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GO FUND YOURSELVES! PREDICTING THE LIKELIHOOD OF OBTAINING CAPITAL THROUGH ONLINE CROWDFUNDING

Juan Carlos Barcelón, De La Salle University

John Gerald Dulay, De La Salle University

Josemaria Rustia, De La Salle University

Danica Camille Yu, De La Salle University

Patrick Adriel H. Aure, De La Salle University

Denver D. Daradar, De La Salle University

ABSTRACT

This study explores the various endogenous factors that affect the likelihood of obtaining required capital (LORC) for online crowdfunding platform projects in Kickstarter and The Spark Project. These factors include amount of capital required, campaign length, currency, Facebook connectivity, month of launch, number of FAQs, number of images, number of reward levels, number of updates, number of videos, and product market category. Based on a dataset sample of 400 projects for Kickstarter (95% confidence level) and dataset of 63 projects for The Spark Project (100%) confidence, the researchers conducted linear discriminant analysis and binary logistic regression. The researchers also interviewed three respondents who have had firsthand experience with online crowdfunding. Based on a cross analysis, the results showed that in Kickstarter, the following variables are conclusively significant to LORC: amount of capital required, campaign length, number of images, and number of videos. On the other hand, only amount of capital required was conclusively significant in The Spark Project.

In the Philippines, entrepreneurs face multiple challenges to receiving the funding they need from traditional methods. Because of this, many great ideas and profitable ventures fall short even before they could begin. This hampers the innovative environment of the country and makes it harder for the common enterprising Filipino to alleviate their economic challenges and attain their dreams.

Given this, rewards-based online crowdfunding has a strong potential to uplift the entrepreneurial ecosystem of the Philippines and to help struggling entrepreneurs by serving as an easy-to-access and viable alternative source of startup capital. Online crowdfunding is a recent phenomenon wherein entities (i.e. project creators) seek funding for their projects by appealing to large groups of people (i.e. potential backers) who provide smaller contributions in order to obtain larger capital within a given period of time. Due to its open and accessible nature, even the most marginalized members of society can benefit from this avenue.

Multiple endogenous factors (i.e. features of the campaign) affect a crowdfunding project's likelihood of obtaining required capital (LORC). Based on various studies, the researchers decided to look into the following variables: amount of capital required, campaign

length, currency, Facebook connectivity, month of launch, number of FAQs, number of images, number of reward levels, number of updates, number of videos, and product market category.

Using linear discriminant analysis, the researchers found that currency has a discriminating power towards global platforms, while number of FAQs and month of launch have a discriminating power towards local platforms. Likewise, using logistic regression, the researchers found that amount of capital required, number of FAQs, number of updates, and product market category are highly significant ($\alpha = 0.01$) under global platforms (i.e. represented by Kickstarter). In local platforms (i.e. represented by The Spark Project), none of the variables were highly significant, but amount of capital required was very significant ($\alpha = 0.05$).

The study also takes into account the insights of three key stakeholders who had firsthand experience with online crowdfunding, particularly in Kickstarter and/or The Spark Project. All three respondents gave insights on each of the variables, identifying some with significant impact on LORC. For Kickstarter, all three agreed that amount of capital required, campaign length, number of images, and number of videos are significant. For The Spark Project, all three concurred that amount of capital required, Facebook connectivity, number of videos, and product market category have significant impact. They also identified three new variables: story, crowd, and product.

With such insights, this study may help aspiring entrepreneurs in the Philippines launch projects successfully through online crowdfunding. The researchers developed a machine learning program based on the results of the statistical analysis of this study, which will be turned into an application that determines the likelihood of a project's success at obtaining LORC and its suitability in local or global platforms based on project features inputted by the user. This will be released as a product for entrepreneurs as a means of helping them plan their project campaigns for success should they set out to access online crowdfunding.

Keywords: Crowdfunding, LORC, endogenous factors, project campaign, project creators, backers, Kickstarter, The Spark Project

INTRODUCTION

Crowdfunding is the “financing of a project by a group of individuals (collectively, ‘the crowd’) instead of professional ‘accredited’ entities or individuals such as banks, venture capitalists or business angels” (Mitra, 2012, p. 67). As globalization accelerates the e-commerce industry, it is becoming easier to access countless resources online. The most common methods of attaining capital funding have been through equity and debt, but online crowdfunding has made its niche by providing unique attributes that traditional methods do not have (Beier & Wagner, 2015). Many entrepreneurs are unable to access traditional methods due to a lack of credit rating, low starting capital, the need for collateral, and stringent requirements. Furthermore, it is often difficult to convince a few investors to invest large amounts of money, especially for novel and innovative ideas. In the Philippines, these issues are very apparent, compounded by the fact that the economy is predominantly impoverished.

Online crowdfunding has the potential to address all these issues and to help entrepreneurs. The avenue does not have stringent requirements. It is easily accessible through

the internet. It does not rely on a few large investors, but rather, on small investments made by many investors. It has a free and convenient marketing system, and promotes novel and innovative ideas. It also encourages the promotion of social causes, allowing marginalized members to benefit from the contributions of many in an effort similar to social enterprises.

Nonetheless, online crowdfunding is not perfect, and projects are prone to fail if they are not managed correctly. As such, this study seeks to gain a better understanding of how certain features (i.e. endogenous variables; crowdfunding campaign elements) impact a project's likelihood of obtaining the capital amount it needs.

Before proceeding, an important term to consider is the likelihood of obtaining required capital (LORC). This refers to how likely a project will successfully reach its capital target within its campaign period.

In this study, the researchers set out to answer the following **research questions**:

What is the likelihood that a crowdfunding campaign would best be suited for global or local crowdfunding platforms, given the following factors:

Amount of Capital Required

Campaign Length (*for Kickstarter only*)

Currency (*for Kickstarter only*)

Facebook Connectivity

Month of Launch

Number of FAQs

Number of Images

Number of Reward Levels

Number of Updates

Number of Videos

Product Market Category

Considering the case of a global and a local platform, what are the odds that the likelihood of attaining its required amount of capital would increase or decrease given the following variables:

See the 11 variables listed in Research Question 1

To what extent do the discriminant functions used in this study provide an accurate representation of the predicted group membership of crowdfunding projects within global and local crowdfunding platforms?

To what extent do the logit link functions used in this study provide an accurate representation of the relationship between the endogenous factors and the likelihood of attaining the required amount of capital?

From a qualitative standpoint, what factors contribute most prominently to the success of crowdfunding projects at attaining their capital targets in global and local crowdfunding platforms? How do these factors contribute to such success?

Furthermore, the researchers fulfilled the following **research objectives**:

To ascertain which endogenous factors affect the likelihood of crowdfunding projects being grouped in either global or local crowdfunding platforms, and to what extent these factors do so

To determine which endogenous variables, affect the likelihood of crowdfunding projects obtaining their required amount of capital in global and local crowdfunding platforms, and to what extent these variables do so

To determine the statistical significance between the relationships mentioned in the first two objectives, and the goodness of fit for the models used in this study

To create a predictive machine learning model using linear discriminant algorithms and logistic regression algorithms that would enable crowdfunding project creators to know the likelihood of attaining their required amount of capital, and to determine whether global or local platforms are more appropriate based on the characteristics of their projects

To determine how and why such significant endogenous variables affect the likelihood of crowdfunding projects obtaining their required amount of capital, through the insights derived from a qualitative in-depth interview

In the succeeding table, the **hypotheses of the study** are listed and detailed:

Table 1
Hypothesized Relationship of Endogenous Variables

Variable	Label	Expected Sign	Alternative Hypothesis	Null Hypothesis
			(H _A)	(H ₀)
Amount of Capital Required	X _{CAP}	Positive	The variable increases the LORC of an online crowdfunding project campaign	The variable <i>does not</i> increase the LORC of an online crowdfunding project campaign
Campaign Length	X _{LEN}	Positive		
Currency	X _{CUR}	Positive		
Facebook Connectivity	X _{FBC}	Positive		
Month of Launch	X _{MON}	Positive		
Number of FAQs	X _{FAQ}	Positive		
Number of Images	X _{IMG}	Positive		
Number of Reward Levels	X _{RWD}	Positive		
Number of Updates	X _{UPD}	Positive		
Number of Videos	X _{VID}	Positive		
Product Market Category	X _{CAT}	Positive		

Likewise, the study considers two *a priori propositions* for its qualitative analysis:

Proposition 1: There are select factors (i.e. those identified in the related literature and the research questions of this study) that affect the likelihood of obtaining the required capital for crowdfunding projects, for local and international crowdfunding platforms.

Proposition 2: There are other factors (i.e. those not identified in the related literature and the research questions of this study) that affect the likelihood of obtaining the required capital for crowdfunding projects.

Furthermore, the study takes into account several **limitations**:

Study only covers rewards-based crowdfunding projects

Study only samples Kickstarter and The Spark Project

The study considers aggregate data due to lack of access to time series data

The statistical results for Kickstarter have a 95% confidence level

Only three respondents were considered, for purposes of accessibility and focus

The study does not specifically look into other possible factors beyond the eleven listed out, although it does employ a stochastic error term in its statistical analysis

REVIEW OF RELATED LITERATURE

Research has shown that financing in the Philippines, especially by SMEs, has proven to be difficult. SMEs become risky and costly as they face the following challenges and limitations that make it difficult for them to even reach banking standards: poor credit history, limited track record, lack of credit info, limited acceptable collateral, unstable business type/environment, limitations in financial and management capabilities, and lack of familiarity with SME business environment (Aldaba, 2012). The Philippines has enough resources to assist in funding SMEs but difficult processes, requirements and regulations make it difficult to do so. Therefore, the lack of access to financing is observed to be the most difficult constraint to SME growth (Aldaba, 2012; Ibrahim, 2015).

With this financial problem the concept of crowdfunding has become ever-more significant. Schwienbacher & Larralde (2010) described it as an innovative and relatively new method for funding a variety of new ventures whether for-profit, cultural, or social projects through the financial support of many individuals, usually in exchange for future products or equity. Projects range greatly in terms of goals & magnitude from small artistic ones to large-scale businesses. Further studies also show the benefits of the model of crowdfunding in various forms such as traditional approach streamlines with acquiring capital made is made easier by providing the economy more opportunities to grow at a faster rate. Moreover, larger audiences are reached as through the internet, online crowdfunding becomes an internal hub for entrepreneurs and potential investors to interact. Startup creation is also made efficient, from the introduction of a product or service to the PR and Marketing, and to its payment processing scheme. And with its unique model, it not only holistically prepares startups by looking at every angle of the business, but also crowdfunding has ingenuity at its score. It provides excellent opportunities for refinement of products/services; its success largely boils down to its purpose, innovation, and demand in the market (Garecht, n.d.; Jenik et al., 2017; Kraus et al., 2016; Mollick, 2014; The World Bank, 2013)

Table 2
Review of Related Literature – Main Findings and Insights

Main Author/s (Year)	Topic/Variable considered	Relevant Insights and Findings
Mollick (2014)	Endogenous factors: Amount of Capital Required	Likely backers lean towards projects that provide them a higher sense of security in terms of investments.
Pappaioannou, 2006; Patnaik, et. al., 2015	Endogenous factors: Currency	Crowdfunding projects can reap potential hedge benefits but also face risks that come because of fluctuations in the foreign exchange market.
Cumming, et. al., 2015; Crossetto & Regner, 2014; An et. al., 2014	Endogenous factors: Number of Reward Levels	Backers have a positive perception of certain types of rewards, particularly product-oriented rewards. <i>Number of reward levels</i> also affect their perception.
Canada Media Fund (2015)	Endogenous factors: Campaign Length	The right length of time is essential to the success of a campaign. The optimal length for a campaign is 45 days.
Liu, et al. (2010); Canada Media Fund (2017)	Endogenous factors: Product Market Category	Product market categorization allows the segregation of a “heterogeneous market” into a group of “smaller homogeneous markets”. This addresses different demands and product preferences that may positively affect campaign’s promotion under certain circumstances. The Canada Media Fund reveals the following findings in terms of success rates at Kickstarter: Games (35%), Film (40%), Dance (71%), Theater (64%), and Music (55%). These suggest that certain market categories are more successful than other market categories and could suggest a correlation.
Beier & Wagner, (2015); Kerkhof, (2016)	Endogenous factors: Facebook Connectivity	Social capital is a very important tool for marketing crowdfunding projects, since having a strong social network aids in the marketing of a project. Through Facebook, project creators can reveal their project, market their product, and have constant interaction with the potential backers.
Daniele & Gangi (2017); Kerkhof (2016); Mollick (2014)	Endogenous factors: Updates	Updates serve as a means for project creators to communicate with backers. Furthermore, they send out “quality signals” to backers, assuring them that their investment going through progress in a quality product.

Shane and Cable, (2002); Chen, et al., (2015)	Endogenous factors: FAQs	Information asymmetry is one of the problems that entrepreneurs encounter when they start a project. Due to this, backers lack knowledge on the project's success, thus creating risk and doubt. Having FAQs is a form of interaction with the backers that assures them of the credibility of the project.
Jiang & Benbasat (2007); Koch & Siering (2015); Mollick (2014); Egger (2001); Fogg, et al. (2001); Park & Hopkins (1993);	Endogenous factors: Number of Videos	Videos provide backers with a better understanding of the project and serve to grab attention and add aesthetics. Furthermore, they provide a visual appeal that static images cannot. They allow backers to "meet" the project creators virtually, establishing greater trust. It also sends quality signals that reassures backers, as magnified through the Matthew Effect.
Siri (2015); Coveyou (2017)	Endogenous factors: Month of Launch	Campaign times are typically short. As such, project creators must execute these at optimal times. When planning when to launch a project, the creator must consider times and seasons potential backers are most likely connected online. Holiday seasons are least profitable.

RESEARCH DESIGN AND METHODOLOGY

The researchers based their assumptions on *Shul Vun Thun's Theory of Communication* aka the Four-Sides Model (Kraus, 2016), which Kraus (2016) adapted in his own theory of crowdfunding. The theory suggests that any message sent from a sender to a receiver comprises of four types of information: facts, self-revealing, relationship, and appeal. In relation to crowdfunding, these four types can be likened to the features of a crowdfunding page.

In line with this theory, the researchers proposed a conceptual framework that details each of the eleven endogenous factors surfaced from the literature, and listed in the hypothesis as having an effect, whether positive or negative, on the LORC of a campaign.

A *convergent parallel mixed methods* research design was used (Creswell, 2014), wherein both the quantitative and qualitative analyses were conducted at roughly the same time, followed by a cross-analysis and integration of results to generate further insights.

Throughout the analyses, two main platforms were used as samples - Kickstarter as a representative of global rewards-based crowdfunding platforms, and The Spark Project as a representative of local ones. For the quantitative analysis, datasets were sourced from publicly available data. For the qualitative analysis, information was gathered from interviews.

In the quantitative analysis, a predictive machine learning model with two main components was created. The first was a *linear discriminant analysis* (LDA) model that predicts the appropriate group membership of crowdfunding projects in either local or global crowdfunding platforms and determines the strongest discriminating variables amongst the eleven variables. The second is a *logistic regression* model that tests the significance of the eleven variables of this study on the LORC of projects, based on the datasets used. The logistic

regression analysis was conducted twice - once for Kickstarter, and once for The Spark Project - since the researchers speculated that the variables with a significant impact on LORC would vary between global and local platforms.

In the qualitative analysis, *guided, semi-structured in-depth interviews* were conducted, centered primarily on the eleven variables. This involved three key respondents who have had firsthand experience with online crowdfunding in Kickstarter and/or The Spark Project. One respondent was Patch Dulay, the CEO and founder of The Spark Project, who also has experience in creating and backing projects locally and internationally. The other respondent was Richard Dacalos, the creator of the Upstart board game, which was successfully funded in both Kickstarter and The Spark Project. He is also a project backer in both platforms. The other respondent was Stephen Co, creator of Tropic Haze, which is one of the first projects in The Spark Project. He is also a project backer in The Spark Project. It is worth noting that none of the respondents were told the results of the statistical analyses before or during the interview, so as to avoid biasing their responses.

The results from both quantitative and qualitative analyses were then compared in a cross-analysis that focused on the endogenous factors that most affect LORC, as well as identifying variables for future studies to look into.

To see a summary of the methodology design described, see the figure below:

DATA ANALYSIS AND INTERPRETATION (QUANTITATIVE)

For the quantitative analysis, the researchers first performed linear discriminant analysis (LDA). However, prior to that, they performed certain pre-tests such as: a Covariance Matrix Heteroscedasticity Test and a Multivariate Outlier Test, wherein necessary adjustments to the dataset were made. The linear discriminant analysis results are below:

Table 3
Standardized Canonical Discriminant Function Coefficients

Independent Variables	Canonical Coefficients	
Currency	USD	4.437
	CAD	2.369
	GBP	3.538
	AUD	1.893
Month of Launch	Jul	-0.157
	Sep	-0.135
	Nov	-0.113
Number of FAQs	-0.202	

The group centroid for local platforms was derived to be located at -10.876 on an axis, while that of global platforms is located at 1.699. Considering the midpoint of -4.5885 between both centroids, observations with discriminant scores greater than -4.5885 are more likely to be suited for global platforms, while those with discriminant scores less than -4.5885 are projects that are more likely to be suited for local platforms. Hence, variables with positive coefficients

make a project more likely to be suited for global platforms, while those with negative coefficients point to local platforms.

The discriminant score of an observation can be calculated by substituting values in the discriminant function:

$$x\lambda = (4.437)X_{CURusd} + (2.369)X_{CURcad} + (3.538)X_{CURgbp} + (1.893)X_{CURaud} + (-0.202)X_{FAQ} + (-0.157)X_{MONjul} + (-0.135)X_{MONsep} + (-0.113)X_{MONnov} + \varepsilon$$

To determine the goodness of fit for the linear discriminant model, the researchers examined its eigenvalue (18.568), and its Wilk's Lambda (0.051, sig. 0.000). Since the eigenvalue is a positive non-zero value, and Wilk's lambda is significant, then the model used for the LDA is good representation of the given phenomenon.

After the linear discriminant analysis, the researchers performed binary logistic regression analysis twice - once for global platforms (i.e. Kickstarter) and another for local platforms (i.e. The Spark Project). Prior to which, they also did certain pre-tests such as: Multicollinearity Test, Misspecification Test, and Autocorrelation Test. The results of such pre-test showed no problems in the datasets. Continuing, the results for the binary logistic analysis below:

Table 4
Logistic Regression Results for Kickstarter (Global)

		Coefficient	Odds Ratio	p-value	Significance
Constant		1.82922	-	0.2022	
Amount of Capital Required		-0.731154	0.4814	<0.0001	***
Campaign Length		-0.0348117	0.9658	0.0155	**
Number of Videos		-0.261224	0.7701	0.0135	**
Number of Images		0.0411576	1.0420	0.0293	**
Number of FAQs		0.308802	1.3618	0.0074	***
Facebook Connectivity		-0.574965	0.5627	0.0631	*
Number of Updates		0.387468	1.4732	<0.0001	***
Currency	USD	3.14488	23.2170	0.0107	**
	CAD	2.44607	11.5429	0.0819	*
	EUR	3.54397	34.6039	0.0591	*
	GBP	2.42095	11.2565	0.0590	*
Product Market Category	Arts	1.15396	3.1707	0.0102	**
	Music	1.59048	4.9061	0.0005	***
	Film	1.43325	4.1923	0.0006	***
	Publishing	1.09270	2.9823	0.0152	**
Month of Launch	Apr	0.676241	1.9665	0.0326	**

*Significant: $\alpha = 0.10$; **Very Significant: $\alpha = 0.05$; ***Highly significant: $\alpha = 0.01$

Table 5
Logistic Regression Results for The Spark Project (Local)

		Coefficient	Odds Ratio	p-value	Significance
Constant		10.9290	-	0.0088	***
Amount of Capital Required		-1.32592	0.2656	0.0125	**
Number of Reward Levels		-0.290980	0.7475	0.0796	*
Number of FAQs		0.181634	1.1992	0.0776	*
Number of Updates		0.351522	1.4212	0.0763	*
Month of Launch	May	2.05191	7.7827	0.1105	
	Jul	1.63476	5.1282	0.0960	*

*Significant: $\alpha = 0.10$; **Very Significant: $\alpha = 0.05$; ***Highly significant: $\alpha = 0.01$

Similar to the LDA, the researchers also determined the goodness of fit for both the global and local models. Using three pseudo R-squared values (McFadden's R^2 , Cox & Snell R^2 , and Nagelkerke R^2), the researchers arrived at values ranging from 0.353 to 0.506 for the global model, and 0.250 to 0.384 for the local model. According to McFadden, Hensher, and Stopher (1979), values of at least 0.2 to 0.4 already represent an excellent fit for the model. Hence, the logistic regression models used for this study are accurate representations of the relationship between the different endogenous factors and LORC.

After both linear discriminant analysis and binary logistic regression, the researchers used the derived discriminant function and logit link functions to create a machine learning model that predicts if a project would be more suited to a global or local platform, and if it would have a high or low LORC. The model correctly predicts platform membership 99.30% of the time, and correctly predicts LORC 79.30% for a global platform, and 77.80% for a local platform (considerably greater probability in comparison to chance prediction).

DATA ANALYSIS AND INTERPRETATION (QUALITATIVE)

The respondents shared contextual insights on all eleven variables set out for this study, as well as on new variables (i.e. quantifiable and unquantifiable) that factor in prominently in a project campaign's LORC. Among the new variables, the most emphasized ones included *story*, *product* (i.e. quality, marketability), and *crowd* (i.e. initial network, community). For the purposes of this summary, the researchers focus on the insights that indicate that a variable has a significant impact on LORC. These are detailed in the succeeding table:

Table 6
 Respondents' insights resulting from in-depth interview

Variables	KICKSTARTER				THE SPARK PROJECT			
	PD	RD	SC	Supported	PD	RD	SC	Supported
Amount of Capital Required	✓	✓	✓	FS	✓	✓	✓	FS
Campaign Length	✓	✓	✓	FS	✓		✓	PS
Currency				NS	✓	✓		PS
Facebook Connectivity	✓		✓	PS	✓	✓	✓	FS
Month of Launch		✓		PS	✓	✓		PS
Number of FAQs	✓		✓	PS	✓			PS
Number of Images	✓	✓	✓	FS	✓		✓	PS
Number of Reward Levels	✓	✓		PS	✓			PS
Number of Updates	✓		✓	PS	✓		✓	PS
Number of Videos	✓	✓	✓	FS	✓	✓	✓	FS
Product Market Category			✓	PS	✓	✓	✓	FS
Story**	✓	✓	✓	FS	✓	✓	✓	FS
Crowd**	✓	✓	✓	FS	✓	✓	✓	FS
Product**	✓		✓	PS	✓		✓	PS

Note: PD = Patch Dulay; RD = Richard Dacalos; SC = Stephen Co;
 FS = Full Supported; PS = Partially Supported; NS = Not Supported
 ** New variables that emerged during the interview

In the table shown, the check marks signify that the designated respondent indicated that the corresponding variable has a meaningful impact on LORC under the given online platform. In cases where all three respondents indicate a significant impact (i.e. three checks), the variable is “fully supported”. In cases with less than three, then it is “partially supported”. In cases with none of the respondents, then it is “not supported”. Table 7 contains the further insights of respondents.

Table 7
 Insights from the Respondents

	PD	RD	SC
Amount of Capital Required	"Doable" goal needed; 80-30 rule; backers need to feel like their contribution has impact	Very important in both local and global platforms; lower target may be more effective	Ideal amount would depend on the type of product; although he says its not important, he still makes suggestions and insights. For The Spark Project, somewhere between 600,000 to 800,000 is doable.
Campaign Length	30-45 days is ideal; "peak" at start and end of campaign	Nothing more than 30 days is good; First 48 hours is peak of hype	About one month to 45 days; within first two weeks, about 70% of target should have

been achieved

Currency	Says PHP is good for local, but says nothing about its impact abroad	Not a major issue	No major comment; PHP locally is common;
Facebook Connectivity	FB is a good indicator of social network, and can be valuable for gaining a following prior to a project; "first level supporters"	Facebook has a high penetration rate in the Philippines. FB is not as prominent abroad, since alternatives like Instagram, Twitter, and even Reddit and Product Hunt are chosen for credibility	People tend to do background checks on projects. They would want to investigate the FB page for credibility, information, the creators, etc
Month of Launch	He implies that projects require preparation phases and timing, he does not make any specific reference to international seasons. Locally, two main seasons: Christmas and Summer.	Can be challenging to time; In the case of Kickstarter, consider when backers pay credit card bills. Consider Christmas and summer	No comment; said it could be important, but did not consider it; just launch when you're not busy and when your project is ready
Number of FAQs	Important for transparency	Mentioned its inclusion, but nothing on its impact	Although he does not make use of it, he acknowledges it is important for disclosing information in relation to the projects' post-funding activities. In his experience locally, questions are usually directed at him.
Number of Images	Has comparable effect to videos	Important for showing features	More images is better, but quality is also important
Number of Reward Levels	5-7 Levels based on Kickstarter insights. One must appeal to different appetites; for The Spark Project, minimum of 500 pesos, max of 10K reward	3 is optimal; fewer is good to make things less confusing	Not as important, but maybe 5 would be good
Number of Updates	Transparency is important to assure backers; noise needed to keep people engaged, even if some projects do not post	Emphasized the use of videos for updating people, rather than the typical updates (text-based)	More updates would be better to give the impression of movement and progress; good for marketing
Number of Videos	Video is one of the first things that a potential backer sees and acts as first pitch.	Videos are essential for building trust and getting backers to trust the creator	Quality of video is essential; however, having just one would be enough

Product Market Category	Suggests that Kickstarter started out as film and art, then got tech projects; but made no insights on current trends and impact. Locally, product design (fashion, bags, shoes, etc) and food that doesn't spoil quickly are popular.	Simply mentioned check Kickstarter statistics, but did not give any specific insights. Mentioned that in The Spark Project, all rewards-based products are more popular or prominent	Product category should be determined based on target market; "crowfundability" (i.e. can the product thrive on crowdfunding, or should you course it through other funding methods); follow trends. In The Spark Project, tangible and durable products are the most popular
Story**	The most important factor; lets people relate to the project and the team behind it	"Why are you crowdfunding"; if money is the motive, then don't do it; a good story is important to back good video, etc	Story is essential, and he asserts it's the most important factor; story can determine whether a product can be crowdfunded or not; most projects that succeeded had "a good story to tell"
Crowd**	Friends and network who a project creator initially taps; 80 percent of funding comes from them; need to identify them first before launching	Larger starting community is good, since 33% of funding target will come from them	Suggests that one must approach initial family and friend first when asking for funding; also, importance of marketing is emphasized
Product**	A unique product is a source of motivation for people who want to own a product before it even reaches the market; Quality is essential		Product needs to be timely and relevant to market demands. If product is not relevant or timely, then it might not succeed, even with a good story

** New variables that emerged during the interview

DATA ANALYSIS AND INTERPRETATION (CROSS ANALYSIS)

Initially, variables were identified that were significant to LORC based on statistical analysis and the insights of respondents. Now, the results from both methods are compared, as shown in the next table:

Table 8
Tabulated Cross Analysis results

Factors	Quantitative		Qualitative	
	Kickstarter	The Spark Project	Kick-starter	The Spark Project
Amount of Capital Required	✓ (-)	✓ (-)	FS	FS
Campaign Length	✓ (-)		FS	PS
Currency	✓ (+) USD, CAD, EUR, GBP		NS	PS
Facebook Connectivity	✓ (-)		PS	FS
Month of Launch	✓ (+) Apr	✓ (+) Jul	PS	PS
Number of FAQs	✓ (+)	✓ (+)	PS	PS
Number of Images	✓ (+)		FS	PS
Number of Reward Levels		✓ (-)	PS	PS
Number of Updates	✓ (+)	✓ (+)	PS	PS
Number of Videos	✓ (-)		FS	FS
Product Market Category	✓ (+) Arts, Music, Film, Publications		PS	FS

*✓ = Statistically significant

FS = Full Supported; PS = Partially Supported; NS = Not Supported

The results of the cross-analysis show the variables that are conclusively impactful (considered both significant in the quantitative analysis and fully supported in qualitative analysis) to the LORC of a campaign project and those which require further study.

CONCLUSION AND RECOMMENDATIONS

The following are the variables that were both statistically significant (quantitative method) and fully supported by all three respondents (qualitative method) for each platform:

Kickstarter

- Amount of Capital Required
- Campaign Length
- Number of Images
- Number of Videos

The Spark Project

- Amount of Capital Required

All variables not mentioned above as to be considered both statistically significant (quantitative method) and fully supported by all three respondents (qualitative method) for each platform require further studies as these variables only showed some form of support for only either the quantitative or qualitative method.

Table 9
Table of Accomplished Objectives

Approaches	Methods	Research Question(s) Addressed	Objectives Addressed	A priori propositions
Quantitative (Phases 1 & 2)	Linear Discriminant Analysis Binary Logistic Regression Predictive Machine Learning Model	1,2,3,4	1,2,3,4	1
Qualitative (Phases 1 & 2)	Qualitative in-depth interviews	5	5	2
Quantitative & Qualitative (Phase 3)	Cross-Analysis of Findings	2,4,5	1,2,4	1,2

Machine Learning Program (Contribution to Practice)

As mentioned earlier, the Python-based machine learning program uses a supervised discriminant algorithm and logistic algorithms to predict platform membership and LORC. To execute the algorithms, the program implemented the *pandas*, *numpy*, *matplotlib*, and *sklearn* modules. The researchers hope that this program can and will be implemented in various online crowdfunding platforms to help future entrepreneurs determine which platform is best suited for them, and if their projects are predicted to have a high LORC.

To view the program, you may open this link: <https://github.com/J1Barcelon/crowdfundingPredictor>.

Theory Recommendation (Contribution to Scholarship)

Based on the results of the study, the researchers propose a new theory to contribute to academic research on the topic. The new theory is a modification to the crowdfunding adaption to the Theory of Communication described earlier in Chapter 3. Among the changes to the theory include the *project owners* of the message is replaced with *project creators* while retaining the *crowd* element. In addition, the *project* element was replaced with *campaign*, wherein *campaign* refers to the the general phenomenon behind a crowdfunding project, encapsulating two new concepts or layers: *story* and *project*. The *story* consists of certain variables that act as the foundation of a campaign. The researchers believe that in a crowdfunding context, story includes variables that answer the 5Ws, what, where, why, when, where, who, and also how. This also pertains to the first components project creators usually address when conceptualizing a crowdfunding campaign, which in turn are also the first aspects the crowd will usually acknowledge or identify in a campaign. These variables are namely: *product*, *video*, *images*, *updates*, *reward levels*, *social media*, and *product market category*. Together, these creates a

coherent story of the campaign and how it's delivered. These are based on the qualitative results, the *story* of a campaign communicates is ultimately one of the main factors that contributes to its successful backing. Ultimately, the campaign cannot move forward if the project creator is not convinced with the compellingness of the campaign's story.

On the other hand, *project* includes technical and external variables that are influenced by the campaign's story and are technical aspects that also contribute to the information communicated by the project but do not directly affect the story. These include *currency, FAQs, campaign length, and amount of capital required*. With the explanation of the concept behind the separate layers, story and project, the researchers believe that under campaign, these are mutually inclusive, where one cannot exist without the other. However, factors that differ between these two concepts are based on the variables' indispensability in communicating the essence of a campaign as well as their significance to LORC based on the study's quantitative and qualitative analyses. The researchers proposed is the inclusion of a *feedback* element from the crowd to the campaign, which is communicated back to the project creators. While many responses are possible, feedback in the context of crowdfunding is merely limited to the dichotomous choice of whether one backs the project or not in order to determine campaign's effectivity. Thus, the flow of communication, begins with the project creator first conceptualizes the story then extracts the project details. Upon communicating the campaign, the crowd processes the story, recognizes the project or details behind it, and gives feedback on the campaign to the project creators. The entirety of this theory's outcomes will then be based on the interaction that occurs in either the global or local context due to the varying results from using global and local crowdfunding platforms.

To visualize this modified theory, the researchers have made the following diagram:

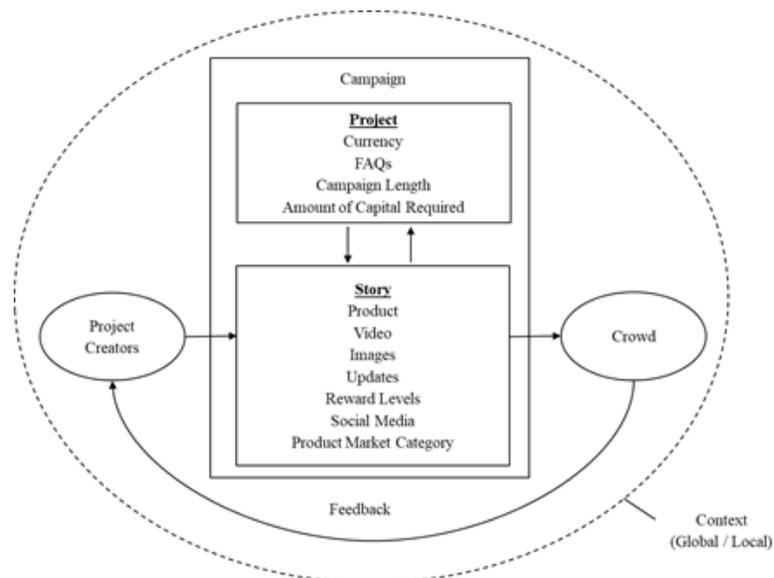


Figure 1. Proposed revised theory of communication

Recommendations for Future Research

As for our recommendation for future research, we identified six (6):

1. Extend the topic to other types of crowdfunding (debt, equity, donation-based)
2. Extend the topic to other prominent online crowdfunding platforms (Indiegogo, Gofundme, etc.)
3. Acquire a greater sample dataset confidence level, perhaps 99%
4. Look into factors discovered in the qualitative aspect of this study, outside the initial list of endogenous factors (e.g. Product, Story, Crowd)
5. Review the differences in quantitative and qualitative results of this study and create as basis for future research to confirm, explore, and explain these differences
6. Program a graphical user interface (GUI) using packages such as *tkinter* or *kivy*

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REVENGE OF THE ELECTRIC CAR IN THE 2020S: A CASE STUDY

Ahmed Maamoun, University of Minnesota

ABSTRACT

To say Elon Musk is a disrupter is quite an understatement. The self-made billionaire has transformed several industries (Electric Vehicles, financial services, space travel, hyperloops, artificial intelligence, etc.). He is also a charismatic marketing genius who is able to create buzz and excitement whenever he speaks or tweets. Tesla is the king of Electric Vehicles (EVs) with a state-of-the-art production factory in California. The company delivered 245,000 vehicles globally, and the Model 3 was the top selling electric car in the United States in 2018. The company turned in a profit for the first time in 2019; and is in the process of building a lithium-battery gigafactory in Nevada and an EV manufacturing facility in China. Between the California and Shanghai factories, Tesla will have the capacity to produce 1 million vehicle a year. The new Roadster, Model Y, and Cybertruck will commence production in 2020. This is all great news for many stakeholders, especially Musk who has never received a paycheck from Tesla. Shareholders voted in 2019 to grant him \$2.6 billion in stock options to be vested if Tesla's market value reaches \$100 billion by 2028. This could substantially boost the 48-year-old entrepreneur's net worth and make him the richest person on Earth even though he prefers to die on Mars.

Now that Tesla has removed every doubt it can be done, nearly every big name in the industry is trying to get a piece of the electric car market. Major automakers are jumping on the EV bandwagon to capture a piece of the growing pie. Audi, Mercedes, Porsche, and Volvo are rolling out luxurious electric vehicles for the first time. GM, Honda, Nissan, and Toyota are upping their EV game. Tesla will soon compete with a sea of EVs both in the United States and overseas. Only time will tell if Tesla and its boss will keep the crown. The paper highlights the challenges involved in the auto industry in general and the EV niche in particular.

Keywords: Innovation, Entrepreneurship, Self-Made Billionaire, New Product Development, Underdog

INTRODUCTION

The South African-Canadian-American entrepreneur, Elon Musk, is best known for his cosmic imagination and risk-taking drive to bring about a more high-tech world. Musk has an impressive resume and a knack for founding avant-garde companies, with Tesla as the crown jewel. He is the primary investor with 22% of shares and \$80 million invested in 2004. Since then, Musk almost single handedly established the electric car market; and now there is no doubt the future of cars is electric. Tesla is the king of EV with a luxurious and innovative product mix: Roadster, Model S, Model X, Model Y, Model 3, and Cybertruck. Global deliveries in 2018 were 245,000 vehicles, and the company's market capitalization was \$43 billion. However, Tesla has struggled to become profitable. After a decade of being in the red and billions of dollars in

losses, the company turned a profit for the first time in the third quarter of 2019. The credit goes to the affordable Model 3 and a record delivery of almost 100,000 vehicles to the mass market.

Elon Musk is the world's richest inventor with a net worth of \$20 billion. Although Musk is the CEO and Product Architect of Tesla, he has never received a salary from the company. However, his current contractual arrangement could be extremely rewarding if Tesla's market capitalization soars to \$100 billion. In January 2019, Tesla shareholders voted to award Musk \$2.6 billion in stock options if he manages to hit that market cap in the next 10 years. This is not far-fetched given the company's phenomenal growth in terms of revenues and deliveries. It is safe to say that the self-made billionaire is striving to revolutionize mobility both on Earth and in space, and he might become the world's richest person in the process.

ELON MUSK

Elon Musk is one of the most controversial inventors in history and he is promising to deliver the future today. He is promising to get rid of internal combustion engines and fossil fuels. He is promising 100% self-driving cars with zero emissions. He is promising hyperloops below Earth and colonies on Mars. Fortunately, he has the passion and the money to make it happen. Known for the companies he has founded or developed including PayPal, Tesla, and SpaceX, Elon Musk has had a gigantic impact on multiple industries and is poised to have a major impact on the auto industry in particular. In the 70's there were a lot of concept cars that were slick and futuristic. However, none of them ever became a reality. The genius of Tesla and Musk is that they are rolling out concept cars and selling them as a production cars. People know what they see will become a reality they will get to enjoy. So Musk/Tesla's brand strategy is: We deliver on the future. For instance, when the Model X was launched in 2015, consumers saw humans driving around in pods shaped like huge eggs, with doors that open upwards like wings, and are smart enough to drive themselves without hitting other cars. In 2019, the Cybertruck came along, and it certainly looked like nothing else. It didn't just look "different," it looked like it was literally from another planet. Nevertheless, its price started at \$39,900. The average American consumer can afford a 40-grand brand new vehicle and that's why Tesla received 200,000 orders (\$8 billion in sales) in just 72 hours. A Cybertruck first impression YouTube video has garnered 10 million views and had 40,000-plus comments in a matter of a few days. You cannot put a price on such publicity. In brief, consumers' faith in Musk's ability to deliver the future today has garnered this loyalty to the Tesla brand.

On the other hand, the fact that Tesla's fate is closely linked to Musk's actions is a double-edged sword. Musk is still leading the field in innovation, but he is rebellious and nonconformist. For instance, Musk hopes to die on Mars not Earth! Should he leave the company or suddenly sell his 38.6 million Tesla shares, the stock price will fall dramatically. Musk has arguably too much responsibility serving as Tesla and SpaceX CEO, plus running the Boring Company and OpenAI, which raises the risk of him being pulled in too many directions. Musk is also an unpredictable person. The controversial rocket scientist smoked weed during a live interview causing Tesla's shares to crash and key executives to quit (Mitchell, 2018). Then he settled with the SEC in September 2018 for making alleged "false statements" about a plan to

take Tesla private, and had to step down as chairman. Musk took the deal to avoid a treacherous battle with the agency that may have cost him his CEO position as well (Goldstein, 2018).

TESLA

Founded in 2003 and named after the engineering genius Nikola Teslaⁱ, the California-based company aims to transition the world to electric mobility by manufacturing and mainstreaming electric vehicles (EVs). Commercial production started in 2008 when the Tesla Roadster was debuted. Then Tesla introduced Model S in 2012, Model X in 2015, Model 3 in 2017, Model Y and Cybertruck in 2019. The company went public in 2010 and has roughly 50,000 employees. Global deliveries in 2018 were about 250,000 vehicles. As of 2019, Tesla had a market value of \$43 billion. Musk is the primary investor with 22% of shares and \$80 million invested (Alvarez, 2019).

Table 1: Number of Tesla Vehicles Delivered Worldwide (2016 – 2019)

Quarter/Year	Vehicles
Q1 2016	14,820
Q2 2016	14,370
Q3 2016	24,500
Q4 2016	22,200
Q1 2017	25,000
Q2 2017	22,000
Q3 2017	26,150
Q4 2017	29,870
Q1 2018	29,980
Q2 2018	40,740
Q3 2018	83,500
Q4 2018	90,700
Q1 2019	63,000
Q2 2019	95,200
Q3 2019	97,000
Q4 2019	105,000 (Forecast)

Source: Statistica

It has been a bumpy ride for Tesla and Musk. The first Roadster was scheduled to be delivered in 2006. However, production was delayed and the first 100 vehicles were delivered almost 2 years later in 2008. The Roadster came with a price tag that most people could not afford (\$100,000). The price was a message not only about the car, but also the owner. Musk's initial strategy was to position Tesla as a premium product and create a luxury image before gradually producing affordable vehicles for the mass market. His next move was to offer more reasonably priced sedans. Model S was introduced in 2012, and Model X in 2015. In 2017, more than 500,000 orders have been placed for the highly anticipated Model 3. In November 2019, Musk unveiled his company's first electric pickup truck. The Cybertruck is Tesla's sixth vehicle and definitely its most peculiar. Musk taunted Ford and Porsche when he boasted his futuristic truck's torque and speed in a controversial tweet. Then he decided to double down on his new truck's superiority and escalate the war by another provocative tweet boasting a "tug of war"

video showing a Cybertruck pulling an F-150 uphill with ease. The tweet garnered 14 million views; and more than 200,000 orders were placed within 72 hours (Liao, 2019). Ford was not very happy with the video and has requested a rematch claiming the first one was not fair.

Table 2: Tesla Models

Model	0-60 MPH (Seconds)	Top Speed (MPH)	Range (Miles)	Price (USD)
Roadster	1.9	250	620	200,000-260,000
Model S	2.4	160	370	90,000-110,000
Model X	4.4	155	325	85,000-105,000
Model Y	5.5	130	300	47,000-57,000
Model 3	5.3	140	300	39,000-49,000
Cybertruck	6.5	110	250	40,000-70,000

Source: Tesla Homepage (November 2019)

Another distinguishing characteristic of Tesla is the experience of buying and owning the vehicle. Tesla customers do not go to a dealership or haggle with a pushy salesperson. Tesla sells its vehicles directly through its own stores and website. Typically, the stores are placed in upscale malls or wealthy suburbs, very close to the Apple stores on which they were modeled after. The sales people are not compensated on commission and are there simply to answer questions. Regardless of how the vehicle is purchased (in store or online), Tesla would bring it to the buyer's home, office, or anywhere else they wanted it. The company also offers customers the option of picking their cars up from the factory in Silicon Valley and inviting their friends and family to a complimentary tour of the facility. If something goes wrong with the car, Tesla's engineers would tap into the car via the Internet and download software updates. All new Tesla cars come standard with advanced hardware capable of providing autopilot. It is noteworthy that the self-driving feature has allegedly caused numerous crashes. Despite the adverse media attention, Tesla has unequivocally defended its autopilot feature. Musk has even boasted that by 2022, Tesla would "probably" stop producing cars with steering wheels or pedals, implying that self-driving cars will be the most desired vehicle type by then (Ottley, 2019).

Regardless of all this hype, Tesla has been in the red from inception until late 2019. Selling a lot more vehicles wasn't translating into profits. Table 3 shows how revenues grew from nearly \$15 million in 2008 to \$21.5 billion in 2018. Although this may seem like phenomenal growth, the company has lost \$3 billion over the last 3 years alone. Tesla maybe making quality, luxurious, and futuristic vehicles; but the company is no exemplar of financial stability.

Table 3: Tesla Revenues and Losses (2008 - 2018)

Year	Revenue (USD)	Operating Expenses	Non-Operating Expenses	Pre-Tax Income
2008	14,742,000	93,246,000	4,181,000	(82,685,000)
2009	111,900,000	163,840,000	3,817,000	(55,714,000)
2010	116,700,000	263,582,000	7,317,000	(154,155,000)
2011	204,200,000	455,730,000	2,434,000	(253,922,000)
2012	413,260,000	807,539,000	1,794,000	(396,077,000)
2013	1,997,790,000	2,074,799,000	10,143,000	(71,426,000)
2014	3,198,360,000	3,385,045,000	97,947,000	(284,636,000)
2015	4,046,020,000	4,762,654,000	158,995,000	(875,264,000)
2016	7,000,130,000	7,667,472,000	79,008,000	(746,348,000)
2017	11,758,750,000	13,390,840,000	576,946,000	(2,209,032,000)
2018	21,461,270,000	21,849,340,000	616,672,000	(1,004,745,000)

Source: Macrotrends (2019)

Things turned around for the first time in 2019 when Tesla defied all expectations and achieved \$143 million profitability in the third quarter (\$1.86 earnings per share versus expected losses of 42 cents per share). That's a breakthrough for the decade-old automaker and its boss who became \$2 billion richer that day because of the stock's abrupt spike (Stillman, 2019). Between June and September 2019, Tesla delivered a record 97,000 vehicles to customers. The company is on a smooth ride to sell at least 360,000 vehicles by the end of 2019. Thanks to a strong performance of its Model 3 sedan. Approximately 6,000 cars per week found new homes during the quarter, contributing to the company's bottom line (Liedtke, 2019).

This is good news to many stakeholders, especially Elon Musk who has never taken a paycheck from Tesla, refusing his \$56,000 minimum salary every year. In March 2019, Tesla shareholders approved a new payment plan awarding Musk \$2.6 billion in stock options, if (and only if) Tesla hits the \$100 billion market value cap in the next decade. The \$2.6 billion amount was March 21 current stock valuation. Then for the next 10 years, Tesla won't pay its boss anything (no salary, bonus, or stock) until the company reaches that \$100 billion market capitalization. If Musk meets the challenge, he could net more than \$184 billion by 2028. If and when that happens, Musk could potentially surpass Amazon's CEO, Jeff Bezosⁱⁱ, as the richest person in the world (Wieczner, 2018).

THE AUTO INDUSTRY

The automobile manufacturing industry has witnessed bumpy roads over the five years to 2019. Revenues have been stagnant and many companies are in the red. Major players include Audi, Fiat Chrysler, Ford, General Motors, Honda, Mercedes Benz, and Toyota. These companies compete primarily on the basis of price, fuel economy, reliability, styling, and utility.

Table 4: Automobile Industry Revenue Growth (2005 – 2019)

Year	Revenue (\$ million)	Growth %
2005	114,143.7	0.0
2006	118,143.0	3.5
2007	103,503.3	-12.4
2008	96,822.0	-6.5
2009	60,645.7	-37.4
2010	84,591.5	39.5
2011	94,458.4	11.7
2012	122,839.7	30.0
2013	127,758.1	4.0
2014	135,121.4	5.8
2015	134,445.7	-0.5
2016	138,571.4	3.1
2017	123,508.4	-10.9
2018	112,384.1	-9.0
2019	112,540.2	0.1

Source: IBIS World (2019)

Over the five years to 2024, the industry is expected to continue its struggle. Automakers are projected to continue producing fewer and fewer internal combustion engine cars. As consumers become increasingly environmentally conscious, major players have focused operations on the production of hybrid and electric cars. This product category is set to generate the greatest revenue moving forward. The conventional automobile industry is in the mature stage of its life cycle. Industry output has decreased despite overall economic improvements and rising consumer confidence. Compact vehicles, midsize sedans, and SUVs have been doing poorly. When coupled with brand consolidation, the result is a phasing out of many inefficient vehicles as major players restructure to meet consumer preference. The largest technological change in this industry's products has been more widespread availability of green technologies. Each year, many automakers are reintroducing vehicle makes and platforms to include hybrid or electric versions. The increased production of green vehicles shows a general trend that the industry is heading in. This might be the only factor keeping the industry from getting into the decline stage.

WILL MUSK'S PASSION PAY OFF?

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for a decade to prove that building and selling electric cars can be a sustainably profitable business. Tesla turned in a profit for the first time in the third quarter of 2019, and Musk is optimistic that once the Shanghai factory starts production, Tesla will have the capacity to deliver 1 million car a year. Musk is also the CEO and major shareholder in SpaceX with a 54% stake. His next generation spacecraft, Starship, may eventually take humans to Mars for a mere \$100 grand for a one-way ticket. Students born in the 2000s will certainly see this in their lifetime. The impact on Musk's net worth will be astronomical if this borderline science fiction materializes!

Some students may contend that if Model 3 along with the new models do well in the United States, China, and Europe; it is not far-fetched that Musk's stake in Tesla could exceed \$80 billion by 2028. Other students will argue that gasoline engines are going to remain very relevant for a long time. Even with this push towards electrification, the point where we get to a full battery-electric fleet across the country is very far away. Regardless of the hype generated by Tesla, even the most optimistic forecasts call for full EVs to account for only around 8 percent of the U.S. market by 2025. They represent less than 2 percent today. Also, some students will be skeptical of the 1 million number, given Tesla sold about 250,000 vehicles globally in 2018.

The bottom line is that it will be much easier to answer this question in the future. The one thing we know today is that Musk he has a knack for theatrics. The tech guru seems to be overly optimistic with a tendency to overpromise. And if you are doubting this, watch how he announced the Tesla Cybertruck or SpaceX Starship in November 2019. We have to respect his boldness, but that doesn't mean it's going to be successful.

WHO WILL COME OUT ON TOP?

Tesla is currently the king of EVs. Tesla's Model 3 is on the leading edge of auto technology, but is priced at only \$35,000. The upcoming Cybertruck is expected to disrupt the pickup truck market, and is priced at only \$40,000. In 2019, Tesla was approved to build a manufacturing facility in China, and is wrapping up a lithium-battery gigafactory in Nevada. Revenues and deliveries are growing at an exponential rate. In brief, Tesla is the industry leader and has proven that electric cars can be fast, luxurious, and even affordable.

However, the California electric car company will soon have formidable EV competition from premium brands it does not have today. However, with a new wave of electric cars already on the market or coming from Audi, BMW, Fiat, GM, Hyundai, Mercedes, Nissan, Porsche, Jaguar, and Volvo; Tesla will have to prove itself in a crowded field of competitors. For example, Audi's first-ever EV, the \$75,000 e-Tron, is already contributing nearly 5% of the automaker's sales mix. Boeing and Porsche even announced they are jointly developing a flying EV concept for urban settings (Rosevear, 2019). General Motors anticipates the launch of its steering wheel-free, electric Chevy Bolt in 2020. Volvo XC90 self-driving EVs are coming out around the same time. BMW is pushing its "i" models, with the catchy slogan: "Innovation starts with i". Fiat is expected to do well with its all new 500e model. The same goes for the Hyundai Kona. Mercedes is cutting 10,000 jobs around the world to put more resources in EVs as the industry races toward its electric future. The German giant is rolling out its first EV, EQC, in 2020. The Amazon-backed Michigan-based startup, Rivian, is in the process of producing all-electric pickups and SUV. Amazon has ordered 100,000 electric delivery vans, to hit the roads in

2021 and 2022 (Dawson & Naughton, 2019). Toyota announced six new EV models launching for 2020–2025 to meet global demand (Greimel, 2019).

In conclusion, the paper highlights the complexity of mainstreaming futuristic products to the mass market. The paper also attempts to predict who will dominate the EV market in the future. Tesla has a chance to be the dominant EV firm and is a leader in autonomous vehicle technology, but it will probably have to fight harder to maintain its leadership. The competitive landscape is suddenly getting crowded. But Tesla has Elon Musk and the first-mover advantage.

LECTURE NOTES/DISCUSSION QUESTIONS

Tesla is a marketing case study in endless motion. The author typically starts the case discussion by asking students to go to Tesla’s website and spend a few minutes browsing the available models and even customize their own Tesla. This approach triggers a conversation about innovation, creativity, and visionary entrepreneurs. Depending on the scope and time of the class, the instructor can play clips from the two classic documentaries: “Who Killed the Electric Car?” and “Revenge of the Electric Car”. This should naturally lead to a debate about the future of EVs and who will dominate that market.

Another approach that the author has found valuable in generating discussion is to poll students: “Would you consider purchasing an EV?” or “What comes to your mind when you hear or see the Tesla brand?” or “What do you think of Elon Musk?” This will get students to talk about their perceptions of both Tesla and Musk. Students could also be asked to browse the websites of other major automakers and check the strides they are making in the EV category. The instructor may ask students to go online after the discussion is over and find updates on Tesla’s current deliveries, revenues, and profitability. Finally, since the case has brought up the possibility of Musk becoming the richest person in the world in the next decade, students could be asked to check out his net worth in real time. It would be intriguing to see if his passion for and bet on Tesla has paid off. And if he hasn’t beaten Jeff Bezos, students could locate his Roadster in space. After all, it is the only car orbiting the solar system and it should be there for millions of years. As a middle-aged man myself, I believe that having your car in outer space is a more ego-booster than being the richest man in history!

1. How did Elon Musk evolve as a maverick entrepreneur?

Elon Musk, (1971-), is a technology entrepreneur and engineer. Arguably, the South African/Canadian/American tech guru has single handedly revolutionized a number of industries. Over the last 25 years, Musk has built an inspiring resume that would normally take many lifetimes to accomplish. Some of the titles held included:

- Founder of The Boring Company
- Co-founder of Neuralink
- Co-founder of OpenAI
- Co-founder of SolarCity
- Co-founder, CEO, Product Architect of Tesla, Inc.
- Founder, CEO, Lead Designer of SpaceX
- Founder of X.com (now PayPal)
- Co-founder of Zip2

Musk grew up in Pretoria, South Africa. When he was 12, he taught himself to code, and even sold the source code for his first video game for \$500. After finishing high school, he moved to Canada to attend Queen's University in Ontario. In 1990, he transferred to the University of Pennsylvania, where he received two bachelor degrees (in economics and physics). When Musk was at college, he fed himself for less than \$1 a day. In 1995, he moved to California to pursue his PhD in applied physics at Stanford University; but dropped out within days to found an internet startup with his brother, Kimbal. They started Zip2, a city guide software for newspapers, with a \$28,000 loan from their father. In 1999, they sold Zip2 for \$307 million, and Elon walked out with \$22 million. He invested his Zip2 earnings to co-found X.com, an online banking service. The start-up quickly merged with its rival and became PayPal. In 2002, eBay bought PayPal for \$1.5 billion, and Musk netted \$180 million. He used \$100 million of his earnings to found SpaceX, an aerospace manufacturer and space transport services company. Meanwhile, he invested the remaining \$80 million in Tesla, an EV manufacturer, in 2004, the year after it was founded, and became its CEO and product architect. In 2006, he co-founded SolarCity, a solar energy services company (now a subsidiary of Tesla) and functioned as its chairman. In 2015, Musk co-founded OpenAI, a nonprofit research company that aims to promote artificial intelligence. In July 2016, he co-founded Neuralink, a neuro-technology company focused on developing brain-computer interfaces. In December 2016, Musk founded The Boring Company, an infrastructure and tunnel-construction company, specializing in building hyperloops.

Musk has overtly articulated that the mission statements of Tesla, SolarCity, OpenAI, and SpaceX stem from his vision to change the world and humanity. His goals include combating climate change through sustainable energy production and consumption. With a gigantic net worth hovering around \$20 billionⁱⁱⁱ, Musk is the world's richest rocket scientist. The notorious workaholic who will turn 49 on June 28, 2020, has expressed he won't rest until we have escaped Earth and colonized Mars! His goal is to drop the cost of the trip to Mars from \$10 billion per person today to just \$100,000 by 2024. According to him, people should be able to sell their

homes on Earth and move to Mars, and save money in the process. In other words, the cost of living on Mars will be less than Earth at one point in the future

2. Develop a SWOT analysis for Tesla.

<p>Strengths:</p> <ul style="list-style-type: none"> - Current dominant player in electric cars. - Location in Silicon Valley. - Strong brand and customer loyalty. - Elon Musk's ingenuity and passion. - Car resale value. - Autonomous driving technology. 	<p>Weaknesses:</p> <ul style="list-style-type: none"> - Limited number of charging stations. - Poor financial performance. - Logistical problems delaying deliveries. - Car service limitation. - High prices (some models).
<p>Opportunities:</p> <ul style="list-style-type: none"> - Gigafactory can supply competitors with batteries. - Depletion of oil reserves or drastic increase in oil prices. - Innovation and R&D. - Chinese booming EV market and global sales expansion. - Ride-sharing services. - Growing demand for green products. 	<p>Threats:</p> <ul style="list-style-type: none"> - More automakers focusing on EVs. - Development of hydrogen-powered cars. - Laws regulating self-driving cars and local dealerships. - Economic slowdown. Another recession would hurt sales.

3. Elon Musk is a passionate entrepreneur who runs Tesla for “free”. Do you think this passion will pay off and make him the richest person in the world?

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END NOTES

¹ Nikola Tesla (1856–1943) was a Serbian-American inventor known for designing the alternating-current (AC) electric system, which is the predominant electrical system used across the world today.

¹ Jeffrey Bezos is an American internet entrepreneur, who founded Amazon in 1994.

¹ Musk was the 23rd wealthiest American in 2019 according to Forbes.

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