

Financial analysis Twitter, Inc.

Análisis financiero Twitter, Inc.

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Abstract

Twitter, born nine years ago, is one of those web applications that has transcended the borders of the network and has passed into everyday life, is a global, public, real time platform, where any user can create a Tweet and any user can follow other users. The platform is unique in its simplicity; the tweets are limited to 140 characters of text. This limitation makes it easy for anyone to create, distribute and discover content and is optimized for mobile devices. The aim of this work is to base investment opportunities in the company, according to its stock market performance since the beginning of its operation based on performance and risk models.

Resumen

Twitter, nacida hace nueve años, es una de esas aplicaciones web que ha trascendido las fronteras de la red y ha pasado a la vida cotidiana, es una plataforma global, pública, en tiempo real, donde cualquier usuario puede crear un Tweet y cualquier usuario puede seguir a otros usuarios. La plataforma es única en su simplicidad; los tweets están limitados a 140 caracteres de texto. Esta limitación facilita que cualquiera pueda crear, distribuir y descubrir contenidos, y está optimizada para dispositivos móviles. El objetivo de este trabajo es fundamentar las oportunidades de inversión en la empresa, en función de su comportamiento bursátil desde el inicio de su actividad en base a modelos de rendimiento y riesgo.

Twitter, Tweet, Microbloging, Model risk

Twitter, Tweet, Microbloging, Modelo de riesgo

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Introduction

The objective of this article is to determine the feasibility of investing in Twitter Inc. considering its financial performance since the beginning of its operations and based on risk and return models.

The company was founded on March 21, 2006, its founders were Evan Williams, Noah Glass, Jack Dorsey and Biz Stone, it has been listed on the New York Stock Exchange (NYSE) since November 6, 2013 under the ticker TWTR and on the Mexican Stock Exchange (BMV) since February 26, 2014.

It is based in San Francisco, California, United States and has been under the jurisdiction of Delaware since 2007.

On the first day of trading on the New York Stock Exchange (NYSE), the initial price of the 70 million shares it brought to market was 26 dollars per share, and it closed its debut with a 72.69 percent increase in the value of its shares, with a price of 44.90 dollars per share.

Financial analysis on the New York Stock Exchange (NYSE)

Since the beginning of its operations Twitter has had a significant drop in the value of its shares, experiencing the lowest value in its history of \$29.71 per share, which caused the resignation as of July 1, 2015 of Dick Costolo as CEO of Twitter, after a year in which some investors were calling for changes in the management of the company, since the growth of users had stagnated and the company had not achieved a good financial performance as shown in Figure 1.

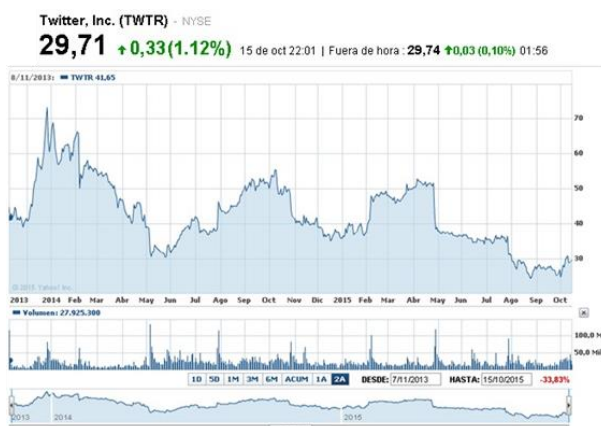


Figure 1 Twitter bursatility since inception of operations
 Source: (NYSE Oct 15, 2015)

It took only three months for entrepreneur Jack Dorsey to step down from his interim position, which now officially places him as Twitter's CEO.

The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 3.2), while Twitter shows a loss of 33.83 percent, its competitor, Twitter, has a 33.83 percent loss. The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 3.2), while Twitter shows a loss of 33.83 percent, its competitor.

The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 2), while Twitter shows a loss of 33.83 percent, its closest competitor LinkedIn shows a loss of 16.09 percent, followed by Google with gains of 18.82 percent and in the lead Facebook with gains of 93.86 percent.



Figure 2 Comparison of Twitter's most important competitors
 Source: (NYSE Oct 15, 2015)

The changes continue, less than a week after Dorsey returned to the presidency of the company and in an effort to revive the growth of that social network announces the layoff of 336 thousand employees, 8 percent of its worldwide workforce as part of a restructuring plan; a few days after the reduction in its workforce, it announces that former Google executive Omid Kordestani has been elected as the new executive chairman of the company's board of directors, noting that Kordestani is a "proven and experienced leader" who will "assist and teach" him and the entire management team directly as another important step in its restructuring plan.

The financial comparison shows that unlike its direct competitors, Twitter is the only one reporting a poor operating performance reporting a negative EBITDA of -285.91 Million dollars.

Comparación con el competidor directo					
	TWTR	LNKD	FB	GOOG	Sectores
Capitalización de mercado:	20,09MM	25,75MM	270,37MM	455,07MM	535,32Mill
Empleados:	4.100	8.735	10.955	57.148	314,00
Crecimiento de ingresos trimestral (interanual):	0,61	0,33	0,39	0,11	0,09
Ingresos (ttm):	1,78MM	2,56MM	14,64MM	69,61MM	110,04Mill
Margen bruto (ttm):	0,68	0,86	0,93	0,62	0,52
EBITDA (ttm):	-285,91Mill	216,68Mill	6,38MM	22,62MM	985,54Mill
Margen de explotación (ttm):	-0,30	-0,02	0,32	0,26	-0,01
Ingresos netos (ttm):	-599,92Mill	-111,56Mill	2,72MM	14,39MM	N/A
BPA (ttm):	-0,95	-0,89	0,98	21,22	N/A
Precio/Beneficio (P/E) (ttm):	N/A	N/A	97,52	31,18	30,29
PEG (estimado a 5 años):	1,29	2,29	1,61	1,31	1,19
Relación precio/ventas (P/S) (ttm):	11,04	9,93	18,10	6,41	6,83

Table 1 Comparison of Twitter is its direct competitors
Source: (NYSE Oct 15,2015)

Analysis based on Financial Engineering

Next, the company's performance will be analyzed from a Financial Engineering perspective based on risk and return models.

For modeling purposes, data from its trading on the Mexican Stock Exchange (BMV) on October 21, 2015 is considered.

The risk and return variables are as follows: Performance Variables

Variable	Description	Value
V_v	Sales Volume	20000
P_v	Selling position	490.61
V_c	Buy Volume	20000
P_c	Buy Bid	485.39
P^{Uh}	Last Done Price	491.61
V_o	Volume Traded	1241979
P_u	Price/Utility	0
P^{VL}	Price/Book Value	0
U_a	Profit for/Share	0
V^{La}	Book Value p/Share	0

Table 2 Performance Variables (BMV) for October 21, 2015

Risk variables

Variable	Description	Value
P_a^M	Maximum price	492
P_i^M	Min. price	475.5
MP_a^a	Max. Previous Year	744
MP_a^i	Min. Previous Year	391.36
PPP	PPP	0
V	Variation	-4.356031
Ac	Circulation Shares	654,774,000

Table 3 Risk Variables (BMV) as of October 21, 2015

Partitions

Variable	Description	Value
P_1	Partition 1	481.00
P_2	Partition 2	487.00
P_3	Partition 3	484.00
P_4	Partition 4	483.50
P_5	Partition 5	484.00
P_6	Partition 6	490.79
P_7	Partition 7	491.61

Table 4 Partitions (BMV) for October 21, 2015

Exchange Rate

Description	Value
TC -Fix	16.66
TC Interbank 48 hrs	16.57

Table 5 Bank of Mexico exchange rate as of October 21, 2015

Inflation index

Description	Value
CPI General Index	2.52
Underlying CPI	2.38
Non-core CPI	2.96

Table 6 Bank of Mexico Inflation Index for September 2015

Operations on October 21, 2015 show loss as shown in figure 3.

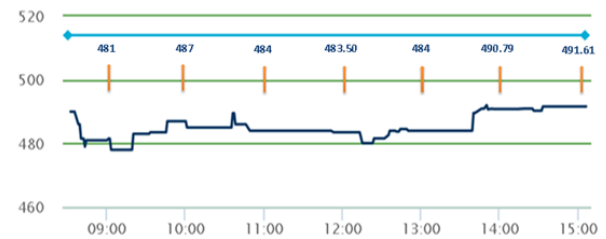


Figure 3 Stock Market Trend Graph
Source: (BMV Oct 21,2015)

Modeling under Stephen Turnovsky

Integral

$$\int_{lim^{-1}}^{lim^1} = \int_{lim^{-1}}^{lim^1} = \left[\frac{1(-1)}{lim} \right]^2 = \frac{(0)^2}{lim} = \sqrt{lim} = 0 = 0 \rightarrow \infty$$

$$\int_{lim^{-1}}^{lim^1} = 1$$

Differential

$$\frac{d}{dx} \cdot \frac{d}{dy} \cdot \frac{d}{dz} = \frac{d(x,y,z)}{dxyz} \therefore \frac{dx+dy+dz}{dx} + \frac{dy+dz+dx}{dy} + \frac{dx+dz+dy}{dz} \therefore \frac{d}{x \cdot y \cdot z} = -1$$

Partial

$$\partial \rightarrow \frac{\partial y}{\partial z} = \frac{\partial y}{\partial x} = \frac{\partial'}{\partial y} \cdot \frac{\partial''}{\partial z} = \left[\frac{\partial}{y \cdot z} \right]^2 = \frac{\sqrt{\partial}}{y \cdot z} = 0,5 \quad \therefore \frac{1}{2}$$

$$\partial \rightarrow \frac{\partial y}{\partial z} = \frac{1}{2}$$

Modeling

$$P = \frac{[V_y - P_y]^{1/2}}{V_0 - P_U} + \frac{3}{4} \left[\frac{(P^{VL})}{(P_U)} \right] \rightarrow J_{VL} = \frac{[20000 - 490.61]^{1/2}}{(1241979 - 491.61)} + \frac{3}{4} \left[\frac{0}{(0)} \right] \rightarrow J^0 = \frac{[19509.39]^{1/2}}{1241487.39} + \frac{3}{4} [1] + J^0$$

$$= \frac{139.68}{1241487.39} + \frac{3}{4} [1] + 1 = 1.11 \times 10^{-4} + \frac{3}{4} [1] + 1 = 0 + (0.75) + 1 = 1.75 = \frac{1.75 \times 100}{100} = 1.75\%$$

Call

$$C = \left[\frac{V_c - P_c}{\left[\frac{V_U}{P_U} \right]^{1/2}} \right]^2 + J^{VL} - [J^U + J]_{x \dots} = \left[\frac{20000 - 485.39}{\left[\frac{1241979}{491.61} \right]^{1/2}} \right]^2 + J^0 - [J^0 + J]_{x \dots}^{0+0}$$

Market Shares

$$= \left[\frac{20000 - 485.39}{\left[\frac{1241979}{491.61} \right]^{1/2}} \right]^2 + 1 - [1 + 1] = \left[\frac{20000 - 485.39}{\left[\frac{1241979}{491.61} \right]^{1/2}} \right]^2 + 1 - [2] = \left[\frac{19514.61}{12526.35} \right]^2 + 1 - [2]$$

$$= \left[\frac{19514.61}{150.36} \right]^2 - 1 = [388.27]^2 - 1 = 87.47 - 1 = 86.47 = \log(86.47) = 1.93 = \frac{1.93 \times 100}{100} = 1.93\%$$

CDO Turnovsky

$$PM = \frac{\frac{\partial [P_U + \partial P^{VL}]}{\partial P_U} + \left(\frac{\partial P_V}{\partial P_U} \right) - \left(\frac{\partial V_V - 1}{\partial V_C + 1} \right)}{J^0} = \frac{(0.5) \left[\frac{0 + (0.5)(0)}{491.61} \right] + \left(\frac{0.5(490.61)}{491.61} \right) - \left(\frac{0.5(20000 - 1)}{0.5(20000 + 1)} \right)}{\frac{1}{10(1241979)}} = \frac{(0.5) \left[\frac{0}{491.61} \right] + \left(\frac{245.30}{245.69} \right) - \left(\frac{10000 - 1}{10000 + 1} \right)}{\frac{1}{1241979}}$$

Exchange Rate

$$= \frac{(0.5) \left[\frac{0 + (0.5)(0)}{491.61} \right] + \left(\frac{0.5(490.61)}{491.61} \right) - \left(\frac{0.5(20000 - 1)}{0.5(20000 + 1)} \right)}{10(1241979)} = \frac{(0.5) \left[\frac{0}{491.61} \right] + \left(\frac{245.30}{245.69} \right) - \left(\frac{10000 - 1}{10000 + 1} \right)}{16.09}$$

$$= \frac{(0.5) \left[0 + \frac{1.01}{1.00} \right] - \left(\frac{0.99}{1.00} \right)}{16.09} = \frac{0 + 1.00 - (0.99)}{1} = \frac{0 + 1.00 - 0.99}{1} = \frac{0.01}{1} = 0.01 = \frac{0.01 \times 100}{100} = 0.01\%$$

$$PM = \underline{0.01\%}$$

Inflation

$$\pi = \frac{IPC}{IPC_0} = \left[\frac{2.96}{2.38} \right]^2 = [1.24]^2$$

$$\underline{\pi} = \underline{1.18}$$

Risk Model Integration

$$MRI = \frac{(AM)^{1-\pi}}{P-C} + \frac{Lim P_z - P_z}{PM} = \frac{(AM)^{1-\pi}}{P-C} + \frac{Log \frac{P_z}{P_y}}{PM}$$

Disaggregated Risk Model

$$MRI = \frac{\left\{ \left[\frac{P^U + P^M}{\left[\frac{P^U}{P^U} \right]^{1/2}} \right]^2 + \left[\frac{MP^U + M^U}{Ac} \right] + \xi^2 \right\} \left(\frac{DP-D_1}{3} \right) \left(\frac{IPC}{IPC_0} \right)^2}{\left\{ \frac{[V_y - P_y]^{1/2}}{V_0 - P_U} + \frac{3}{4} \left[\frac{(P^{VL})}{(P_U)} \right] - J_{VL}^0 \right\} - \left\{ \left[\frac{V_c - P_c}{\left[\frac{V_U}{P_U} \right]^{1/2}} \right]^2 + J^{VL} - [J^U + J]_{x \dots}^{0+0} \right\}} + \frac{Lim P_z - Lim P_z}{\frac{\partial [P_U + \partial P^{VL}]}{\partial P_U} + \left(\frac{\partial P_V}{\partial P_U} \right) - \left(\frac{\partial V_V - 1}{\partial V_C + 1} \right)}$$

$$= \frac{(2.00)^{1-1.18}}{0-07.46} + \frac{Log 481}{Ln 491.61} = \frac{(2.00)^{0.82}}{-07.46} + \frac{2.68}{0} = \frac{1}{-07.46} + \frac{0.43}{0} = -0.01 + 1.00 = 0.99 = \frac{0.99 \times 100}{100}$$

$$MRI = 0.99\%$$

Performance Model Integration

$$MRE = \frac{(AM)^{\pi}}{P-C} + PM J_{P_z}^2$$

Disaggregated Performance Model

$$MRE = \frac{\left\{ \left[\frac{P^U + P^M}{\left[\frac{P^U}{P^U} \right]^{1/2}} \right]^2 + \left[\frac{MP^U + M^U}{Ac} \right] + \xi^2 \right\} \left(\frac{DP-D_1}{3} \right) \left(\frac{IPC}{IPC_0} \right)^2}{\left(\frac{DP-D_1}{3} \right)} + \frac{\frac{\partial [P_U + \partial P^{VL}]}{\partial P_U} + \left(\frac{\partial P_V}{\partial P_U} \right) - \left(\frac{\partial V_V - 1}{\partial V_C + 1} \right)}{J^0} J_{P_z}^2$$

$$= \frac{(2.00)^{1-1.18}}{0-07.46} + 0.481/491.61 = \frac{(2.27)}{0} + 0 \frac{Log(481)}{Ln(491.61)} = \frac{(2.27)}{0} + 0 \frac{2.68}{6.19} = 1 + 0(0.43) = 1 = \frac{1 \times 100}{100}$$

$$MRE = 1\%$$

Risk vs. Return Model

$$MRR = \int_A^B + \frac{(lim C)^{\pi}}{(lim D)^{TC}} + \left[\frac{log B}{ln A} \right]^{3/4} + \frac{(lim D)^{TC}}{(lim C)^{\pi}} + \frac{ln A + log B}{C-D} + \xi^2$$

Disaggregated Risk vs. Return Model

$$MRR = \frac{\left\{ \left[\frac{P^U + P^M}{\left[\frac{P^U}{P^U} \right]^{1/2}} \right]^2 + \left[\frac{MP^U + M^U}{Ac} \right] + \xi^2 \right\} \left(\frac{DP-D_1}{3} \right) \left(\frac{IPC}{IPC_0} \right)^2}{\left(\frac{DP-D_1}{3} \right)} + \frac{\lim P_z - \lim P_z}{\frac{\partial [P_U + \partial P^{VL}]}{\partial P_U} + \left(\frac{\partial P_V}{\partial P_U} \right) - \left(\frac{\partial V_V - 1}{\partial V_C + 1} \right)}$$

$$MRR = \int_{-0.01}^1 + \frac{(lim 1)^{1.18}}{(lim 0)^{31.32}} + \left[\frac{log 1}{ln -0.01} \right]^{3/4} + \frac{(lim 0)^{31.32}}{(lim 1)^{1.18}} + \frac{ln(-0.01) + log 1}{1-0} + 1$$

CDO Turnovsky

$$= 1 + 1 = 2 = Log(2) = 0.30 = \frac{0.30 \times 100}{100}$$

$$MRR = 0.30\%$$

Analysis with Consulting and Financial Management Software

Reliability of the company

The logarithm of the partitions is constant, so it is determined that the company is financially solvent, given that its $R^2 = 0.0229$, which is < 0.5 , as shown in Figure 4.

Income level

	Variable	Valor	LOG
Máximo	P M/a	492	2.691965103
Mínimo	P M/i	475.5	2.677150521
Max Año	MP a/a	744	2.871572936
Anterior	MP i/a	391.36	2.592576435
Variación	V	-4.356031	NA
PPP	PPP	0	N/A
Acciones de Circulación	A c/	654,774,000	9
P1	09.00	481.00	2.68
P2	10.00	487.00	2.69
P3	11.00	484.00	2.68
P4	12.00	483.50	2.68
P5	13.00	484.00	2.68
P6	14.00	490.79	2.69
P7	15.00	491.61	2.69

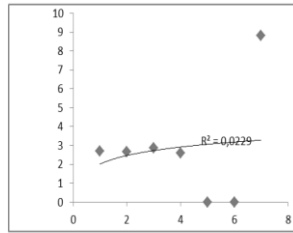


Figure 4 Logit values

Considering a sales volume of 20,000 and purchase volume of 20,000, it is determined that the company's net income is at risk with a negative income at -6.54% of its outstanding shares representing -\$4,282,221,960 pesos.

$$\text{Net income} = 654774000 \times (-6.54) = -\$4,282,221,960 \text{ pesos.}$$

Purchase Volume	Sales Volume	Outstanding Shares	Net Incomes
20000	20000	654774000	-6.54774E8
click to calculate			
Price Value in Book			3.0
0.5	1.0	0.5	click to calculate

Figure 5

Days with stock/holding item

The company has 296 days of trading, so its holding period is 69 days, equivalent to 2.3 months. If it exceeds this parameter it will have to pay a fine between \$72,025,140 and \$78,572,880. 78,572,880, which corresponds to the range between 11 and 12% of its capital, which is \$654,774,000 M.N.

Net Present Value (NPV)

SIM Annual rate = 48 % = 4 % * 12

Time limit = Time inicial + Operativity

Market-SIM = Time inicial * Val-Book * Asset

Activity	Operativity	Time inicial	Time limit	Val-Book * Asset
INICIO	0	8	8	.5
Proc A	460	16	476	1
Proc B	438	24	462	1.5
M1*	2.59	32	0	2
Proc C	3.908046	40	43.91	2.5
M2*	2.6	48	0	5
Proc D	744	56	800	3.5
Proc E	391.36	74	465.36	4
Final	0	0	0	4.5

Figure 6

The capital is 5%, the graph shows problems due to its sawtooth representation, which denotes that there is no continuity in the market.

Datos de Entrada		
Ac	Acciones en Circulación	654,774,000
L	Log (Ac)	8.81
N	Días tenedor	69
I	IPC no subyacente	2.96

Table 7

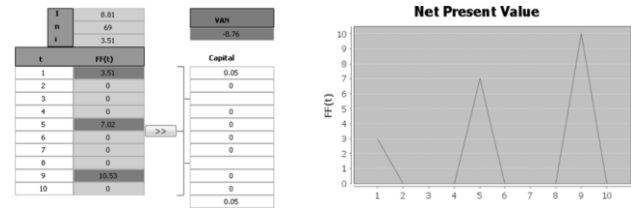


Figure 7

Internal Rate of Return (IRR)

The IRR is 1, the graph shows 2 cosines (loss) and 1 sine (gain), its absolute value is 1.

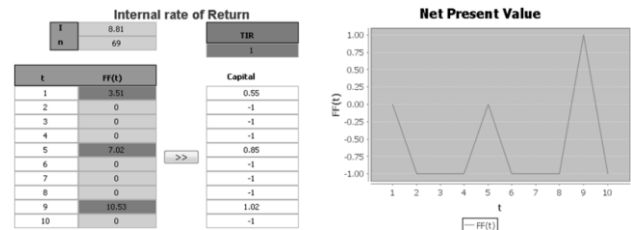


Figure 8

Acquisition Payout Ratio

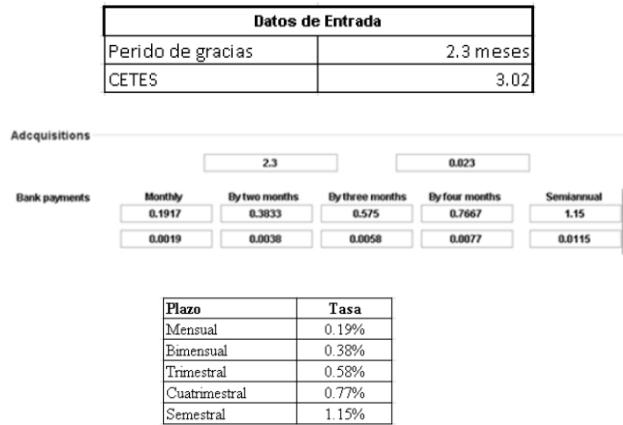


Table 8

Government subsidy rate financing frontier

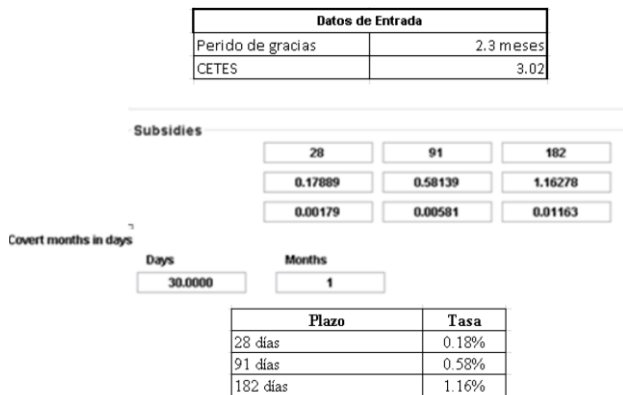


Figure 10

The maximum loan that can be granted to the company is 3 years.



Figure 11

Appendix

History

Twitter began as a research and development project within Obvious, LLC, a small San Francisco start-up, during March 2006.

The original name of the product was twttr, inspired by Flickr. It was initially used internally by the company until it was officially launched to the public in October of the same year. The service quickly began to gain followers and in March 2007 it won the South by Southwest Web Award in the blog category.

Jack Dorsey is the father of the web application and current Chairman of the Board of Twitter, Inc., a company that grew out of Obvious, LLC and the success of Twitter. At the beginning of 2008, the Twitter team consisted of 18 people, during 2009 they have quadrupled their staff and continue to grow.

Although Twitter was using advertising services such as Google's AdSense for a short time, they decided to discard advertising revenues until they had more users, financing themselves in the meantime with investments from venture capital firms. In September 2009, Twitter announced changes to its terms of service, leaving open the possibility of including advertising in its services. Twitter has more than 35 offices around the world.

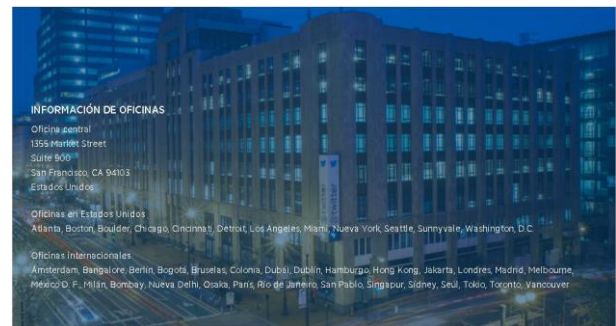


Figure 12

Source: <https://about.twitter.com/es/company>

Technology

The Twitter web interface is written in Ruby on Rails, and messages are maintained on a server that runs on software programmed in Scala and also has an open API for all types of developers, which is a great advantage for those who want to integrate Twitter as a service in other web applications as well as in desktop or mobile applications.

Ruby on Rails is basically an open source web application framework written in the Ruby programming language following the Model-View-Controller (MVC) paradigm.

Ruby on Rails technology tries to combine simplicity with the ability to develop real-world applications by writing less code than with other frameworks and with minimal configuration.

Twitter has been renewing its interface over the years and last September for both its website and mobile devices they launched version 5.0 which has been developed from scratch. New features include a new header image and better optimization of images for smartphones and tablets.

Business model

Twitter's business is quite simple and consists of 3 segments:

1. Users: the value proposition of Twitter consists of offering its critical mass of users microblogging services and the ability to keep up to date with what is happening in the world instantly through various channels such as its smartphone app, its website, and APIs that allow Twitter to be integrated into other websites. Twitter does not generate income directly from its users.
2. Companies: Taking advantage of the critical mass of existing users, and the information it has about them, Twitter offers advertising services to companies, which can show their advertising to those users most likely to buy products from those companies (Targeted Marketing). These marketing services include: promoted tweets (the advertiser pays to show the tweet to a defined segment of users), promoted accounts (the advertiser pays to acquire followers) and promoted trends (the advertiser pays to have more visibility as a "trending topic"). Twitter earns revenue from this customer segment.
3. Developers: Twitter also allows developers to connect to Twitter to generate tools related to web analytics, or other apps that help grow the critical mass of users that use Twitter.

This increases Twitter's revenues indirectly.

Twitter's business model is a bilateral business model, based on attracting users who generate activity and share information for its platform on the one hand, and attracting advertisers on the other, taking advantage of its platform and the information generated by its users to sell advertising services. In other words, Twitter acts as an intermediary, as if it were an advertising platform. Therefore, Twitter will be profitable to the extent that it is profitable for its advertisers.

Twitter needs the lifetime value of each user (Life Time Value) to be greater than its acquisition cost. It is as simple as that.

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