If you've built it, will they fund? Examining the impact of product development in reward-based crowdfunding

Presented to the faculty of Lycoming College in partial fulfillment of the requirements for Departmental Honors in Business Administration

Gavin Williamson

Lycoming College

May 1st, 2020

Approved by:

_____

(Signature)

_____

(Signature)

_____

(Signature)

_____

(Signature)

Abstract

Crowdfunding has gained scholarly attention as a means for organizations that do not have access to traditional venture financing to raise funds. On popular reward-based crowdfunding platforms such as Kickstarter, funds are solicited via pitches heavily focused on the product the campaign team seeks to commercialize; however, there is little scholarly literature studying the impact of product development on fundraising success. Accordingly, this study draws on agency and signaling theory to explore how product development effects funding goal attainment directly and indirectly via third party endorsements. Data were collected from 1,394 Kickstarter campaigns and examined using path analysis. Results indicated that product development positively impacts funding goal attainment and signaling of endorsements from customers and professional reviewers, which in turn positively impacts goal attainment as well. Theoretical and practical implications are discussed, including the impact of this finding on crowdfunding's ability to close the "funding gap" in nascent venture finance.

If you've built it, will they fund? Examining the impact of product development in reward-based

crowdfunding

Crowdfunding has garnered interest from scholars and entrepreneurs for its promise in

making new-venture funding accessible to those nascent organizations that do not have access to

debt, angel, or venture capital (Mollick, 2014). Empirical research has identified numerous

characteristics of crowdfunding campaigns that affect the likelihood of success raising the

campaign creator's desired amount of money, including platform type (e.g. donation, lending,

reward; Belleflamme, Lambert, & Schweinbacher, 2014; Paschen, 2017), social networking

(Mollick, 2014), geography (Agarwal, Catalini, & Goldfarb, 2014), preparedness/project quality

(Mollick, 2014), and the size of the funding goal (Mollick, 2014; Koch & Siering, 2015).

However, the developmental state of the product the campaign is built around has yet to be

explored as an antecedent to fundraising performance. On reward-based crowdfunding platforms

like Kickstarter, creators can launch campaigns for products that are in the idea stage, already

being adopted by customers in the market, and at all points in between (Stanko & Henard, 2017),

yet no research to date has examined differences in fundraising performance between campaigns

featuring products that are fully developed and not fully developed.

The development of the central product of a crowdfunding campaign affects the

uncertainty borne by and information available to backers, who are faced with a well-

documented adverse selection problem (e.g. Agarwal et al., 2014). This indicates a need for

research determining the impact of product development on fundraising outcomes. Scholarly

interest in crowdfunding has been driven in part by crowdfunding's potential to narrow the

"funding gap" (i.e. insufficiency of financing available to nascent ventures due the high failure

rate of firms that are not yet profitable; Townsend & Hunt, 2019) in the earliest stages of venture

creation (Moritz & Block, 2016), a perspective supported by research by Mollick and Nanda (2016) that found the crowd funded more arts projects than expert gatekeepers while investing in a comparable number of successes. However, scholars have yet to explore whether fundraising performance differs for pre-and post-product launch organizations. This is a key gap in the literature, as pre-product launch organizations generally have no revenue and are thus at an acute disadvantage in securing other external financing relative to post product-launch firms (Petty & Gruber, 2011). By examining the influence of product development on goal attainment, this research aims to explore crowdfunding's utility as a source of capital for pre- and post-product launch organizations, clarifying when crowdfunding is most useful for organizations in need of external capital.

Past research on crowdfunding has established preparedness and size of funding goal as key predictors of fundraising performance (e.g. Mollick, 2014; Koch & Siering, 2015). Moreover, these variables affect the uncertainty borne by and information available to backers (Agarwal et al., 2014; Mollick, 2014; Koch & Siering, 2015), and therefore have theoretical bearing on the impact of product development. Therefore, the effects of product development are assessed concurrently with the effects of these variables known to influence goal attainment in this study. Studying these variables in a single cohesive framework allows for the assessment of the unique contribution of product development toward goal attainment.

Most studies of crowdfunding performance establish direct relationships between antecedents and goal attainment (e.g Mollick, 2014). Given that product development affects the information fundraisers send to backers, however, the signals sent from campaigns to backers should be explored as a mediator between product development and goal attainment. Signals of unobservable quality such as external endorsement are most likely to be signaled honestly when

firms have the action record and capital to earn such endorsements (Lounsbury & Glynn, 2001), and post-launch firms possess greater quantities of such resources on average (Paschen, 2017; Gartner, 1993). Signals of external endorsements have been studied extensively in crowdfunding as predictors of goal attainment (Courtney, Dutta, & Li, 2017; Mollick, 2013), including in mediation frameworks examining antecedents of these signals as well as their effects on goal attainment (Calic & Mosakowski, 2016). However, no study to date has linked endorsement signaling to product development in such a framework. This research addresses this gap by exploring indirect effects of product development on goal attainment via third-party endorsement signals.

The goal of the present effort is to examine the impact of product development on the fundraising goal attainment of reward-based crowdfunding campaigns. Specifically, I use path analysis to test the significance of the direct and indirect (via endorsements from professional reviewers and customers) effects of product development on goal attainment. This study makes three key contributions to the crowdfunding literature. First, this research answers the call made by the editorial board of *Entrepreneurship Theory and Practice* for more research attempting to understand the determinants of crowdfunding performance (McKenny, Allison, Ketchen Jr., Short, & Ireland, 2017). Second, this research extends the literature on quality signaling in crowdfunding, demonstrating how the development of the product itself alters the endorsement signals fundraisers send to their prospective backers and how this difference in signals, in turn, drives the success of campaigns. Finally, this research lays the foundation for rigorous study of where crowdfunding has the most impact on the funding gap. In the following sections, I will outline the theoretical background and hypotheses for this study, present the method and empirical evidence, and discuss implications, limitations, and directions for future study.

Goal Attainment in Reward-Based Crowdfunding

Crowdfunding, often characterized as an entrepreneurial alternative to self-funding and traditional venture financing, is undertaken by firms and individuals to acquire money, notoriety, and/or knowledge (Chemla & Tinn, 2019; Mollick, 2014), and takes a variety of forms differentiated by the compensation backers receive in return for their capital. In donation crowdfunding, backers give their money to causes and companies they want to support, with no expectation of repayment (Paschen, 2017; Mollick, 2014). In lending and equity crowdfunding, backers play the role of financier, providing their capital with the understanding that they will be either repaid or own a stake in the firm (Paschen, 2017; Mollick, 2014). Between these forms lies reward-based crowdfunding, a model wherein the backer contributes their capital in exchange for incentives which can vary from recognition to experiences to presales (Paschen, 2017; Mollick, 2014).

Reward-based crowdfunding is the most utilized form of crowdfunding (Mollick, 2014), and is the model that Kickstarter and Indiegogo, the two most prominent crowdfunding platforms in the world, are based on (Kim, 2018); it is therefore imperative that fundraising performance in reward-based crowdfunding be as well-understood as possible (McKenny et al., 2017). Accessibility of early-stage capital is a key concern of entrepreneurs looking to sustain their young firms, and efficient distribution of this capital is a key concern of the policymakers and stakeholders that support entrepreneurship (Freer, Sohl, & Wetzel, 2002; Shane, 2008; Townsend & Hunt, 2019). Crowdfunding is becoming an increasingly important capital market for both parties to understand fully, as more and more entrepreneurs turn to the crowd for capital (as of this writing, over $4.9B has been raised via Kickstarter, and Indiegogo exceeded $1.5B in 2018; Kickstarter Stats, 2020; Captain, 2018).

Backers' motivations to provide capital on crowdfunding platforms have been found to be as diverse as the rewards offered to them, with notable commonalities. Motives discussed in the crowdfunding literature include altruism and intrinsic prosocial motivation (Galak, Stephen, & Small, 2011; Allison, Davis, Short, & Webb, 2015), community benefits (Gerber, Hui, & Kuo, 2012; Belleflamme, Lambert, & Schweinbacher, 2014; Agarwal et al., 2014), and tangible investment rewards (Kuppuswamy & Bayus, 2013). Despite these diffuse motivations, research has identified one common thread in backer's reasoning to support projects – namely the chance of success of the project, based on its appeal and perceived quality (Mollick, 2014; Burtch, Ghose, & Wattal, 2011). If they are acting rationally (i.e. not out of disinhibition), backers contribute their money to campaigns that they would derive value from if the entrepreneur follows through on their stated goals and commitments (e.g. the backer receives the product promised as a reward from the entrepreneur, or the backer derives satisfaction from knowing the musicians they enjoy were able to record an album because of their support), and thus campaigns that have a lower chance of success (success in this context being defined as accomplishing what the campaign team says it will accomplish with the desired funds) are less attractive investments.

Given that backers value the success of the campaigns they back, the relationship between a fundraiser and a backer resembles a principal-agent relationship (Agarwal et al., 2014; Eisenhardt, 1989). Backers face an adverse selection problem in deciding which campaigns to fund, in that they do not know which campaigns are run by entrepreneurs capable of following through on their goals for their ventures and delivering backers' rewards in a timely fashion (Agarwal et al,. 2014). Traditional gatekeepers of entrepreneurial finance (e.g. banks, angel investors, and venture capitalists) conduct due diligence and network searches to verify that they are investing in capable entrepreneurs and plausible ideas, but most crowdfunding backers have

neither the means nor the incentive to engage in such activities (Agarwal et al., 2014; Townsend & Hunt, 2019). Therefore, backers must mitigate their risk by selecting campaigns that they perceive to be high quality (Agarwal et al., 2014).

Selection in Reward-Based Crowdfunding

Scholarship on reward-based crowdfunding has focused on signals of project quality, especially preparedness (e.g. Mollick, 2014), as predictors of fundraising performance. Signals are activities performed by economic actors providing information (often about their own attributes) to another party, usually an exchange partner like an investor, and in the crowdfunding context entrepreneurs send signals in an attempt to persuade prospective funders that they are a worthwhile and trustworthy investment (Vismara, 2018; Stiglitz, 2000). Preparedness, among the most salient traits of campaigns studied in crowdfunding research, signals quality, readiness to take a venture forward, and ability to consider what aspects of a product are essential and feasible to investors (Chen, Yao, & Kotha, 2009; Mollick, 2014). A prepared entrepreneur is seen as having greater ability to develop the venture with the right resources than an unprepared entrepreneur (Chen et al., 2009), and as such high-preparedness projects have better chances of success.

The observed preparedness of the fundraiser cannot entirely ameliorate the adverse selection problem in crowdfunding, however, as the difficulty of the goals set by campaigns vary wildly based on the intrinsic complexity of the campaign itself. Research has shown that the size of the funding goal negatively predicts funding goal attainment in crowdfunding, in part because a high fundraising goal implies more complex operations involved in product development and delivery (Koch & Siering, 2015) and therefore a lower chance of ultimate success. Product development may play a similar role, as crowdfunding campaigns seek to raise money for

products in all phases of development, from unformed ideas to products already selling in the marketplace (Stanko & Henard, 2017).

Products that are early in development are generally untested and thoroughly plagued with the "liabilities of newness" (Fisher, Kotha, & Lahiri, 2016), and thus there is significant technical uncertainty (uncertainty about whether it is feasible for the entrepreneur to build to product they describe; Sapienza & Gupta, 1994) present in the campaigns designed around these projects. Unforeseen complexities (i.e. contingencies that entrepreneurs must address to meet their goals; Davis, Eisenhardt, & Bingham, 2009; Townsend, Hunt, McMullen, & Sarasvathy, 2018) may arise during the course of developing a product that neither the entrepreneur nor the backer foresaw, which can result in projects failing in the aftermath of successful funding by going over budget (Mollick & Kuppuswamy, 2014; Kim & Wilemon, 2003). Moreover, backers cannot make concrete assessments of the functional and aesthetic qualities of a product that they cannot see, and assurances from the fundraiser that the product will have certain features and be of high value could be "cheap talk" (i.e. a signal that indicates the sender possesses qualities they do not actually possess; Connelly, Certo, Ireland, & Reutzel, 2011). Thus, it seems there is variance in probability of entrepreneurial success, and therefore funding outcomes, that cannot be accounted for by preparedness and funding target, but rather by product development.

The challenges associated with campaigns where products are not yet fully developed can be illustrated by a vignette taken from Kickstarter. While single-case studies are not ideal for theory-building (Eisenhardt & Graebner, 2007), they can be useful to illustrate the existence of phenomena in a concrete manner, better setting up the phenomena for rigorous analysis. The following is an example of the technical uncertainty in campaigns where the central product is

not fully developed, meant to describe the risk assumed by backers who fund campaigns supporting unfinished products.

In February 2013, Dr. Tamara Suida launched a Kickstarter campaign to raise the funds necessary to create a daybook calendar featuring the festivals of Ancient Egypt. Dr. Suida is an Egyptologist (a fact verifiable by a visit to Google Scholar), and her campaign offered a product that would be aesthetically pleasing, intellectually stimulating, and shipped in December, in return for funds that would be used to access additional research materials and hire skilled staff to bring the book to life. The campaign passes every "sniff-test"; a descriptive video, no spelling errors, frequent communication with backers, and an idea Dr. Suida had been researching for years. The project received significant support, raising 571% of its $3,000 goal, but was plagued by issues from the very beginning. New research materials brought in to help finish the book were written in a dialect Dr. Suida was unfamiliar with, requiring her to spend extended lengths of time learning new skills to continue the project, and the original illustrator hired to draw the book quit, requiring Dr. Suida to go through the hiring process a second time. While the project was eventually finished and rewards were delivered, the project far exceeded its anticipated delivery timeline, ultimately delivering the promised daybook in 2017, a nearly four-year delay[1].

Using preparedness as the only marker of project quality, it is unlikely that a backer would have anticipated a four-year delay in delivery, based on the thorough planning and exceptional credentials of the entrepreneur overseeing the project. It can therefore be seen from this vignette that campaigns with products early in development carry risks which can only

---

[1] This campaign's webpage can be found at https://www.kickstarter.com/projects/tsiuda/the-ancient-egyptian-daybook/description

partially be mitigated by the skill or preparedness of the entrepreneur. Therefore, backers can be more confident that the vision of a project will be manifested if the product central to the campaign is already fully developed. Therefore, I predict:

Hypothesis 1: Product development will predict fundraising success, such that campaigns featuring a complete product will be more likely to meet or exceed their funding goal than a campaign featuring an incomplete product.

Indirect Effects of Product Development

The information that entrepreneurs can honestly signal in their attempts to win over backers varies based on the development of their offering, as nascent firms in the post-product launch stage have generally accomplished more than firms in the pre-product launch stage (Paschen, 2017; Gartner, 1993). Therefore, other signals commonly sent by campaigns may help explain the hypothesized variation in success rates between the two types of campaigns beyond variation in complexity risks and technical uncertainty (which will not be consciously clear to many prospective backers) and the backer's ability to assess functional qualities based on images provided to them. One additional type of signal often seen to increase fundraising performance in reward-based crowdfunding is third-party endorsement (Courtney, Dutta, & Li, 2017; Mollick, 2013). Professional endorsements of ventures, such as quality awards, expert reviews, and media coverage, have been shown to reduce the effects of quality uncertainty in certain industries (Nicolau & Sellers, 2010) and in venture capital (Shane & Cable, 2002), and prior research has demonstrated that crowdfunders send signals of these professional endorsements with positive effects on funding outcomes (e.g. Mollick, 2013; Calic & Mosakowski, 2016; Courtney, Dutta, & Li, 2017).

I expect professional third-party endorsement to mediate the relationship between product development and funding goal attainment. Campaigns in the pre-product launch stage of the new venture life cycle are less likely to honestly signal professional endorsement, as, on average, they lack the resource capital and record of past action that new ventures can use to attract legitimizing media attention (Lounsbury & Glynn, 2001) and the immaturity of their intellectual capital would attenuate their chances of winning quality awards. Thus, product development will positively predict third-party endorsement, which will in turn positively predict fundraising success.

Hypothesis 2a: Product development will predict professional third-party endorsement, such that campaigns featuring a complete product will be more likely to signal professional endorsement than a campaign featuring an incomplete product.

Hypothesis 2b: The positive effects of product development on funding success are partially mediated by signals of professional third-party endorsement.

While professional attention is the primary third-party endorsement signal studied in crowdfunding research to date, some studies have investigated endorsements from non-professional sources, such as backers leaving comments on campaign pages (Courtney, Dutta, & Li, 2017). Crowdfunding platforms also enable campaigns to signal endorsements from general customers, if the product central to the campaign has been sold to or tested with customers prior to the launch of the campaign (as on other web platforms; e.g. Jalkala & Salminen, 2009). Endorsements of this variety have received minimal study, but literature on entrepreneurial finance suggests they play a potentially important role in backer decision-making.

Examples of customer endorsements that might be signaled in crowdfunding include prior retail sales of the product, community beta testing reviews (common in the gaming and technology project categories), customer testimonials, and general product reviews. The founder's familiarity with the market and customer acceptance of the product are shown to be key to venture capitalist decision making (MacMillan, Zemann, & Subbenarasimha, 1987), indicating that backers might value customer testing of the product as a means to enhance the product's value, and therefore the chance of success of the venture. Customer participation in the development process, via interaction with customers on prior sales or through beta testing, enhances entrepreneurs' ability to determine what information is important to customers, which also leads to increased product value observable by the backer (Fang, Palmatier, & Evans, 2008). Moreover, user reviews and testimonials can influence perceptions of product quality, as research on online reviews indicate that reviews act like signals about the quality of the product central to the review (Hu, Liu, & Zhang, 2008).

As with professional endorsements, I expect customer endorsement to mediate the relationship between product development and funding goal attainment. While campaign teams can interact with customers at any stage of product development, selling and refining product market fit (activities wherein customer interactions are essential) occur primarily in the post-launch phase, rather than the pre-launch phase (Paschen, 2017), making customer interaction more likely if the product has finished development. Furthermore, research on entrepreneurial reputation has shown that past customers are a strong signal of quality to prospective customers (Reuber & Fischer, 2005), and this signal is accessible only to those firms that have a finished product to sell. Prior research suggests that lack of a market is why many campaigns fail to reach their funding goals (Mollick & Kuppuswamy, 2014), but a knowledge that the market is

supportive (i.e. customers endorsing the product) should have the opposite effect and increase

odds of funding success. Thus, product development will positively predict customer

endorsement, which will in turn positively predict fundraising success.

Hypothesis 3a: Product development will predict signals of customer endorsement, such

that campaigns featuring a complete product will be more likely to signal customer endorsement

than a campaign featuring an incomplete product.

Hypothesis 3b: Customer endorsement will predict funding success.

Hypothesis 3c: The positive effects of product development on funding success are

partially mediated by signals of customer endorsement.

Method

Data Set

The data set for this study was comprised of 1,394 Kickstarter projects ended between

September 1st and September 10th 2016. There were 1,453 Kickstarter campaigns completed

during this time frame. Campaigns that were written solely in non-English languages (21) or

which did not provide enough information about the product to assess whether it was finished or

unfinished (6) were removed from the data set, to ensure accurate assessment of preparedness

and product development. Campaigns that were cancelled by the creator within 3 days of

launching (20), suspended by Kickstarter (8), or were cancelled and had all content removed by

the creator (4) were also removed to ensure the dataset represented projects that had meaningful

life spans and conformed to platform rules. All data collected from Kickstarter campaigns are

publicly available. Data on funding goals and outcomes for this time period were collected by

the CrowdDataCenter. Data on preparedness, product development stage, and endorsement

signals were collected manually from the webpages of individual campaigns using the definitions provided in hypothesis development above. The protocol followed for data collection can be found in Appendix A.

This data set was selected for its numerous advantages in eliminating confounding variables. All projects within this contained time period were subject to a common set of rules and affected by a common set of seasonal conditions, reducing the chances that variance observed in this data can be explained by differences in environmental conditions. Moreover, using data only from one platform and platform type eliminates numerous potential confounding variables, although this does also reduce the generalizability of the results to reward-based crowdfunding platforms. Preparedness and funding goal size were added to the model to control for their effects on goal attainment and potential effects on endorsement signals.

Measures

Dependent Variable. The dependent variable of this analysis will be funding goal attainment (i.e. whether or not the campaign met the fundraising goal it stated), drawing from the procedure used by Calic and Mosakowski (2016) and Courtney and colleagues (2015). Goal attainment will be a dichotomous variable indicating whether the campaign successfully raised at least the desired amount (1 = goal attained; 0 = goal not attained).

Independent Variables.

Product Development. Product development is operationalized as a dichotomous variable indicating whether a product was or was not fully functional at the time of launch (1 = fully functional, 0 = not fully functional). Products considered to not be fully functional are those products that are either shown in prototypic form or merely described, and fully functional

products must be aesthetically and technologically complete (for example, a product will be coded as not fully functional if the example product is a 3D-printed model that is lacking color or etching expected on the final product). While generic, this operationalization accommodates the diverse array of products found within categories on Kickstarter. Kickstarter campaigns are strongly suggested to give demonstrations of the product in its current state and are forbidden from altering media to enhance perception of functionality ("Rules for visually representing your product"), meaning representations of product development should generally be honest.

Signals of Professional Endorsement. Professional assessment will be a dichotomous variable indicating whether the campaign reported that their product had been reviewed or covered by a journalist, news agency, industry professional, technical specialist, or credible industry blog, or had received an award, prior to the launch of the campaign (1 = professional endorsement, 0 = no professional endorsement), drawing on the procedure for counting endorsements from Calic & Mosakowski (2016).

Signals of Customer Endorsement. Customer endorsement will be a dichotomous variable indicating whether the campaign asserted that the product had been reviewed by or sold to customers outside the campaign team prior to the launch of the campaign (1 = customer endorsement, 0 = no customer endorsement), drawing on the procedure for counting endorsements from Calic & Mosakowski (2016).

Control Variables.

Preparedness. Preparedness was measured using the technique from Mollick (2014). Campaigns will be checked for three indicators of observable preparedness; the presence of a video (0 = no video, 1 = video present), the presence of updates within three days of the launch date (0 = no updates, 1 = at least one update), and the absence of spelling errors (0 = at least one

spelling error present, 1 = no spelling errors present). Preparedness will be operationalized as an ordinal variable, with possible values from 0 to 3, representing the sum of the three indicators described above, which are reported individually for correlational purposes only.

Ln of Funding Goal. Size of funding goal will be a continuous variable, representing the natural log of the amount, in US dollars, the entrepreneur desired to raise in a specific campaign. Re-expression was necessary given the well-known positive skewness (Manning and Mullahy, 2001) of the distribution of financial variables in crowdfunding data sets, and such re-expression is common in crowdfunding research (e.g. Mollick, 2014; Belleflamme & Lambert, 2014).

Results

Model Testing

Descriptive statistics, correlations and reliability estimates are presented in Table 1. All models were tested with path analysis using AMOS, version 26.0. Maximum-likelihood (ML) estimation was used. All effects were evaluated using standardized regression coefficients. First, the hypothesized model was tested; results of this test indicated that the model fit well [χ^2_1 (n=1394) = 2.1, CFI = .99, TLI = .98. RMSEA = .03]. All parameter coefficients were significant ($p < .05$), thus the hypothesized model was considered a reasonable means to test our hypotheses. Please see Figure 1 for standardized coefficients.

Three alternative models were also tested relating to theoretically relevant alternate conceptualizations of the temporal relationships between the variables in this study (Raykov & Marcoulides, 2006). Table 2 shows the fit statistics from all tested models. The first model tested (Alternative Model 1) was a reverse causality model, wherein endorsements predicted product development, preparedness, and funding goal size. Funding goal attainment remained the final outcome variable, as goal attainment physically cannot precede the other variables, and

thus is irrelevant as a predictor of the other study variables. This model demonstrated poor fit

[χ^2_1 (n=1394) = 225.2, CFI = .76, TLI = -.198, RMSEA = .23], and thus was judged to fit the

data poorly compared to the hypothesized model. Alternative model 2 tested a full mediation

model, wherein product development, preparation, and funding goal effect goal attainment only

via professional and customer endorsement. This model would reflect the theoretical position

that the crowd as an aggregate does not consider risk in its funding decisions in the manner of an

traditional investor, and therefore acts like customers (treating crowdfunding as a lifestyle, rather

than investment, alternative; Townsend & Hunt, 2019), treating investments like purchases and

using reviews to guide their decision as an online customer might (Hu, Liu, & Zhang, 2008).

This model also demonstrated poor fit [χ^2_4 (n=1394) = 376.9, CFI = .598, TLI = -.508, RMSEA

= .26], and thus was judged to fit the data poorly compared to the hypothesized model. Finally,

alternative Model 3 tested a double-mediation model wherein preparedness predicted funding

goal success via product development and endorsements, and size of funding goal was held as a

control variable. Preparedness indicates ability to take a venture forward (Chen et al., 2009),

therefore preparedness could predict product development and the goals set by companies for

their development (i.e. funding goal) by dictating the extent to which product development is

successful and the ability to set reasonable goals for the venture. However, this model also

demonstrated poor fit [χ^2_5 (n=1394) = 253.6, CFI = .732, TLI = .196, RMSEA = .19]; therefore,

the original model was deemed the best model to test this study's hypotheses.

Hypothesis Testing

Hypotheses 1, 2a, and 3a were tested by examining the standardized parameter

coefficients of the hypothesized model. The coefficient from product development to goal

attainment (β = .058, p = .017), professional endorsement (β = .227, p < .001), and customer

endorsement (β = .335, p < .001), and from customer endorsement to goal attainment (β = .079, p = .001) were significant and in the hypothesized direction; therefore, hypotheses 1, 2a, 3a, and 3b were fully supported. Bootstrap analyses for estimating indirect effects with 2,000 bootstrapped samples were used to test hypotheses 2b and 3c. This method provides benefits over regression testing (e.g. Baron & Kenny, 1986) due to corresponding confidence intervals that are not normally distributed (Shrout & Bloger, 2002). The standardized indirect effects of product development on goal attainment via professional & customer endorsement (M = .065, p <.001, $CI_{90\%}$ = .048, .083); therefore, hypotheses 2b and 3c were supported as well.

Discussion

The purpose of this research was to examine how the development of the featured product affects fundraising in reward-based crowdfunding, and whether this effect is partially explained by signals demonstrating third-party endorsement of the product to prospective backers. Consistent with expectations, product development positively predicted funding success, and predicted professional and customer third-party endorsement. Moreover, the endorsements from professional reviewers and customers partially mediated the effects of product development on funding goal attainment. As such, all hypotheses were supported. These findings add meaningful depth to the literature on crowdfunding, clarifying when crowdfunding is most fruitful for organizations attempting to access capital.

Theoretical and Practical Implications

This finding has clear implications for fundraisers; namely that finishing your product and having meaningful interaction with customers and/or professional reviewers improves your odds of success raising the desired capital. With less technical uncertainty, more direct evidence of product quality, and more external validation, discriminating backers can be more confident

that they are investing in a project that has an above-average chance of succeeding when the product is fully developed (Mollick, 2014). If an organization needs external capital to develop and launch their product, crowdfunding remains an option; however, entrepreneurs should be prepared for a harder road to capital if their product remains unfinished.

These findings have noteworthy implications for scholars as well. First, the inclination of the crowd to fund well developed, externally validated ideas limits the ability of crowdfunding to address the early end of the "funding gap" in nascent venturing (Townsend & Hunt, 2019). It does not appear that this inclination is as strong as it is in traditional entrepreneurial finance; however, these findings suggest that is unlikely that crowdfunding replaces the 4Fs (founders, friends, family, and fools) as the primary mode of pre-launch finance (Kotha & George, 2012). While crowdfunding does afford pre-launch organization access to capital, these firms remain at a disadvantage relative to post-launch organizations despite the crowd's differences from traditional financial institutions.

Additionally, the finding that product development predicts third-party endorsements adds depth to the literature on these signals in crowdfunding contexts. Consistent with prior study of legitimizing signals, this research shows that endorsement signals vary not only based the quality of the organization, but also by the past actions (or lack thereof) of the organizations sending them (Lounsbury & Glynn, 2001), compounding the difficulties confronting pre-product launch organizations. Moreover, third-party endorsements originating with customers have positive effects on funding goal attainment similar to endorsements originating from news outlets and professional reviewers. With the prominence of pre-selling on Kickstarter (Mollick, 2014), backers of some campaigns play dual roles as both investor and customer. Consistent with research that finds herding effects (group imitation behavior amongst customers) from reviews in

online product choice (Huang & Chen, 2006; Mudambi & Schuff, 2010), this study provides evidence that support from prior customers positively influences funding outcomes.

Limitations and Future Research

While this study has meaningful implications for scholars and practitioners in understanding the drivers of success in crowdfunding, this study also has limitations that must be discussed. First and foremost, data on third-party endorsement was collected manually using a protocol based on prior research (e.g. Mollick, 2013; Calic & Mosakowski, 2016) but developed specifically for this study. Campaign pages, the source of the data for this study, are often formatted in a confusing manner and the central product of a campaign is not always self-evident. Moreover, signal observation is an inherently messy phenomenon, influenced by the attention-control of the observer and the nature of the signals themselves (Drover, Wood, & Corbett, 2018). Given these facts, a researcher doing systematic search may observe signals that go unnoticed by many backers. The strict use of a structured protocol for data collection based in prior research mitigates variation in data collection; however, future research that explores the cognitive component of signal observation (e.g. an experiment including variation in signal fit and strength; Connelly et al., 2011) would allow more precise study of these signals in the future.

Second, trust between backers and entrepreneurs was not assessed in this study. Receiver interpretation of signals (e.g. about product development or endorsement) is important to fundraiser-backer exchange (Connelly et al., 2011). This finding suggests that the role of the product itself in fundraiser-backer exchange has not received sufficient scholarly attention. The social orientation and perceived creativity of the product (e.g. Moss, Renko, Block, & Mysekens, 2018; Moss, Neubaum, & Mysekens, 2015 Davis, Hmieleski, Webb, & Coombs, 2017) are among the few product characteristics studied in the literature, and product development has not

been examined to date that the author is aware of. Future research should examine how alignment between the claims made by fundraisers about their products (e.g. their current functionality) and the demonstrations they provide as evidence for those claims affects funding, as the findings of this study suggest the crowd is at least somewhat skeptical (consciously or not) of products they cannot see in action, and juxtaposing a lack of demonstration with grandiose claims of quality may foster mistrust. Research on entrepreneur-investor relationships show that consistent and honest communication is key to beneficial exchange between the two parties (Sheppard & Zacharakis, 2001), and unsupported claims may undermine this trust in some backers.

Future research should also compare the pre/post-launch disparity in crowdfunding to those found in other funding sources and evaluate whether pre-launch firms are significantly more likely to receive needed funding with crowdfunding available than unavailable. Research suggests that many of the entrepreneurs who raise money from the crowd do so not due to of lack of financing options, but because the crowd provides capital at a lower cost (both financial and personal) than other sources (Agarwal et al., 2014), calling into question crowdfunding's unique benefit to entrepreneurs. Studies examining this question to date have not included development stage of the firm in their analysis, however; therefore, it stands to reason that the pre-launch and highly specialized (Townsend & Hunt, 2019) firms who crowdfund successfully would have limited access to capital beyond the 4Fs if modern crowdfunding did not exist.

Conclusion

In summary, this paper sheds additional light on the determinants of fundraising performance in reward-based crowdfunding. Specifically, product development influences goal attainment directly, as well as indirectly via third-party endorsements. Entrepreneurs who seek

to use crowdfunding exclusively to raise capital should be advised that a well-developed offering that has been tested by outside parties, along with a high-quality presentation and reasonable monetary target, is the offering most likely to be looked on favorably by the crowd. While crowdfunding is accessible to organizations in the pre-product launch phase and confers non-financial benefits at all phases of product development, it appears that pre-product launch firms remain at a disadvantage in crowdfunding markets.

References

Agarwal, A., Catalini, C., & Goldfarb, A. (2014). Some simple economics of crowdfunding. *Innovation Policy and the Economy*, *14*(1), 63-97.

Allison, T. H., Davis, B. C., Short, J. C., & Webb, J. W. (2015). Crowdfunding in a prosocial microlending environment: Examining the role of intrinsic versus extrinsic cues. *Entrepreneurship Theory and Practice*, *39*(1), 53-73.

Barron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychology research: Conceptual, strategic, and statistical consideration. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Belleflamme, P., & Lambert, T. (2014). Crowdfunding: Some empirical findings and microeconomic underpinnings. *Available at SSRN 2437786*.

Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, *29*(5), 585-609.

Burtch, G., Ghose, A., & Wattal, S. (2011). An empirical examination of the antecedents of contribution patterns in crowdfunded markets.

Calic, G., & Mosakowski, E. (2016). Kicking off social entrepreneurship: How a sustainability orientation influences crowdfunding success. *Journal of Management Studies*, *53*(5), 738-767.

Captain, S. (2018, April 13). Indiegogo Says It's Raised Close To $1.5 Billion For Projects, And Will Soon Turn A Profit. Retrieved from https://www.fastcompany.com/40555905/indiegogo -says-its-raised-close-to-1-5-billion-for-projects-may-turn-a-profit-next-year

Chemla, G., & Tinn, K. (2019). Learning through crowdfunding. *Management Science*. https://doi.org/10.1287/mnsc.2018.3278

Chen, X. P., Yao, X., & Kotha, S. (2009). Entrepreneur passion and preparedness in business plan presentations: a persuasion analysis of venture capitalists' funding decisions. *Academy of Management Journal*, *52*(1), 199-214.

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39-67.

Courtney, C., Dutta, S., & Li, Y. (2017). Resolving information asymmetry: Signaling, endorsement, and crowdfunding success. *Entrepreneurship Theory and Practice*, *41*(2), 265-290.

Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2009). Optimal structure, market dynamism, and the strategy of simple rules. *Administrative Science Quarterly*, *54*(3), 413-452.

Davis, B. C., Hmieleski, K. M., Webb, J. W., & Coombs, J. E. (2017). Funders' positive affective reactions to entrepreneurs' crowdfunding pitches: The influence of perceived product creativity and entrepreneurial passion. *Journal of Business Venturing*, *32*(1), 90-106.

Drover, W., Wood, M. S., & Corbett, A. C. (2018). Toward a cognitive view of signalling theory: individual attention and signal set interpretation. *Journal of Management Studies*, *55*(2), 209-231.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, *14*(1), 57-74.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*(1), 25-32.

Fang, E., Palmatier, R. W., & Evans, K. R. (2008). Influence of customer participation on creating and sharing of new product value. *Journal of the Academy of Marketing Science*, *36*(3), 322-336.

Fisher, G., Kotha, S., & Lahiri, A. (2016). Changing with the times: An integrated view of identity, legitimacy, and new venture life cycles. *Academy of Management Review, 41*(3), 383-409.

Freear, J., Sohl, J. E., & Wetzel, W. (2002). Angles on angels: financing technology-based ventures-a historical perspective. *Venture Capital, 4*(4), 275-287.

Galak, J., Small, D., & Stephen, A. T. (2011). Microfinance decision making: A field study of prosocial lending. *Journal of Marketing Research*, *48*(SPL), S130-S137.

Gartner, W. B. (1993). Words lead to deeds: Towards an organizational emergence vocabulary. *Journal of Business Venturing*, *8*(3), 231-239.

Gerber, E. M., Hui, J. S., & Kuo, P. Y. (2012, February). Crowdfunding: Why people are motivated to post and fund projects on crowdfunding platforms. In Proceedings of the international workshop on design, influence, and social technologies: techniques, impacts and ethics (Vol. 2, No. 11, p. 10). Northwestern University Evanston, IL.

Huang, J. H., & Chen, Y. F. (2006). Herding in online product choice. *Psychology & Marketing*, *23*(5), 413-428.

Hu, N., Liu, L., & Zhang, J. J. (2008). Do online reviews affect product sales? The role of

reviewer characteristics and temporal effects. *Information Technology and Management*, *9*(3), 201-214.

Jalkala, A., & Salminen, R. T. (2009). Communicating customer references on industrial companies' Web sites. *Industrial Marketing Management*, *38*(7), 825-837.

Kickstarter. (2020, April 25). Kickstarter Stats. Retrieved from https://www.kickstarter.com/help/stats

Kickstarter. (n.d.). Rules for visually representing your project. Retrieved on April 25th, 2020, from https://www.kickstarter.com/honest#visual-presentation

Kim, J., & Wilemon, D. (2003). Sources and assessment of complexity in NPD projects. *R&D Management*, *33*(1), 15-30.

Kim, L. (2018, August 6). Top 10 Crowdfunding Platforms of 2018. Retrieved from https://www.inc.com/larry-kim/op-10-crowdfunding-platforms-of-2018.html

Koch, J. A., & Siering, M. (2015). Crowdfunding success factors: the characteristics of successfully funded projects on crowdfunding platforms: SSRN Working Paper.

Kotha, R., & George, G. (2012). Friends, family, or fools: Entrepreneur experience and its implications for equity distribution and resource mobilization. *Journal of Business Venturing*, *27*(5), 525-543.

Kuppuswamy, V., & Bayus, B. L. (2013). Crowdfunding Creative Ideas: the Dynamics of Projects Backers in Kickstarter: SSRN Working Paper.

Kuppuswamy, V., & Bayus, B. L. (2017). Crowdfunding creative ideas: The dynamics of project backers in Kickstarter. In L. Hornuf, and D. Cummings (Eds.), *"The Economics of Crowdfunding: Startups, Portals, and Investor Behavior"*

Lounsbury, M., & Glynn, M. A. (2001). Cultural entrepreneurship: Stories, legitimacy, and the acquisition of resources. *Strategic Management Journal*, *22*(6-7), 545-564.

MacMillan, I. C., Siegel, R., & Narasimha, P. S. (1985). Criteria used by venture capitalists to evaluate new venture proposals. *Journal of Business Venturing*, *1*(1), 119-128.

MacMillan, I. C., Zemann, L., & Subbanarasimha, P. N. (1987). Criteria distinguishing successful from unsuccessful ventures in the venture screening process. *Journal of Business Venturing*, 2(2), 123-137.

Manning, W. G., & Mullahy, J. (2001). Estimating log models: to transform or not to transform?. *Journal of Health Economics*, *20*(4), 461-494.

McKenny, A. F., Allison, T. H., Ketchen Jr, D. J., Short, J. C., & Ireland, R. D. (2017). How should crowdfunding research evolve? A survey of the entrepreneurship theory and practice editorial board. *Entrepreneurship Theory and Practice*, *41*(2), 291-304.

Mollick, E. (2013). Swept away by the crowd? Crowdfunding, venture capital, and the selection of entrepreneurs. *Venture Capital, and the Selection of Entrepreneurs (March 25, 2013)*.

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, *29*(1), 1-16.

Mollick, E., & Nanda, R. (2016). Wisdom or madness? Comparing crowds with expert evaluation in funding the arts. *Management Science*, *62*(6), 1533-1553.

Mollick, E. R., & Kuppuswamy, V. (2014). After the campaign: Outcomes of crowdfunding. *UNC Kenan-Flagler Research Paper*, (2376997).

Moritz, A., & Block, J. H. (2016). Crowdfunding: A literature review and research directions. In *Crowdfunding in Europe* (pp. 25-53). Springer, Cham.

Moss, T. W., Neubaum, D. O., & Meyskens, M. (2015). The effect of virtuous and entrepreneurial orientations on microfinance lending and repayment: A signaling theory perspective. *Entrepreneurship Theory and Practice*, *39*(1), 27-52.

Moss, T. W., Renko, M., Block, E., & Meyskens, M. (2018). Funding the story of hybrid ventures: Crowdfunder lending preferences and linguistic hybridity. *Journal of Business Venturing*, *33*(5), 643-659.

Mudambi, S. M., & Schuff, D. (2010). Research note: What makes a helpful online review? A study of customer reviews on Amazon. com. *MIS quarterly*, 185-200.

Nicolau, J. L., & Sellers, R. (2010). The quality of quality awards: diminishing information asymmetries in a hotel chain. *Journal of Business Research*, *63*(8), 832-839.

Paschen, J. (2017). Choose wisely: Crowdfunding through the stages of the startup life cycle. *Business Horizons*, *60*(2), 179-188.

Petty, J. S., & Gruber, M. (2011). "In pursuit of the real deal": A longitudinal study of VC decision making. *Journal of Business Venturing*, *26*(2), 172-188.

Raykov, T., & Marcoulides, G. A. 2006. On multilevel model reliability estimation from the perspective of structural equation modeling. *Structural Equation Modeling 13,* 130-141.

Reuber, A. R., & Fischer, E. (2005). The company you keep: How young firms in different

competitive contexts signal reputation through their customers. *Entrepreneurship Theory and Practice*, *29*(1), 57-78.

Sapienza, H. J., & Gupta, A. K. (1994). Impact of agency risks and task uncertainty on venture capitalist–CEO interaction. *Academy of Management Journal*, *37*(6), 1618-1632.

Shane, S. A. (2008). *The illusions of entrepreneurship: The costly myths that entrepreneurs, investors, and policy makers live by*. Yale University Press.

Shepherd, D. A., & Zacharakis, A. (2001). The venture capitalist-entrepreneur relationship: control, trust and confidence in co-operative behaviour. *Venture Capital, 3*(2), 129-149.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological Methods*, *7*(4), 422.

Stanko, M. A., & Henard, D. H. (2017). Toward a better understanding of crowdfunding, openness and the consequences for innovation. *Research Policy, 46*(4), 784-798.

Stiglitz, J. E. (2000). The contributions of the economics of information to twentieth century economics. *The Quarterly Journal of Economics*, *115*(4), 1441-1478.

Townsend, D. M., Hunt, R. A., McMullen, J. S., & Sarasvathy, S. D. (2018). Uncertainty, knowledge problems, and entrepreneurial action. *Academy of Management Annals*, *12*(2), 659-687.

Townsend, D. M., & Hunt, R. A. (2019). Demand-side perspectives on the democratization of finance through crowdfunding: opportunities and challenges for early-stage finance research. In *Handbook of Research on Crowdfunding*. Edward Elgar Publishing.

Vismara, S. (2018). Signaling to overcome inefficiencies in crowdfunding markets. In D. Cumming & L. Hornuf (Eds.), *The Economics of Crowdfunding* (pp. 29-56). Palgrave Macmillan, Cham.

Table 1

Means, Standard deviations, correlations, and reliability estimates for hypothesized & control variables.

		Mean	S.D.	1	2	3	4	5	6	7	8	9
1	**Video**	0.67	0.47	-								
2	**Correct Spelling**	0.60	0.49	.07**	-							
3	**Quick Update**	0.33	0.47	.18**	.04	-						
4	**Preparedness**	1.60	0.90	.65**	.60**	.64**	-					
5	**Ln(Funding Goal)**	8.78	1.71	.17**	.05	-.02	.11**	-				
6	**Product Development**	0.31	0.46	.16**	.04	.18**	.20**	-.04	-			
7	**Customer Endorsement**	0.10	0.31	.15**	.06*	.14**	.19**	.06*	.36**	-		
8	**Professional Endorsement**	0.07	0.26	17.**	.04	.20**	.22**	.14**	.25**	.17**	-	
9	**Funding Goal Attainment**	0.34	0.47	.24**	.12**	.40**	.40**	-.26**	.21**	.18**	.23**	-

Notes. N = 1394. **p* < .05. ***p* < .01. Product Development (0 = unfinished, 1 = finished); Funding Goal Attainment, (0 = goal not reached, 1 = goal reached); Video, Correct Spelling, Quick Update, Intellectual Capital, Customer Endorsement, Professional Endorsement (0 = signal not present, 1 = signal present)

Table 2

Chi-square difference tests and fit indices for hypothesized and alternative models

Model	χ^2	df	$\Delta\chi^2$	Δ df	CFI	TLI	RMSEA
Hypothesized Model	2.1	1	-	-	.99	.98	.03
Alternative Model 1	225.2	1	223.1*	-	.76	-.20	.23
Alternative Model 2	276.9	4	274.8*	3	.60	-.51	.26
Alternative Model 3	253.6	5	251.5*	4	.73	.20	.19

Notes. n = 1,394. $\Delta\chi^2$ = chi-square difference. Δ df = difference in degrees of freedom. CFI = comparative fit index. TLI = Tucker-Lewis index. RMSEA = root mean square of approximation.

Figure 1- *Hypothesized Model*
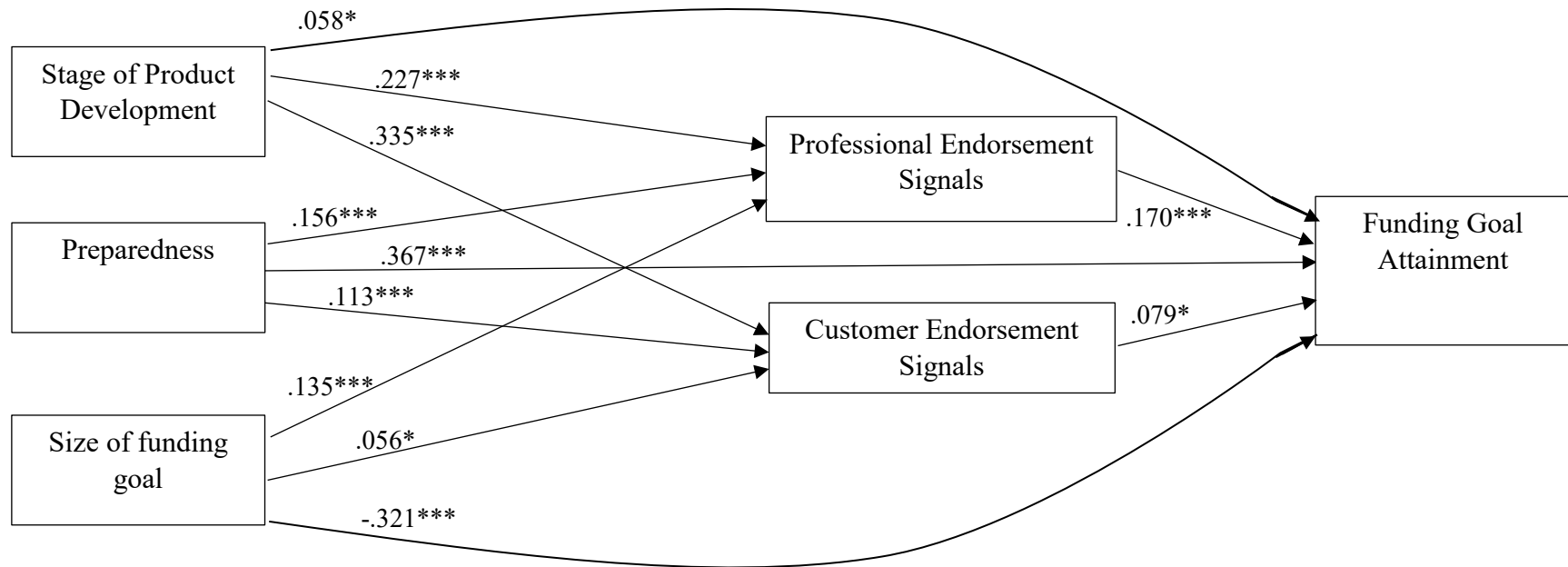
Standardized coefficients

*p<.05, ***p<.001

Appendix A: Data Collection Protocol

Step 1: Follow the first link to be taken to the webpage of a Kickstarter campaign that ended in September of 2016.

Step 2: Does campaign have a video? If so, record a 1 in the column headed by "QC 1: Video," and if not, record a 0. Typically, the video is one of the first things you see on a campaign's page.

NOTE: Only count videos that give an overview of the whole project.

Step 3: Copy and paste all of the text from the "Campaign" page into a blank Microsoft Word document ("keep text only") and spell-check it. If there are no spelling errors in the text, record a 1 in the column headed by "QC 2: Spelling", and if there are spelling errors, record a 0.

NOTE: Ignore proper names and jargon, as they are often correct but are highlighted by Word anyway. Also, do not count grammatical items, such as misusing commas; we are looking strictly at spelling. Words obviously misspelled intentionally for comedic effect or spelled with the British spelling (e.g. "humour") also should <u>not</u> be counted as spelling errors.

Step 4: Navigate to the "Updates" tab on the campaign's web page. If there are no updates, record a 0 in the "QC 3: Updates" column and move to the next step. If there are updates, scroll down so that you can see the first updates given by the creator, hitting "show more updates" if necessary, to see them all. If the creator provided 1 or more updates during the first 3 days of the campaign (within three days of the date from the "Date Added" column for this campaign), record a 1 in this column. If not (Ex. The first update to a project begun on August 1st was provided on August 5th), record a 0 in this column.

Step 5: Read the text in the "Campaign" page and watch the campaign video (if one is present) and ascertain whether the product at the core of the campaign was complete (i.e. fully functional and assembled in the manner it will be sold in) or incomplete while the campaign was running. Examples of products that are incomplete include;

-Prototypes or demonstrations that do not have all the features (functional and aesthetic) promised in the final product

-New ideas or extensions of old concepts that have not yet been physically rendered

Please note that some campaigns will raise money to begin selling an existing product with a new revenue model (e.g. selling a food item through a monthly subscription rather than a storefront). These are <u>complete</u> products, since the products already exist in their final form. If the product is complete, record a 1 in the column "PD" and if not, record a 0.

Step 6: Determine whether the campaign shows that customers have positively interacted with the product. Examples of indicators that customers have seen the product include customer testimonials or reviews, sales of the product before the campaign began, mention of retail locations, beta testing, community play-testing, etc. If the campaign does show customer interaction, record a 1 in the column "CI", and if it does not, record a 0.

NOTE- make sure reviews accompany THIS product, not a prior one, as many campaigns include positive reviews from previous successful products.

Step 7: Determine whether there is evidence of endorsement of the product by professionals. Examples of professional endorsement include positive feedback from consultants or professionals at trade shows, awards at design competitions, and reviews or coverage from journalists, news outlets, reputable bloggers, and field professionals. If such evidence exists, record a 1 in the column "PA", and if it does not, record a 0.

Step 8: Repeat this process with each URL.