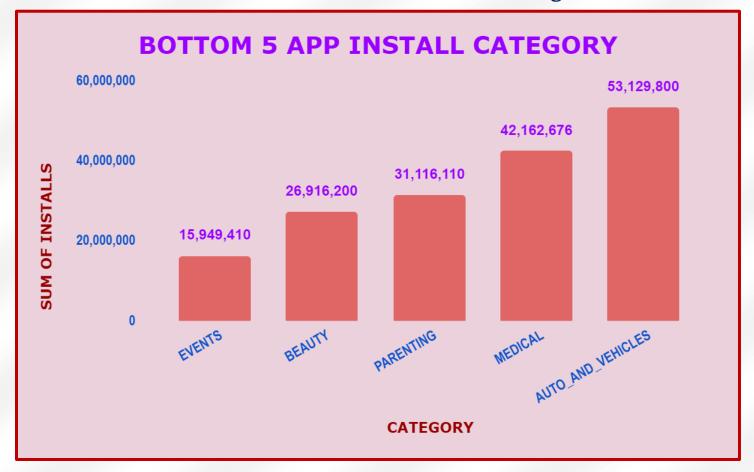
Data visualization of the analyzed dataset was then carried out. Data Visualization helped to highlight the most relevant insights, and spot patterns, trends, and outliers. Data Visualization is about presenting data in visual formats, such as graphs, charts, etc.

1. What are the top 5 most installed APPs Categories?



- a. The five top most installed APP Categories are Game (1st), Communication (2nd), Social (3rd), Productivity (4th) and Tools (5th).
- b. The top 5 most installed APP category accounted for 62.83% of the total for all the 33 APP Categories.
- c. Game APPs accounted for 21.51% of all the 33 APP
 Categories and 34.24% of the top 5 most installed APP
 Category.

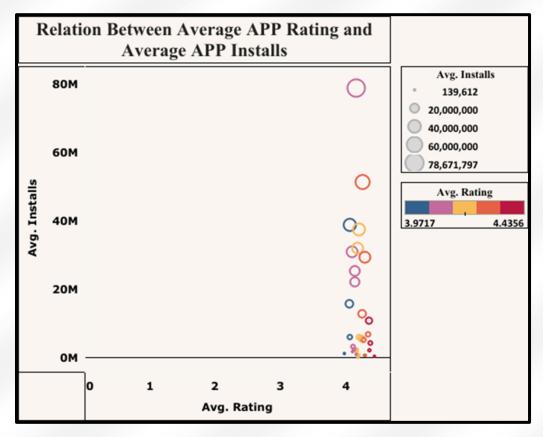
2. What is the bottom 5 least installed APPs Categories?



- a. The five bottom least installed APP Categories are Events, Beauty, Parenting, Medical and Auto_And_Vehicles.
- b. The bottom 5 least installed APP Category accounted for 0.12% of the total for all the 33 APP Categories.
- c. Events APPs accounted for 0.01% of all the 33 APP Categories and 9.42% of the bottom 5 least installed APP Category.

3. Is there any relationship between the averages of APP rating to APP installs?

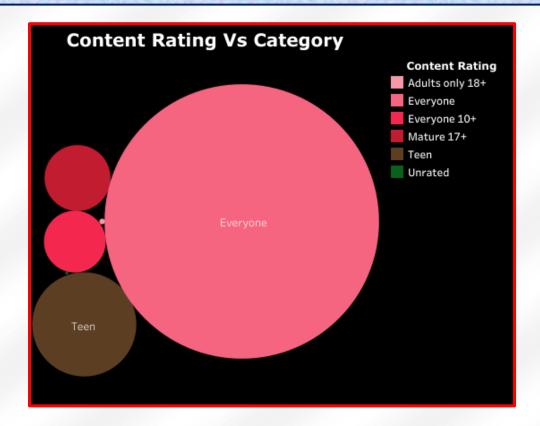
CATEGORY	AVERAGE OF RATING	AVERAGE OF INSTALLS	
ART_AND_DESIGN	4.36	2,003,760	
AUTO_AND_VEHICLES	4.19	727,805	
BEAUTY	4.28	640,862	
BOOKS_AND_REFERENCE	4.35	10,826,507	
BUSINESS	4.10	3,198,215	
COMICS	4.16	966,140	
COMMUNICATION	4.15	78,671,797	
DATING	3.97	1,298,883	
EDUCATION	4.38	4,138,388	
ENTERTAINMENT	4.14	22,123,063	
EVENTS	4.44	354,431	
FAMILY	4.19	5,844,663	
FINANCE	4.13	2,430,008	
FOOD_AND_DRINK	4.16	2,431,866	
GAME	4.28	29,370,449	
HEALTH_AND_FITNESS	4.26	5,194,680	
HOUSE_AND_HOME	4.16	1,839,441	
LIBRARIES_AND_DEMO	4.18	954,422	
LIFESTYLE	4.10	1,753,250	
MAPS_AND_NAVIGATION	4.05	5,840,867	
MEDICAL	4.18	139,612	
NEWS_AND_MAGAZINES	4.13	25,201,452	
PARENTING	4.30	622,322	
PERSONALIZATION	4.33	6,734,876	
PHOTOGRAPHY	4.18	31,977,773	
PRODUCTIVITY	4.20	37,314,581	
SHOPPING	4.25	12,739,265	
SOCIAL	4.25	51,286,236	
SPORTS	4.23	5,344,516	
TOOLS	4.05	15,600,442	
TRAVEL_AND_LOCAL	4.09	31,033,460	
VIDEO_PLAYERS	4.06	38,886,858	
WEATHER	4.24	5,681,287	



- a. The average APP rating ranged from 3.97 to 4.44, while the average APP Installs ranged from 139,612 to 78,671,797.
- b. Events APP Category which is the least installed had the highest average rating of 4.44, while Dating APP Category had the least average rating of 3.97.
- c. Communication APP Category which is the 2nd most installed had the highest average Installs of 78,671,797, while Medical APP Category had the least average Installs of 139,612.
- d. There is no correlation between average Rating and average Installs of APP Categories.

4. Is there any relationship between category and Content Rating?

Category	Adults only 18+	Everyone	Everyone 10+	Mature 17+	Teen	Unrated	Grand Total
ART_AND_DESIGN		58	1		3		62
AUTO_AND_VEHICLES		71	1		1		73
BEAUTY		39		1	2		42
BOOKS_AND_REFERENCE		149	5	3	20		177
BUSINESS		266			4		270
COMICS	2	25	2	7	22		58
COMMUNICATION		275		9	23		307
DATING		7		148	4		159
EDUCATION		120	5	3	1		129
ENTERTAINMENT		37	2	6	66		111
EVENTS		36	2		7		45
FAMILY		1307	125	44	242		1718
FINANCE		313			4		317
FOOD_AND_DRINK		97	2		7		106
GAME		556	127	72	319		1074
HEALTH_AND_FITNESS		235	5	6	16		262
HOUSE_AND_HOME		66			2		68
LIBRARIES_AND_DEMO		64					64
LIFESTYLE		274	5	9	17		305
MAPS_AND_NAVIGATION		121		1	2		124
MEDICAL		288	7	4	3		302
NEWS_AND_MAGAZINES		124	49	12	29		214
PARENTING		48		1	1		50
PERSONALIZATION		269	5	8	26		308
PHOTOGRAPHY		289		4	11		304
PRODUCTIVITY		330	1	1	2		334
SHOPPING		162		3	37		202
SOCIAL		82	2	58	102		244
SPORTS	1	255	11	6	13		286
TOOLS		727		1	5	1	734
TRAVEL_AND_LOCAL		199		1	5		205
VIDEO_PLAYERS		132	2	2	24		160
WEATHER		71	1	1	2		75
Grand Total	3	7092	360	411	1022	1	8889



- a. EVERYONE has 79.78% penetration in the APP

 Categories and the only Content rating that is captured in all the 33 APP Categories.
- b. Unrated is only captured in TOOLS APP Category with only 1 APP and ADULT 18+ has only 3 APP in 2 APP Categories. These 2-content rating are the least captured by Android APP developers.
- c. TEEN, MATURE 17+ & ADULT 18+ all capture 17yrs 19yrs age bracket.
- d. There is no correlation between APP Category and Content Rating.

5. What are the average installs, average price and average size? Does APP size have any impact on price, Installs and Content Rating?

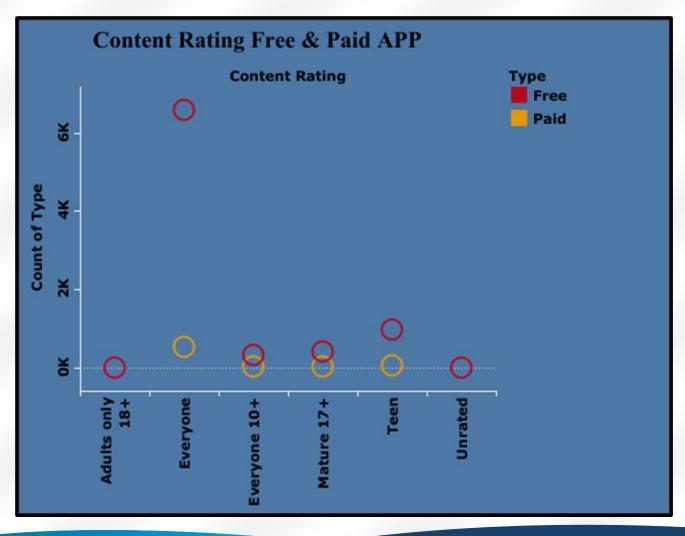
Content Rating	Average of Size_in_Mb	Average of Installs	Average of Price
Adults only 18+	22.95	666,667	\$0.00
Everyone	20.09	14,131,856	\$1.08
Everyone 10+	41.17	31,086,514	\$0.41
Mature 17+	26.94	10,439,325	\$0.25
Teen	33.54	30,252,502	\$0.61
Unrated	6.40	50,000	\$0.00



- a. EVERYONE 10+ content Rating had the highest average APP Size (41.17Mb) as well as the highest average APP Installs (31,086,514), but 3rd highest average APP Price (\$0.41).
- b. TEEN content Rating had the 2nd highest average APP Size (33.54Mb), 2nd highest average APP Installs (30,252,502), and 2nd highest average APP Price (\$0.61).
- c. EVERYONE content Rating had the 2nd the least average APP Size (20.09Mb), 3nd highest average APP Installs (14,131,856), and the highest average APP Price (\$1.08).
- d. APP Size has no impact on Price, Installs and Content Rating.

6. What is the Free and Paid APP relationship with Content Rating?

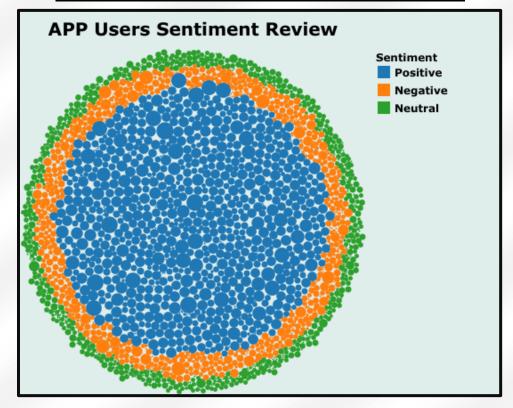
Content Rating	Free	Paid
Adults only 18+	3	0
Everyone	6573	519
Everyone 10+	328	32
Mature 17+	395	16
Teen	977	45
Unrated	1	0
Grand Total	8277	612



- a. Free APPs accounted for 93.12%, while Paid APPs accounted for 6.88%.
- b. EVERYONE content Rating had the highest number of APPs both in Free (6573) this accounted for 79.41% of total Free APPs and Paid (519) accounted for 84.80% of total Paid APPs.
- c. Adult 18+ and Unrated Content Rating had no APP in the Paid APP Type. The two also had the lowest of 2 APPs and 1 APP respectively in the Free APP Type.
- d. There is no clearcut relationship between Free & Paid APPS with Content Rating.

7. What are the APP users review distribution?

Sentiment	COUNTA of APP
Negative	6321
Neutral	4358
Positive	18965
Grand Total	29644



- a. APP Users Reviews distribution were spread thus:
 - Positive Sentiment 18,965 (63.98%)
 - Negative Sentiment 6,329 (21.32%)
 - Neutral Sentiment 4,358 (14.70%)

Summary of Findings

♣ Top 5 APPs:

Game, Communication, Social, Productivity and Tools are the top 5 most installed APP categories. The top 5 most installed APPs account for 62.83% of the total APP installs, with Game Category recording 21.51% of the total APP installs.

♣ Bottom 5 APPs:

Events, Beauty, Parenting, Medical and Auto_And_Vehicles are the 5 least installed APP categories. This 5 Categories account for 0.12% of the total APP installs.

Relation Between Average APP rating to average APP Installs:

There is no relationship between the average rating of APP category to its install sum average. Social category had the highest average installs (51, 286,236) with 4.25 rating while Events category had the highest average rating of 4.44 with 354,431 average installs.

♣ Relation Between Category and Content rating:

We have a total of 33 APP categories with 8889 APPs and 6 content ratings. Everyone is the only content rating that is represented across the 33 Categories with the highest representation of 79.78% of the total APPs. Teen comes second with 11.50% representation of the total APPs. Adult Only 18+ and Unrated are the bottom two content ratings (3 & 1 APPs respectively). Family APP Category has the highest number of APPs (1718) followed by Game with 1074 APPs and Tools with 734 APPs in the third position. TEEN, MATURE 17+ & ADULT 18+ all capture 17yrs -19yrs age bracket

There is no correlation between Category and Content Rating.

Summary of Findings

♣ Content Rating, APP price, APP Installs and APP size:

Everyone 10+ has the highest average APP size (41.17MB), highest average APP Installs (31,086,514) and the third highest average APP price (\$0.41). Teen had the second highest APP size (33.54MB), second highest APP Installs (30,252,502) and the second highest APP price (\$0.61). Everyone had the highest average APP price at \$1.08. APP size has no impact on APP price nor APP Installs nor Content Rating.

Content Rating Free and Paid APP:

We had a total of 8277 Free APPs as against 612 Paid APPs. Everyone Content Rating had the highest Free APP 6573 (79.41%) and highest Paid APP 519 (84.80%). Teen Content rating had the second highest Free APP 977 (11.80%) and the second highest Paid APP 45 (0.07%). Free APP to Paid APP ratio is 1.35: 14.52. Everyone 10+ had the best Free APP to Paid APP ratio of 1.10: 11.25, this is followed by Everyone with 1.08: 13.66.

APP Users Review Distribution:

We had a total of 29, 644 user reviews of 864 APPs. Positive user reviews totaled 18,965 (63.98%), Negative user reviews totaled 6321 (21.32%) while user neutral reviews totaled 4,358 (14.70%).

Actions & Recommendations

APP Market Development Recommendations:

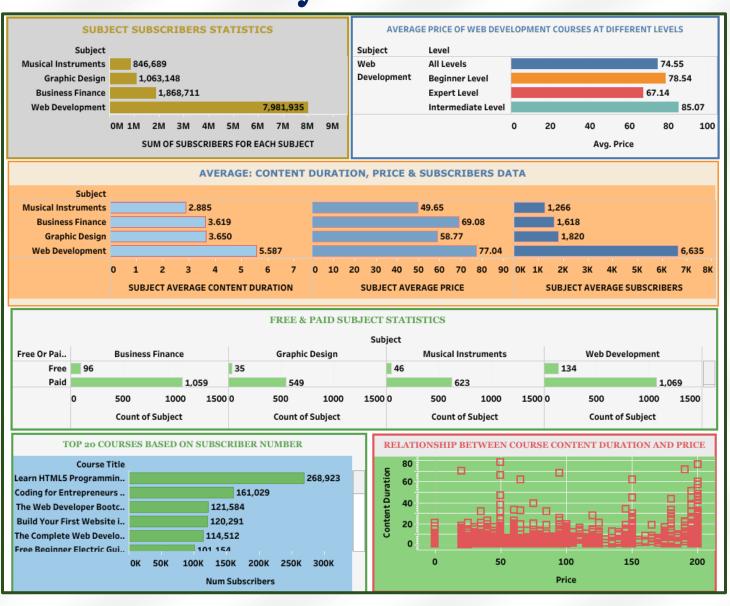
- ❖ Android APP developers to focus on rolling out more APPs in these categories: ART_AND_DESIGN, AUTO_AND_VEHICLES, BEAUTY, COMICS, EVENTS, HOUSE_AND_HOME, LIBRARIES_AND_DEMO, PARENTING and WEATHER.
- Android APP developers to focus on increasing the Paid APP numbers in these Content Rating classes: Everyone 10+, Everyone, Teen and Mature 17+.
- * Android APP developers to vigorously work towards increasing Free APP numbers in all the APP Categories for Adult Only 18+ and Unrated content Ratings.

APP Reviews Recommendations:

- * Android APP developers should go through Negative users' reviews digest their concerns, improve on the APP and chart a better User experience.
- ❖ Google's Management to review these three Content Rating (Teen, Mature 17+ & Adult 18+), with a view of having solving the overlapping age range.
- ❖ Conduct a survey to unravel the true position of Neutral users' reviews.

Appendix

Udemy Dashboard



Appendix

Google Play Store Dashboard

