

DILEMMAS OF PLATFORM STARTUPS

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Abstract

This paper explores the strategic problems of platform startups on the Internet: their identification and discovery of linkages between them form its contribution to the platform literature. The author argues that the chicken-and-egg problem cannot be solved solely with pricing in the online context – in fact, setting the price zero will result in a monetization dilemma, whereas drawing users from dominant platforms sets the startup vulnerable to their strategic behavior, a condition termed remora's curse. To correctly approach strategic problems in the platform business, startup entrepreneurs should consider them holistically, carefully examining the linkages between strategic dilemmas and their solutions.

Keywords: platforms, two-sided markets, startups, chicken-and-egg problem

1. Introduction

1.1 Research gap

Approximately a decade ago, platforms began to receive the attention of scholars. Entering the vocabulary of economics, two-sided markets (Rochet & Tirole 2003) have become the focus of increased research interest in the field of industrial economics. The recent surge of platforms has been observed across industries, and businesses have swiftly adopted the platform strategy and terminology (Hagiu 2009). Eisenmann, Parker, and Van Alstyne (2011, 1272) found that “*60 of the world's 100 largest corporations earn at least half of their revenue from platform markets.*” Related terms such as *app marketplaces* and *ecosystem* have gained popularity in other fields (see Jansen & Bloemendal 2013). Overall, the implications of two-sidedness have spread from economics to other disciplines such as information systems (Casey & Töyli 2012), strategic management (Economides & Katsamakas 2006), and marketing (Sawhney, Verona, & Prandelli 2005).

However, much remains to be discovered, in particular regarding platform development (Piezunka 2011). These issues are more closely associated with the platform business model than generic business problems that apply across industries and firm sizes. Problems such as a lack of marketing, running out of funds, changes in the business environment or macro-economy, or management errors have been considered in the extant literature (e.g., Miller 1977; Gaskill, Van Auken, & Manning 1993; Lussier 1996; Dimitras, Zanakis, & Zopounidis 1996). Similarly, there are multiple studies dedicated to challenges faced by new ventures or startups (e.g., McCarthy et al. 1981; Zacharakis 1999; Honjo 2000; Azoulay & Shane 2001), and particularly in the online context (Han & Noh 1999; Cochran, Darrat, & Elkhali 2006). However, the strategic problems concerning platforms are less known.

First, not much is known concerning platform-specific business problems beyond the chicken-and-egg dilemma. Despite some extensions to other strategic issues, the chicken-and-egg problem is perceived as the fundamental issue in platform business (Evans 2002; Rochet & Tirole 2003). However, as this study shows, there are other dilemmas which can be deemed equally important for platform firms.

Second, the perspective taken in the platform literature often neglects the startup condition, mainly regarding the lack of resources or pricing power. This tradition can be seen to stem from Farrell and Saloner (1985) and Katz and Shapiro (1985), often cited by platform scholars, who focus on industry standards and “monoliths”, not startup firms. Exceptions in the more recent literature are Caillaud and Jullien (2003), Evans (2009a), Evans and Schmalensee (2010), and Mas and Radcliffe (2011) who consider the chicken-and-egg problem particularly from a startup/entrant perspective. However, when strategies for solving the chicken-and-egg problem focus on pricing (e.g., Caillaud & Jullien 2003) and advertising, they might not be effective for startups lacking the means to execute either.

Third, most studies relating to the chicken-and-egg problem are theoretical. Mas and Radcliffe (2011) and Raivio and Luukkainen (2011) are exceptions as they approach the problem through an empirical case study. Curchod and Neysen's (2009) working paper is methodologically closest to this study as it also applies GT. Although theoretical and analytical works have intuitive appeal, empirical studies can help ground their concepts more firmly in the reality of platform business.

Fourth, without closer examination on associated problems relating to its antecedents or arising from its potential solutions, the chicken-and-egg problem is typically treated as being isolated. Such a narrow focus concerns most other strategic problems in the platform literature. Strategy scholars such as Lyles and Howard (1988) discuss interrelatedness of strategic problems. Thus, a more holistic approach recognizing the linkages between strategic problems and their solutions is needed.

Fifth, strategic solutions considered by the economist-dominated platform literature are narrow and focus mostly on pricing (Shy 2011). The importance of pricing in the online environment is negligible as *de facto* pricing of many online platforms

approaches zero in terms of both access and usage fees (Teece 2010). Rochet and Tirole (2005), for example, make a case proving that a platform can offer negative pricing to one market side and remain profitable overall as a consequence of what Evans (2003) terms “internalizing the externalities” of platform coordination. However, if entry pricing is set at zero and the platform is *still* unable to attract users, what can be done? It seems that answering this question requires an answer not centered on pricing strategies.

1.2 Purpose and research questions

This purpose of this study is to address some of the previously mentioned research gaps with appropriate research questions, and, in so doing, improve the chances of platform startups to identify and solve central strategic problems pertaining to the platform business model, thereby also increasing their chances of survival.

The research problem can be formulated as the following research questions¹:

RQ 1: What strategic problems are encountered by early-stage online platforms?

RQ 2: How can the problems be conceptualized as dilemmas?

RQ 3: Are the dilemmas interrelated? If so, how?

The research questions therefore relate to strategic problems of platform startups, which are conceptualized as dilemmas. The interrelations of these dilemmas are examined, and the study analyzes their potential solutions. Due to the aforementioned high failure rate, it is meaningful to conduct such a study that aims at improving the survival rate of platform startups by providing knowledge on potential challenges they are likely to face, and also offering a basis for solution building.

By asking the first research question, the study extends beyond the chicken-and-egg problem, and shows that there is more depth and complexity in platform dilemmas than is generally considered in the literature. The study challenges the simplification of “*getting both sides on board*” as a solution (Evans 2002), and argues that even if this is accomplished, a platform does not necessarily fulfill the financial necessity of becoming profitable.

The second research question deals with conceptualization. Conceptualization facilitates communication of strategic problems, their further use, and theory generation (Glaser 2002). Communication of novel concepts takes place both among practitioners and scholars, and is crucial for development of business practices. Instead of constantly reformulating the same problem, scholars and practitioners are

¹ Note that, due to the inductive nature of the study, the precise questions were formulated after the analysis. Whatever their initial form, theoretical sampling of grounded theory tends to reshape research questions (Urquhart, Lehmann, & Myers 2010).

able to identify the situation in other contexts, and therefore also consider general and particular solutions in their own context. When a theoretical concept has reached a state of general knowledge within a field, communication relating to the phenomenon becomes more efficient and advanced (Hunt 2002).

Furthermore, the identification, conceptualization, and analysis of platform-specific strategic problems is a worthwhile research purpose because the formulation of strategic problems influences the solution process² (Ackoff 1969; Lyles 1981). As pointed out by strategic management scholars, strategic issues are rarely isolated cases, and merit a wider perspective. By thoroughly understanding the problem and its associations, founders are able to elicit appropriate solutions (Lyles & Howard 1988). By careful conceptualization (i.e., naming and defining) of the strategic problems, this study raises the abstraction level and provides a deep insight on them.

The importance of the research purpose can be shown in many ways. Generally, it is accepted that startup companies are important for the economy (Audretsch & Acs 1994): they create a large share of new jobs (Kane 2010), develop innovations to improve people's lives (Almeida, Dokko, & Rosenkopf 2003), redeploy resources by creative destruction (Schumpeter 1961), fill gaps in customer needs, and tackle problems efficiently and relentlessly from new perspectives (Shepherd & Kuratko 2009). Therefore, a study aimed at improving the conditions upon which startups will thrive can be regarded as important for society as a whole, as well as entrepreneurs and managers of platform startups.

2. Methodology

2.1 General description

This study aims to answer the research questions by creating a substantive theory (see Glaser & Strauss 1965) on strategic problems of platform startups on the Internet. This is accomplished by conceptualizing and increasing the abstraction level of the analyzed post-mortem stories. The grounded theory (GT) methodology, outlined by Glaser and Strauss (1967) is applied as an instrument of data collection and analysis.

Grounded theory is a *set of methods* to systematically analyze empirical material (Finch 2002). This data can be both quantitative and qualitative (Glaser 2004), although GT is most often associated with qualitative data (Kempster & Parry 2011). Partington (2000) notes that the foundations of GT include *theoretical sampling*, or a process of data collection guided by the emerging theory and *constant comparison*, or

² Ackoff's (1969) *elevator problem* is a good example: if waiting for an elevator is defined as a technical problem, the company needs to engineer faster elevators. If, however, it is defined as a behavioral problem, people can be given an activity while they are waiting.

simultaneous coding and analysis of data. Suddaby (2006, 634) confirms this perspective, and adds that “[b]oth concepts violate longstanding positivist assumptions about how the research process should work.” This contradiction relates to the method’s history of countering deductive methods in favor of theory generation from data (see e.g., Locke 1996, for a more detailed discussion).

By nature, GT is an *inductive*³ method, intended to help the researcher elicit answers to his or her research problem from the empirical material (Eisenhardt 1989). Contrary to deductive reasoning, in which the presumptions are stronger and the researcher is narrowing the scope of inquiry, in inductive logic, the scope of inquiry is broader and central issues are gradually revealed by scrutiny, which in GT is represented by the coding process (Strauss & Corbin 1994). Eisenhardt (1989, 541) points out that, in inductive studies, “*researchers constantly compare theory and data-iterating toward a theory which closely fits the data.*” This fit between data and emerging concepts is perceived as important because it reduces the risk of the latter being detached from empirical relevance (Eisenhardt 1989).

GT is particularly useful when data are in qualitative form and the researcher still seeks a systematic methodology (Glaser 2004). GT gives good grounds for conceptualization and raising central topics and patterns from the data (Charmaz 1990). These features are compatible with the objectives of this study; thus, GT provides a good methodological match for solving the research problem.

The researcher was interested in problems of post-dotcom Internet startups, a phenomenon not well studied. When there are no exact presumptions and the research topic is quite new, a method aiming to *discover central topics* is beneficial (Glaser 1978). According to Finch (2002, 220), grounded theory fits well with “*the development of novel knowledge claims of under-researched phenomena.*” As identified in the previous chapter, there are several gaps relating to platform-creation activities, and managers actively seek to understand why particular strategies work while others do not. To determine the answer, theoretical analysis is needed.

The extant platform literature has approached the chicken-and-egg problem (i.e., *getting both sides on board*) mainly from the pricing perspective, and focused on analytical modeling (Piezunka 2011). Few inductive studies have been conducted to understand the roots of the problem (e.g., Birke 2008). This study provides a step in that direction. As will be shown, mere pricing (i.e., levels or structure) is insufficient as a solution to the cold start problem; in fact, several studied startups offered their products *for free*, and still failed to gain growth. The lack of participation is only partially explained by overly high prices; fundamentally, it is a much more complex phenomenon. This study is geared towards the interpretations of failed startup founders. In these stories, founders explain why their ventures failed. The inductive

³ Note that by ‘inductive method’, an inductive *tendency* or emphasis is implied. Pure induction and pure deduction, for that matter, are generally considered impossible; new ideas arise from their combination, or *abduction* (Suddaby 2006).

nature of the study will provide a needed empirical grounding for the treatment of strategic problems.

2.2 Data collection

The analyzed material comprises 29 failure reports by founders of failed startups. The narratives, or “post-mortems” as termed by startups, were written by founders to reflect the startup’s failure, in particular to identify reasons for that failure. Thus, post-mortem is defined here as *a story analyzing a failed startup venture*. The stories were collected from the Internet by following links from various blog articles listing and publishing post-mortem analyses, and conducting searches via Google search engine and two startup-centered online communities.

Keyword phrases for Web searches included:

- startup failure story
- startup postmortem/post-mortem
- startup failure analysis
- business postmortem/post-mortem
- business failure analysis.

The data collection process began by gathering all post-mortem stories the researcher could find. The search was conducted by finding aggregated blog-posts listing startup failure stories and then following links to original posts, similar to “snowball” sampling (see Biernacki & Waldorf 1981), and by performing Web search queries. In particular, ChubbyBrain (2011) contained links to several post-mortem stories. Following links, post-mortem stories were captured for further filtering and analysis. Additionally, Google was utilized to find post-mortems; this is because Google’s search algorithms tend to be the most accurate of current search engines (Uyar 2009), and its index of Web pages is commonly judged as current and extensive (e.g., Gulli & Signorini 2005).

Moreover, searches were conducted on two startup-focused online communities: Quora⁴ and Hacker News⁵. These communities contain a substantial number of discussions relating to Web startups, and also included discussion threads on startup failure. Reading these discussions helped the researcher to become familiarized with the phenomenon and find links to still new post-mortem stories.

To deepen the knowledge on the sampled startups, the comment sections of the post-mortem stories were read; the stories were published in blogs, and therefore could be commented upon. There were some cases in which other founders

⁴ www.quora.com

⁵ news.ycombinator.com

participated by questioning parts of the analysis or by sharing their own stories. In addition, in a couple of cases, customers disagreed with the story, and also the content suppliers of one startup were bitter (i.e., in platform terms, the “other side”). Although fascinating, analyzing the discourse between founders and other interpreters was not the goal of this study, so the researcher did not go deeply into the question of “who is right”. However, familiarization was enriched when founders’ replies brought further clarification to the cases.

2.3 Selection criteria

All post-mortems were filtered for further analysis. The selection criteria comprised:

- Internet-based commercial venture, but not necessarily incorporated.
- Post-mortem written by one of the founders.
- Can be defined as a platform, connecting two or more groups.
- Established between 2004 and 2010 (i.e., Web 2.0, after the dotcom period)
- No more than 60 months old (i.e., early-stage startup).

The “Internet-based” criterion stems from the research purpose, which is to study online business, not offline-with-online-extension, or hybrids (i.e., “click-and-mortars”). A general definition of a platform was applied to identify appropriate startups; the process resulted in the emergence of four online platform types.

Additionally, the depth and length of stories were considered, so that the accepted stories had at least approximately 1,000 words to ensure some “thickness” (Nielsen & Rao 1987). On average, a post-mortem story comprised 3,037 words. Post-mortems were preferred to be as candid and unbiased as possible, although this is a subjective measure; potential biases will be considered later. The stories were not anonymously written as they included authors’ names. To maintain somewhat consistent interpretations, only stories written by founders were included; for example, there were some that recounted interviews with founders, but these were judged less authentic than had the founders actually written the stories. Tracking the authors in social media services ensured authenticity of the stories. Most founders were found via LinkedIn⁶, and they provided more information on their cases.

According to the previously mentioned principles, non-Internet businesses, seemingly short and superficial stories, those not personally written by founders, and those written in an editorial style or by a journalist were filtered out. Filtering was conducted to limit the scope of study to self-reflection that was inherently honest, authentic, and of some depth. However, for selection, incorporation (i.e., being a

⁶ www.linkedin.com

registered company) was not required as it was perceived that this would rule out very early-stage startups on which the study focuses.

2.4 Description of the startups

Overall, after 12 stories were excluded based on the aforementioned criteria, 29 failure stories remained for analysis. Short descriptions were written to summarize the startups' purpose in an easily understandable way. Such descriptions facilitate the examination by third parties unfamiliar with the startups; crystallization is also helpful for analytical purposes.

The descriptions were retrieved from two startup databases, CrunchBase⁷ and ChubbyBrain⁸, or, when neither of the databases contained data on a startup, Google search engine was employed to find a description, preferably from the founder's website or blog. The general descriptions can be found in the following table.

⁷ www.crunchbase.com

⁸ www.chubbybrain.com

Table 1 Descriptions of analyzed startups

Description	Type	Side A	Side B
<i>Backfence</i> was a hyper-local, community-based news and information service.	Content	Local users	Local users
<i>Boompa</i> was a social encyclopedia focusing on motor vehicles.	Content	Users	Advertisers
<i>Bricabox</i> was a platform for creating a personal social content site.	Social	Users	Users
<i>ChubbyBrain</i> captured and structured information on innovation economy and startups.	Content	Users	-
<i>Contrastream</i> was a social music platform.	Content	Indie musicians	Users
<i>Devver</i> aimed to turn desktop development tools into cloud-based services.	Infra	Users	Developers
<i>Diffle</i> was a social networking site centered on simple flash games.	Social	Users	Users
<i>eCrowds</i> combined Web content management and social networking for SMEs.	Infra	Consumers	SMEs
<i>eHarmony for Hiring</i> aimed to match job-seekers with job-providers.	Exchange	Job-seekers	Job-providers
<i>EventVue</i> was a tool for building conference communities.	Social	Conf. participants	Conf. participants
<i>Imercive</i> provided an IM marketing solution to help brands' consumer engagement.	Infra	Brands	Users
<i>Kiko</i> offered a calendar to keep and share online.	Social	Users	Users
<i>Lookery</i> helped social networks distribute their data outside their Web sites.	Content	Users	Social networks
<i>Meetro</i> was a location-aware IM client and real-time social networking application.	Social	Users	Users
<i>Monitor110</i> helped institutional investors access, analyze, and monetize Web information.	Content	Investors	-
<i>NewsTilt</i> was a service for journalists to build an online brand by engaging their readers.	Social	Readers	Journalists
<i>Nouncer</i> enabled real-time distribution of micro-content to Web applications.	Infra	Users	Developers
<i>Overto</i> aggregated information from different auction platforms to deliver better results.	Content	Buyers/sellers	-
<i>Pixish</i> was a platform for user-generated graphic design work.	Exchange	Designers	Design-seekers
<i>PlayCafe</i> was an online network that streamed user-generated game shows.	Content	Users	Users
<i>[Q&A startup]</i> aimed at creating a marketplace for selling and buying answers.	Content	Askers	Answerers
<i>RiotVine</i> was a social event guide for discovering and sharing events with friends.	Social	Visitors	Event organizers
<i>SMSnoodle</i> was an SMS based entertainment channel for the Singapore region.	Content	Content providers	Users
<i>SubMate</i> enabled discovering new people and things to do before and after commuting.	Social	Commuters	Commuters
<i>Transmutable</i> was a platform for doing 3D simulations on the Web.	Content	Users	-
<i>Untitled Partners</i> enabled fractional ownership of art through cooperative purchasing.	Exchange	Art-lovers	Art-lovers
<i>Verifiable</i> was a platform for data visualization.	Content	Users	Users
<i>Wesabe</i> was a finance service for tracking personal spending patterns.	Exchange	Consumers	N/A
<i>Xmarks</i> offers a social bookmarking and synchronization service.	Content	Users	Users

The frequency of platform types is as follows (N=29):

- 13 content platforms (focused on content interaction)
- 8 social platforms (focused on social interaction)
- 4 exchange platforms (focused on buying and selling)
- 4 infrastructure platforms (focused on enabling other platforms).

Most platforms studied are two-sided, but there are also one-sided platforms, in which the users are not logically dividable into two or more mutually complementing groups. The average lifetime of a startup was 26 months.

The oldest startup was 57 months at the time of failure, the youngest 8 months⁹. The sample comprised both B2C and B2B startups, with the majority being consumer-oriented startups. The mode of team size was 2.5 members, with the largest team having 30 members and the smallest one member. Most teams were male-dominant, and only two reported women in their team. Approximately half of the founders (57%) were first-time founders, the rest had earlier startup experience. All teams had technology experience, but only 38% reported prior marketing experience. The vast majority was US-based startups; there was one startup from Poland and one from Singapore. Almost all startups (86%) also applied either user-generation (UG) or aggregation as their content creation model¹⁰, which makes UG highly characteristic of this sample. Other characteristics include offering free access/use of the platform, indirect monetization, and the freemium business model.

3. Introduction to dilemmas

3.1 What is meant by dilemmas?

A ‘dilemma’ is a situation of conflict, in which a decision maker faces two or more mutually exclusive choices that all lead to a seemingly undesirable outcome. In the Oxford Dictionary (2013), dilemma is defined as “*a situation in which a difficult choice has to be made between two or more alternatives, especially ones that are equally undesirable.*” Although, in everyday life, individuals often face contradictory decision-making situations, researchers in academia tend to model decisions through preferences and weights; thus, outcomes that are perceived more costly are avoided while those with higher expected gains will be sought (e.g., Layard, Layard, & Glaister 1994).

⁹ Calculated from date founded to the date post-mortem was published.

¹⁰ A content model explains how the startup provides content for its users.

In psychology, one speaks of *cognitive dissonance*, a state of contradictory emotions relating to situations, persons, or outcomes (Festinger 1962).

In economics, scholars examine various *tradeoff situations* (e.g., Ball et al. 1988; Cohen & Klepper 1992). In particular, economists apply game theory to examine actors' strategic choices under a set of assumptions; for example, the prisoner's dilemma (see Axelrod 2006) is a famous game-theoretic problem that is structurally close to the cold start dilemma, presented in this paper, in that participants are driven to a dissatisfactory solution.

In the strategic management literature, strategic or *wicked problems* (Mason & Mitroff 1981) are characterized by associations with other problems, recursive feedback, environmental uncertainty, ambiguity in definition, conflicting tradeoff in their solutions, and societal constraints upon theoretically effective solutions (Lyles & Howard 1988). Proper definition of a problem and assessment of the strategic situation are regarded as important for finding a solution (Klein 2012), although individuals are perceived to be constrained by their cognitive capabilities and *bounded rationality* (Simon 1956).

In this study, the concept of dilemma will be applied to examine various challenges to platform startups. More precisely, four startup dilemmas are conceptualized in this study that derive from the material through the inductive grounded theory approach, and formed through discussions with founders (i.e., contextualization), and the support from the theoretical framework. Therefore, the origin of these dilemmas is inductive while their conceptualization and treatment follow a deductive process, based on the aforementioned contextualization and support from the literature.

3.2 Dilemmas in the platform literature

Several dilemmas have been identified in the platform literature. The most important of them (Rochet & Tirole 2003), the chicken-and-egg problem, is part of this dissertation, separated into cold start and lonely user dilemmas. This section will provide a literature overview on other strategic problems in the platform literature.

In general, Eisenmann et al. (2006) mention three challenges faced by a platform owner: 1) the pricing problem, or setting prices so that overall profit is optimized and takes two-sided dynamics into account; 2) the winner-takes-all problem, which is topical for platforms not dominating due to a tendency of markets to tip, which is the tendency of one system to dominate its rivals in popularity after gaining an initial edge (Katz and Shapiro 1994); and 3) the envelopment problem, involving rival platforms integrating the platform as part of their offering and thus capturing users. These issues are discussed in the following chapters with regard to dilemmas that emerged from the material. Envelopment can be perceived as a solution for startups to fight dominant

platforms with regard to the cold start dilemma, whereas the price-setting problem relates to the monetization dilemma.

Cennamo and Santalo (2013) discuss two particular problems: *coring versus tipping* and *positioning dilemma*. Coring implies exclusive contribution (e.g., apps exclusivity) by complementors to a specific platform¹¹. If the complementor gives exclusive rights to the platform owner, he/she loses the opportunity to multihome; therefore, there is conflict of interest between the platform owner who prefers exclusive complements and the complementors who prefer multihoming to maximize profits. The more there are a) exclusive complements and b) complements overall, adding to intra-platform competition, the less feasible it is for new entrants to join; thus, the coring dynamics are against tipping dynamics (Cennamo & Santalo 2013).

In a similar vein, Lee (2013) discusses *exclusivity* as a strategic problem; when possible, forcing exclusivity is beneficial to the platform owner. However, this is done at the expense of competitiveness. If gains from an exclusive platform fall short of combined gains from other smaller platforms, rational complementors will switch. Therefore, any case with several equally or near-equally strong rival platforms that requires exclusivity from third-party complementors might be ineffective. Modern app marketplaces, for example, tend not to require exclusivity (Hyrnsalmi et al. 2012).

Multihoming is also typical for video game platforms, in which game makers publish their titles on many platforms simultaneously (Idu, van de Zande, & Jansen 2011). However, there are exclusive first-party titles that do not prevent third-party publishers from multihoming (Clements & Ohashi 2005). However, as the platform engages in direct competition with its complementors by offering first-party supply, there is a conflict of interests. If first-party titles comprise the majority of sales within a platform, third party vendors have less incentive to join than if there were no exclusive first party titles. This, as argued, forms a dilemma of first-party exclusivity versus non-exclusivity (Lee 2013).

Another strategic problem relating to complementors is how *collaborative versus competitive* the platform owner should be (Economides & Katsamakos 2006). By definition, a platform can be either neutral or competitive (Hsiao 2003). If the platform owner competes with application providers, future providers have less incentive to join as, when given a choice, they are likely to avoid predatory platform owners. However, assimilation through acquisition might be regarded as preferable from an economic perspective, as proved by several purchases by dominant online platforms (e.g., Facebook acquiring Instagram; Google acquiring Jaiku).

Huang et al. (2009, 3) refer to the aforementioned problem as “*the fine line that platform sponsors must walk between maximizing profits and leaving sufficient*

¹¹ Gawer and Cusumano (2008) define the terms as follows: “‘Coring’ is using a set of techniques to create a platform by making a technology ‘core’ to a particular technological system and market. ‘Tipping’ is the set of activities that helps a company ‘tip’ a market toward its platform rather than some other potential one.” Cennamo and Santalo (2013) employ these terms in an applied sense.

residual profit opportunities to encourage complementary innovation.” They mention that absorbing complements can increase a platform owner’s profit in the short term while discouraging other complementors from making platform-specific investments. The strategic problem of the complementor is avoiding to be absorbed or made obsolete by integration into the core platform (Huang et al. 2009).

A related problem discussed by Hagiu and Wright (2011) is *disintermediation*; when the platform has performed its duty and matched two member groups (e.g., buyers and sellers), the two can, in some cases, continue their interaction without utilizing the platform, thereby eliminating the possibility of lifetime revenue. Thus, the following strategic dilemma can be formulated: if the platform owner enables transparency and uncontrolled communication among its members, it receives more interaction because it is easier for members to interact; this is beneficial for growth but leads to loss of lifetime gains. However, if the platform enforces non-transparency and strict control on communication between members, it can retain interaction within the platform at the cost of interaction levels (Hagiu & Wright 2011).

Relating to quality, Wu and Lin (2012) discuss the problem of *governing diversity*. There are multiple problems associated with diversity, which is desired by the demand side but problematic for the supply side. One problem is that the more competition focuses on a particular niche, the less overall benefit the platform owner receives. Competition is likely to drive down prices and platform owner’s profits, insofar as they depend on the pricing of its complements (e.g., through revenue sharing), while intensive focus on particular categories of complements foregoes long tail effects; that is, larger sales volume based on diverse tastes and needs of end users.

The second problem is the issue of quality. The platform’s reputation is affected by its complements’ spillover effects, so that reputable and popular complements elevate a platform’s image, whereas low-quality complements reduce its appeal to end users. These problems are not dilemmas, as they lack contradiction. However, they require proper strategic response in controlling quality without repelling complementors, and encouraging variety in terms of niches and categories to fulfill different end-user needs and thus reap long tail benefits. Wu and Lin (2012) propose discriminatory support based on quality to enhance heterogeneity that, in their model, leads to higher overall profits for the platform owner.

The *positioning dilemma* assumes two rival platforms, *a generalist* and *a specialist*, focusing on mass markets and niches respectively (Cennamo & Santalo 2013). To differentiate from the competition and create a distinct positioning in the minds of users, the platform must decide between the two approaches. If it chooses the generalist, it will lose distinction, and a potential niche market. However, if it chooses the specialist approach, it risks losing users who are interested in both generalist and specialist content. Because of winner-takes-all dynamics, users are inclined to adopt the generalist platform, with widest selection of content (Cennamo & Santalo 2013).

Reisinger (2004) mentions a strategic problem relating to *subsidization*, a common strategy in two-sided markets. The competitive dynamics can lead to a prisoner's dilemma situation in which competing platforms set negative prices, thus eroding their profits (Reisinger 2004). However, it is unclear whether this is simply a manifestation of competition in general, in that competition tends to lower prices and profits, or a unique problem for platforms. Nevertheless, its effect can be seen in the analyzed startups that typically applied an indirect monetization model without, however, a working plan to extract sufficient revenue from either side.

Relating to indirect monetization, and particularly to the *audience maker model* (Evans 2003), a special strategic dilemma takes place when the demand side perceives advertising negatively but is employed as a monetization model. Logically, the more advertising the end users see, the more revenue the platform owner earns, although at the cost of end users' dissatisfaction (Anderson & Gabszewicz 2006). Therefore, the dilemma involves setting the level of advertising so that it fulfills both economic goals and, if not serving, at least not repelling users from the platform.

Church and Gandal (2004) identify four types of demand-side issues relating to platforms: 1) *coordination problems*, 2) *tipping/standardization*, 3) *multiple equilibria*, and 4) *lock-in*. They explain coordination problems from the customer's perspective, so that a customer choosing the wrong platform or standard risks "being stranded" as the expected network effects do not actualize (Church & Gandal 2004). There is a coordination problem because the customers cannot communicate their willingness to join *ex ante*, and therefore each is hesitant to join. As can be seen, this is indeed the chicken-and-egg problem (e.g., Evans 2009a). Customers cannot redeploy their platform-specific investment towards adoption of another platform. It is unlikely, however, that the platform owner would be able to exercise power because users simply have no incentive to stay, despite any sunk cost. Thus, the *hold-up problem* is unlikely to arise (cf. Klein 1998). The choice of the platform is a demand-side strategic problem; it helps understand why users are cautious when adopting platforms. In tipping, after a particular threshold, one platform becomes dominant and all users convert to being its customers (Shapiro & Varian 1998).

Tipping becomes a problem if inferior technology is chosen, in which case the opportunity cost is the loss of superior technology in achieving platform users' goals (Church & Gandal 2004). The Qwerty keyboard layout is an often employed example that, according to some, is not the optimal layout in terms of writing speed but is practically impossible to replace due to its wide adoption; that is, network effects (Parker & Van Alstyne 2010). Once a standard has been widely diffused, it is hard to abolish; however, before that, its dissemination is difficult due to the chicken-and-egg problem. In the literature, this is referred to as the standardization problem (Besen & Farrell 1994; Weitzel, Beimborn, & König 2006). *Multiple equilibria* is the opposite of tipping, so that customers are unable to commit to any competing platforms due to

fear of choosing the wrong one (Church & Gandal 2004). In this case, all competing platforms lose as adoption is delayed to the last possible moment.

Finally, lock-in can become an issue for users adopting the winning design (Church & Gandal 2004). Multiple types of power play can arise; for example, the aforementioned hold-up problem whereby the platform owner can raise prices as long as the switching cost remains higher or there are no *de facto* replacements, or the quality of the platform's operations or technology might suffer due to lack of competition. These effects are similar to monopoly, and are naturally associated with locked-in customers (Farrell & Klemperer 2007).

As can be seen, the platform literature has discussed a variety of strategic problems relating to strategic choices of platform owners, complementors, or demand-side users. The dilemmas presented here were identified through a literature inquiry and represent the current state of research. However, any number of new dilemmas can be created based on alternative situations. This study focuses on four specific strategic dilemmas that are presented in the following chapter. The four dilemmas emerged from the GT analysis, and are chosen because they represent the issues identified by the studied platform startups' founders. Moreover, they seem to respond to the platform literature, in which the chicken-and-egg problem typical for startups is central.

4. Dilemmas emerging from analysis

4.1 Results from the black box analysis

The following figure reveals a model of the "black box" of failure based on the GT analysis. After deciding to focus on dilemmas (i.e., emergence of the core category), selective coding was conducted to find support for dilemmas, with new dilemmas also being found.

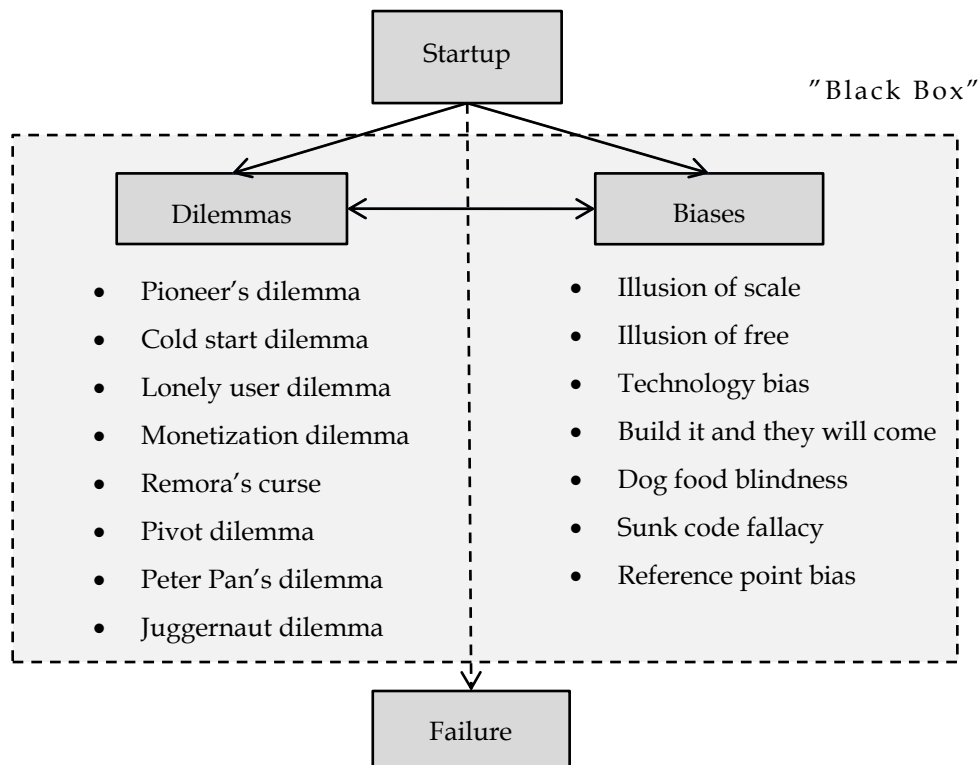


Figure 1 Exploratory outcomes – opening the black box of failure

The purpose of Figure 1 is to show the larger framework in which the chosen dilemmas are rooted. Briefly, the dilemmas are defined as follows:

- **Pioneer's dilemma:** if the startup launches too early, it will pay the pioneer's cost and is likely to fail due to insufficient resources; if it launches too late, it is unable to capture users from incumbents.
- **Cold start dilemma:** without content, users are unwilling to join and generate content.
- **Lonely user dilemma:** without other users available at a given time, users are unable to use the platform.
- **Monetization dilemma:** if access and usage of a platform is provided for a fee, users are unwilling to join; if access and usage is free, the platform is economically non-viable.
- **Remora's curse:** if users or content is sourced from a host platform, the cold start problem can be solved; however, at the loss of power relating to customer relationships, monetization, and so on.

- **Pivot dilemma:** if the startup accommodates its user's wishes in product development, it loses focus; if it does not, it loses the user.
- **Peter Pan's dilemma:** if the startup accepts external funding, it loses decisive authority and becomes vulnerable to hasty decisions; if it does not, it loses against competitors with funding.
- **Juggernaut dilemma:** due to lack of legitimacy, the startup is unable to convert enterprise clients which would grant it legitimacy.

Following earlier research outlining failure as a combination of reasons (Lussier 1996), it can be stated that the failure of the sampled startups comprises 1) general business problems (e.g., management issues; lack of marketing), 2) startup-related problems, arising from the fact of being a startup (e.g., "liability of newness"), and 3) platform-specific problems.

"Illusions", which were mentioned by some founders, are perceived as fallacies and observed also potentially to exist in other cases. It was also found that founders typically associated biases (i.e., their own thinking errors) as reasons for why they could not properly address the dilemmas, or even identify them in time. They are perceived to relate to dilemmas because they affect the assumptions of strategic decision-making. For example, assuming that all users prefer freeness over quality will more likely lead to a monetization dilemma than a contrary premise.

The identified fallacies are defined as follows:

- **Illusion of scale:** the tendency of startup founders to assume online businesses require less effort to succeed than offline businesses.
- **Illusion of free:** the non-validated assumption that users are unwilling to pay for online products.
- **Technology bias:** the tendency of startup founders to assume that all startup problems can be solved by technological means.
- **Build it and they will come:** the tendency of startup founders to assume that the product will market itself.
- **Dog food blindness:** the refusal of accepting fault in one's product.
- **Sunk code fallacy:** the tendency of startup founders to refuse to make drastic business changes (i.e., pivots) due to the time and effort spent making the current version of the product.
- **Reference point bias:** the tendency of startup founders to assume that successful implementation of a particular strategy or tactic in another context would automatically work in their context (e.g., "because it works for x, it will work for us").

Due to limitations on the scope of this study, fallacies were left for further research. It was considered that including them would 1) take away the focus of dilemmas, and 2) expand the required theoretical basis to become too extensive for one study. In other words, to maintain depth of the analysis, it was not perceived possible to thoroughly discuss dilemmas and biases, and so the latter are only briefly discussed as preliminary observations.

Further clarification in the next section will explain why a subset of problems was chosen for detailed treatment. Consistent with GT principles (Glaser 2004), all dilemmas and illusions were captured by the author. Particular names, including “remora”, “cold start”, “dog food”, “build it and they will come”, and “sunk code” were taken from founders’ post-mortems and industry terminology.

4.2 Narrowing the focus of the study

As can be seen, the GT analysis identified many phenomena that remain outside this report. All research can be regarded as a tradeoff leading to the necessity of restraining the research focus (Eisenhardt & Graebner 2007), and focusing on dilemmas was simply the author’s choice. The author preferred a deeper focus on dilemmas, albeit this decision omitting the treatment of biases that, according to the analysis, are equally important when considering the failure outcome.

The analysis showed that platform *startups* struggle with many other problems relating to their startup nature (e.g., Wasserman 2013). However, given its positioning, this study focuses on platform-specific problems. Most other startup problems are well documented in the literature. For example, liability of newness (Bruderl & Schussler 1990; Freeman, Carroll, & Hannan 1983; Singh, Tucker, & House 1986; Stinchcombe 1965) is associated with the problem of legitimacy (i.e., “Juggernaut dilemma”). The entrepreneurship literature has analyzed problems of adaptation and related *turnaround strategies* (e.g., Boyle & Desai 1991; Hofer 1980; Melin 1985).

In a similar vein, the strategic management literature has identified glitches between venture capitalists and founders. Also, growth pains such as the *cash flow problem*¹² (Mears 1966; Wilcox 1971) are associated with Peter Pan’s dilemma. Katila, Rosenberger, and Eisenhardt (1998) studied the “shark’s dilemma”; that is, how a startup can collaborate with a larger organization while retaining its competitive advantage. Pioneer’s advantages and disadvantages, and also those of early movers, have been extensively covered in the literature (e.g., Agarwal & Gort 2001; Golder &

¹² The cost of customer acquisition needs to be covered instantly, while customer lifetime revenue is received in the future. Therefore, the faster the company grows, the more it accumulates loss.

Tellis 1993; Kerin, Varadarajan, & Peterson 1992; Lieberman & Montgomery 1988; Robinson, Fornell, & Sullivan 1992).

The following table classifies the strategic dilemmas based on their applicability.

Table 2 Applicability of dilemmas

Dilemma	Specific to platform startups	Specific to startups	Specific to online business	Applies to any business
Cold start	x			
Lonely user	x			
Monetization	x		x	
Remora's	x			
Pivot				x
Peter Pan's		x		
Pioneer's		x		
Juggernaut		x		

The cold start dilemma can be regarded as a specific problem for platforms, regardless of whether they are online or offline. The lonely user dilemma relates not only to activating users, but also to time¹³; thus, it is a problem of real-time social services. Monetization is a general problem of online offerings, and also applies to platforms, although not necessarily to all startups beyond Internet markets. Remora's curse applies when the platform startup employs the remora strategy to obtain users or content from another platform. The pivot dilemma¹⁴ applies to all businesses, but is not a specific problem of platform startups. Peter Pan's dilemma is a problem for startups that need to decide whether to remain small and be consumed by competition, or grow big and be consumed by expenses. The pioneer's dilemma relates to launching an unfinished product and failing to gain adoption, or waiting for it to be perfected and losing competitive advantage. Similarly, the juggernaut dilemma is proprietary to startups: they cannot get customers due to a lack of legitimacy, and due to lack of customers, they cannot get legitimacy (cf. Stinchcombe 1965).

Detailed treatises on all dilemmas, although enticing, would have severely fragmented the study as they clearly connect with multiple streams of the literature. In other words, breadth was sacrificed for depth. This decision was reinforced by the fact that it proved difficult to find a common denominator that would have enabled building a unified theoretical framework, as now has been achieved by relying on the platform literature. Finally, due to the relative recency of the platform/two-sided markets literature, it was concluded that there is more room for contribution than other identified streams, especially on the strategic management of platforms.

¹³ Finding available matches at any given time complicates coordination, and thus aggravates the chicken-and-egg problem.

¹⁴ If a startup heeds customer feedback when developing a product, it loses its *raison d'être*, or its original vision; if it ignores customer feedback, it loses the customers.

4.3 Chosen dilemmas and their treatment

Following the aforementioned rationale, the focus of this study is on strategic problems proprietary to platform startups on the Internet, particularly on the following dilemmas:

- Cold start dilemma
- Lonely user dilemma
- Monetization dilemma
- Remora's curse.

These dilemmas will be discussed in detail in the following sections, while other dilemmas are omitted. The presentation of dilemmas follows the structure of: 1) definition and exhibits, 2) the literature positioning of the dilemma, and 3) solutions derived from theory. *Solution* is intuitively defined as a solution to a problem that, in this case, satisfactorily solves one or both parts of the dilemma.

It is argued that by solving the cold start dilemma through subsidization (e.g., offering free access and usage), the startup will face the monetization dilemma, whereby it is unable to capture economic value from the interaction taking place in the platform. Whereas, when solving the lonely user dilemma by applying the remora model (i.e., 'envelopment' in the platform literature), the startup faces what is termed 'remora's curse' (i.e., dependence of the host platform). The latter condition bears similarity to the classic hold-up problem (Klein, 1998). Cold start and lonely user dilemmas are understood as different realizations of the chicken-and-egg problem presented in the dissertation's introductory chapter.

The following figure illustrates the idea.

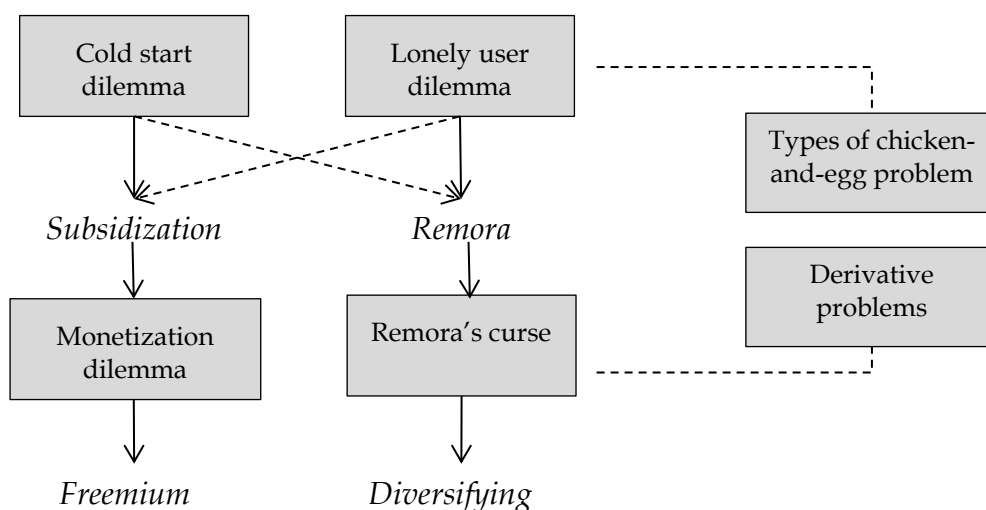


Figure 2 Strategic actions and their consequences

Therefore, the following strategic choices apply:

1. When facing the cold start dilemma, the startup solves it by *subsidization* or *remora*.
2. When facing the lonely user dilemma, the startup solves it with the *remora model* or *subsidization*.
3. When facing the monetization dilemma, the startup solves it with the *freemium model*.
4. When facing remora's curse, the startup solves it by *diversifying*.

The selection of solutions arises from the literature and analysis of the empirical material. Subsidization is commonly considered a solution to the cold start problem in the platform literature (e.g., Rochet & Tirole 2005), while the remora model is conceptually similar to the envelopment strategy presented by Eisenmann et al. (2011). Freemium, however, is a special form of subsidization that is commonly applied by Web startups (Wilson 2006; Niculescu & Wu 2013). Notice that subsidization and the remora model can both be applied in relation to the cold start and lonely user dilemmas. In the following subchapters, this particular order has been chosen for the purpose of presentation, that is, not to repeat their treatment.

Diversifying is synonymous to multihoming, which is a central concept in platform theory (Armstrong 2006). Also, because there is generally a high degree of interoperability between Web platforms, for example, through application programming interfaces, or APIs (see Rochet & Tirole 2003), both envelopment and multihoming are common in online markets (Mital & Sarkar 2011). Therefore, the considered solutions depict both platform theory and practice. However, they have not been integrated into one framework in the extant literature.

4.3.2 Cold start dilemma

The cold start dilemma is a specific problem for content platform startups relying on UGC. The dilemma can be defined as follows: when there is a lack of existing content, no users are motivated to create new content, and so there remains a lack of content. As a result, the desired UGC model fails, the platform will fail, and the startup will fail. These assumptions will be examined next. First, it is assumed that existing content has a relationship with new content; that is, the reason why other content is created.

Second, the cold start dilemma might differ through the assumption of multi-sidedness, depending on whether or not user homogeneity is assumed: 1) in a one-sided content platform, users provide content that is beneficial for the same type of users, and 2) in a two-sided content platform, users provide content that is beneficial

for other types of user. The interaction between user groups defines the type of the platform, which is logically derived from the fact that users' interests vary: for example, buyers seek sellers, not other buyers in an auction platform; males (typically) seek females in a dating site; however, people interested in mobile phones are looking for other people of a similar type in a mobile phone discussion forum. This is relevant due to motivational factors; namely, creating a community, which will be revisited when discussing solutions. If the interests of the users are common, the platform can be defined as a community, and therefore tactics to acquire users from this particular niche should vary *vis-à-vis* a mass audience.

The question of motives and incentives is paramount for getting the desired response (see Table 3 [2]). In platforms relying on UGC, the goal is that the content and actions of first-arrived users lead to the recruitment of second-generation users either directly (e.g., invitations) or indirectly (e.g., content indexed by search engines), as opposed to the startup acquiring new users, which requires marketing investments and skills. Building such assets can be prevented by the *build it and they will come* fallacy, defined as a tendency of technology-oriented founders to avoid marketing.

There are two types of participation behavior: contribution and consumption¹⁵. Contribution is feasible if expected benefits are larger than the cost of contribution. Consumption has a lower cost but also a low switching cost due to a generally high number of alternative sources of content (i.e., substitutes) on the Internet. Further, the benefit of consumption arises from the informative or entertainment properties of the content; the supply side benefit comes from search engine externalities, which is compatible with online search behavior (Hsieh-Yee 2001), and also the social spillover effect, such as sharing or commenting on the content. The difference in participating behavior enables analysis of the setting as a two-sided platform, whereas including single-user motivation would result in a one-sided platform.

The analyzed startups report the cold start problem as follows.

¹⁵ Note the similarity to types of monetization behavior: joining without paying (i.e., free users) and paying for joining (i.e., customers).

Table 3 Exhibits of cold start dilemma

Example
[1] <i>“(We) underestimated the “cold start” problem [...] especially when it relies on user-generated content. The value you provide to your users centers around the content on the site, so to build a user-base you need a lot of content created by the first users to kick-off the community.”</i> (Dickens 2010).
[2] <i>“We fell into the “build it and they will” come school of thought (although even when they came, we still weren’t in good shape). Users didn’t review because there was no enlightened self-interest for them to do so. Nobody wanted to edit our data for the same reason.”</i> (The Chubby Team 2010).
[5] <i>“[A] place where people can find and provide information about private companies/startups, and also review them. Awesome idea, right?! WRONG! Where the heck are we going to get all this data about startups?”</i> (The Chubby Team 2010).
[6] <i>“[H]aving to consistently find new content was probably the biggest hit to my motivation for the site. As much as I loved indie music it was draining to constantly find new albums to post up.”</i> (McGrady 2008).
[7] <i>“[The startup] was a product designed to connect journalists with readers. As such, we had two sets of customers, which means we need to do customer development twice. I spent a great deal of time designing the ultimate solution for journalists, and almost no time on what readers wanted. As such, I didn’t really know what to make, or what to say to the journalists about what they should write.”</i> (Biggar 2010).
[8] <i>“Our proposition was made even more complicated because we were trying to create a market-place. When a magazine opens for submissions, you’re submitting to that magazine. But [the startup] was one step removed – anyone could make an assignment. So even if you trusted [us], you didn’t necessarily trust the person who posted the assignment.”</i> (Powazek 2008).
[9] <i>A close friend reading my early business presentation told me he liked it a lot but was worried about one line. He said it sounded like I’m building infrastructure and that is going to create problems with most investors. At the time I was focused on building a website and the comment didn’t register. Now, with more perspective, I can certainly appreciate the advice.</i> (Hammer 2008).
[10] <i>In community-generated media, trust is everything. When you ask for submissions, contributors go through an instant internal calculation: “Do I trust these people with my work?” When your site is brand new, you’ve got no record to rely on. And with more shady “user-generated content” schemes popping up every day, people have their defenses up.</i> (Powazek 2008).

As noted, and demonstrated by exhibits, a cold start is a specific problem for Internet startups trying to leverage UGC [1]. Examples include discussion forums, blogs, and various crowdsourcing services, in which the startup offers a platform for discussion or other forms of social interaction; for example, dissemination of information, pictures, videos, or ratings [5]¹⁶. Such startups depend on relevant and updated content (e.g., articles, comments, pictures, reviews, and ratings) to acquire visitors, convert them into repeat users, and encourage them to produce more content¹⁷.

¹⁶ For example, YouTube is a content platform, so is Flickr. Whether they are one-sided or two-sided platforms is arbitrary.

¹⁷ In contrast, in-house content-generation does not require users to actively produce content; albeit, startups following this model might enable UGC, hoping for UG benefits.

Consequently, if there is little or no UGC in the platform, new participants have no or only small incentive to join; if no participants join, no new content is created, and so forth. As no visitors and new content are created, there is no reason for the platform to exist and the startup will fail. In other words, the cold start dilemma is a variation of the well-known chicken-and-egg problem, and quite a typical reason for platform startups to fail.

The cold start dilemma can be demonstrated with a simple game. The following game considers a one-sided platform in which users are all the same type, and gain benefit from each other's participation.

Table 4 Too many consumers (of content)

		C_2	
		<i>Contribute</i>	<i>Not</i>
C_1	<i>Contribute</i>	0, 0	-1, 1
	<i>Not</i>	1, -1	0, 0

In the game, contributing can be unpleasant for consumers of content; thus, they incur a cost (i.e., -1). This cost is a function of time, effort, and uncertainty concerning the usefulness of contributing (see Table 3, [10]). Moreover, if a consumer contributes content, another consumer will not return the favor but simply consumes the content, thus gaining a payoff of +1. If both parties contribute, the effort and benefit cancel each other out. Both receive a payoff of zero. However, this is not stable equilibrium as each party has an incentive to improve their position by not contributing (i.e., moving from 0 to +1). Because not contributing yields the same benefit as contributing if the other side makes the same choice, players might be indifferent to contribution. The safest strategy, which minimizes potential cost, known as *minimax* (see Camerer 2003), is not to contribute, as contributing risks a negative payoff.

Therefore, users will not contribute when they expect others not to return the favor. However, more importantly, they might not contribute *especially* when they expect others to contribute.

Now consider changing the game into a two-sided platform, where there are two different groups of users, both of which derive additional benefit from complementing interactions.

Table 5 Consumers and generators

		G	
		<i>Contribute</i>	<i>Consume</i>
C	<i>Contribute</i>	2, -1	0, -1
	<i>Consume</i>	3, 1	0, 0

Generators enjoy contributing (i.e., creating content), although it is more valuable to them when there are consumers of content. In contrast, they are indifferent to consuming content. Consumers of content do not prefer contributing, so it is costly to them: however, they derive benefit from the content produced by generators. This is clearly demonstrated in Table 3 [7], where the startup focused on one side while neglecting the other; as a consequence, it was unable to provide value for either.

Generators receive intrinsic benefit from contributing and are indifferent to other players' contributions, but not consumption. In fact, consuming content is a type of invited free-riding: the creator of the content wishes it to be consumed, and is indifferent to whether others create content or not; although, they might appreciate "side payments" such as praise and criticism. Further, in contrast to the previous example, the payoff for the consumer no longer relates to his/her own choice of contributing and, given he/she has information on the generators' payoffs, the consumer will always prefer not to contribute. A stable equilibrium¹⁸ is when generators contribute and consumers do not.

Furthermore, this explains why merely joining a platform is insufficient in the absence of active usage. The users who join will quickly churn if the platform is "cold". This observation is critical in terms of determining which action to follow: joining or participating¹⁹. Therefore, it becomes important for the startup to find contributors and offer them a convenient platform. Contributors and consumers can have complementary needs, which is why both parties are needed. Moreover, the startup needs both to consider the critical mass of any users and also the correct proportion of participants. This is because, in a two-sided setting, the types are interdependent, and rather than preferring the existence of a similar kind of participant, users prefer a different kind to join.

A two-sided platform, in particular, functions on reciprocal utility: the utility of group *A* for group *B* is in proportion to the utility of group *B* to group *A*. The chicken-and-egg dilemma is therefore associated with the quality, amount, and type of activity of respective groups to their counterparts. Advertising is a special variation as there is

¹⁸ Neither party would gain a better payoff by switching.

¹⁹ As noted by one of the founders (Roseman 2010): "good Google foo [website traffic] won't save you. You need that traffic to translate into a community. A visit is not an interesting statistic, especially in a business that requires the community to produce content."

no content without advertisers²⁰; without content, no visitors; and without visitors, no benefit for advertisers. Therefore, although often considered negative network effects *vis-à-vis* end users, advertisers can, in fact, generate indirect utility by funding content creation. However, this does not apply under UG; thus, advertisers are not considered in the dilemma.

Finally, although the startup can mediate interaction between two parties, there needs to be a degree of mutual trust for the interaction to take place, as exemplified in Table 3 [8]. This trust might not automatically transfer from the platform to all of its users.

4.3.2 Lonely user dilemma

Generally, for users to join a social platform, they expect to find other individuals using it. If none can be found, there is little or no incentive to join the platform. The logic is equivalent to the cold start dilemma. In contrast, once the first users have signed up, new users are enticed to join through the connections of the first group, and so on; startup founders refer to the *viral effect* or simply exponential growth. The logic is based on the notion that the total benefit generated by a social platform can be measured through the number of connections between users (cf. Metcalfe’s law; see Briscoe, Odlyzko, & Tilly 2006), and the frequency and quality of activity within these connections (i.e., the network effects).

The principle of users’ mutual expectations can be demonstrated with a simple game.

Table 6 Startup platform

		S_2	
		<i>Join</i>	<i>Not</i>
S_1	<i>Join</i>	S^2, S^2	-1, 0
	<i>Not</i>	0, -1	0, 0

S^2 is the potential number of interactions between members of the platform, and marks the network effect. Albeit being a bad proxy for network value, it is easy to quantify and represents an upper limit for interactions (Aggarwal & Yu 2012). In other words, parties potentially draw symmetric benefit from each other’s presence, and payoffs are equal.

²⁰ As the firm is unable to provide content without indirect monetization; note there is an inverse proportion to advertising, so that users typically respond negatively to its increment.

Joining has a cost, if not financial then time and effort, which is why expected non-participation of another party leads to both not joining. Both parties would be advantaged by joining but as it is risky for each of them to do so, the outcome might be both not joining. This is referred to as the coordination problem in game theory (Van Huyck, Battalio, & Beil 1990), and describes well the lack of legitimacy to which the new platform is subject.

In contrast, consider an incumbent platform. This example demonstrates the importance of a critical mass.

Table 7 Incumbent platform (with a critical mass)

		S_2	
		<i>Join</i>	<i>Not</i>
S_1	<i>Join</i>	S^2, S^2	$S^2-1, -1$
	<i>Not</i>	$-1, S^2-1$	$-1, -1$

In this case, the incumbent platform already provides a critical mass of users (or content) for interaction, which is why the dominant strategy for each party is to join. Even when other users do not join, the entrant receives benefit from the existing base of users (S^2-1). Because both parties have the incentive to join, it is also the Pareto-dominant equilibrium. Therefore, it is much more difficult for a new platform to attract entrants than for an existing platform with a critical mass. Consequently, even in the presence of multihoming and low switching cost, the startup can fail to rally users.

However, the basic chicken-and-egg problem becomes more complicated when introducing dynamic factors, such as time and place. Consistent with the definition of the cold start dilemma, the lonely user dilemma can be defined as follows:

In a social platform, when there are no existing users, no new user will have a motivation to join. Additionally, when there are no active users at a given time or place, no other users will use it at that time or place.

If a user has no contacts in a social service, the perceived benefit of the service equals zero for that particular user at that particular time or place, regardless of the number of registered users or “static” critical mass, such as content, that is always available. In practice, these platforms can include social platforms such as chat services requiring simultaneous presence of parties, and location-based services whereby the interacting parties need to be available at the same time and also in the same place.

In the cold start dilemma, the focus is on recruiting new users (e.g., to generate content) and keeping them active in UG activities. In the lonely user dilemma, the

focus is on acquiring users for social interactions taking place between individuals and groups, and keeping this interaction active (i.e., *the problem of active use*) while considering the effect of time. As such, at any given time, not only on average, the platform must have a critical mass to provide matches and thus be useful²¹.

Therefore, the requirement of a critical mass is much more extensive than in the case of static content. In other words, the demand-side benefit in social platforms is derived from social interaction (i.e., social exchange) instead of more or less static content, with the source being topicality, information, entertainment, or other properties of the content. For example, unlike communication between friends, reviews and videos are not social interaction in a fundamental sense²². In a content platform, users enter the website for the sake of the content (e.g., news, reviews, articles, and videos), whereas the lonely user dilemma is typically associated with social network sites in which availability of others is conditioned by time and/or physical location. Table 8 exhibits the dilemma.

Table 8 Exhibits of the lonely user dilemma

Exhibit
[1] <i>"I think you need a critical mass in any community and we didn't quite achieve that critical mass. I mean, who wants to go into a forum when there's really nobody to talk to?"</i> (Warner 2009).
[2] <i>"Lastly, the 'real-time problem'. This one is similar to the location problem in that if someone wasn't online when you were online, they were no good to you. While the real-time chat aspect of the application made for some really serendipitous meetings, it also made it harder for people to gauge the activity of their communities, especially if they logged in at odd hours, people were set as away."</i> (Bragiel 2008).
[3] <i>"We launched our product and got all of our friends in Chicago on it. We then had the largest papers in the area do nice detailed write-ups on us. Things were going great. We had hundreds of active users and you could feel the buzz around it. [...] The problem, we would soon find out, was that having hundreds of active users in Chicago didn't mean that you would have even two active users in Milwaukee, less than a hundred miles away, not to mention any in New York or San Francisco. The software and concept simply didn't scale beyond its physical borders."</i> (Bragiel 2008).
[4] <i>"The weakness of the hub strategy was the market players never arrived at the same time. Sellers would flock but there would be no buyers, or buyers would flock and there would be no sellers."</i> (Anonymous founder).
[5] <i>"The real tests come at moments like we had about a week after our initial launch. Lots of people dropped by, told us they loved the site, and didn't come back. So, there we were, left with one big question that lead to endless others: Why aren't they coming back? Is something too confusing? Is our idea a bad one? Do we just wait and see if they come back later? 28ow e need to build another tool?"</i> (Karjaluo 2009).

²¹ Consider the Facebook platform: if in some given time frame, all of a user's friends were offline and had not updated their statuses, eventually the user would permanently stop using the service, regardless of how many registered users there are.

²² Note that this does not exclude spillover effects between content and social interaction. In fact, these are generally requisite for UG effects to occur.

We can deduce that the number of users required to initiate the self-replication UG process is often referred to as a critical mass, both in the literature (see the following chapter) and by practitioners [1].

The *coordination problem* [4] is distinguished from the real-time problem [2] based on the notion of time. Coordination fails as a result of an overall lack of participants in the other side. The real-time problem might mean that there is a potential critical mass in the other side, but that they are momentarily inactive²³. As noted previously, the real-time aspect is emphasized in the lonely user dilemma due to immediacy of social interaction. More precisely, coordination can relate to the participants' different needs, which requires understanding both sides well and managing their expectations. The timing of converting users can be critical here; thus, if the technology is premature, persuading users to join can cause a major disappointment. Basing the platform design on the premise of self-organization might not take place in reality.

Furthermore, in social environments, match is not simply a question of the number of members in group A or B, but also their quality (i.e., compatibility). Match might require a special type of user property relating to, for example, demographics or offline relations. Not all counterparties willing to interact will regularly provide a match²⁴.

The real-time problem, if defined as 'getting users on board', suggests that solving the cold start problem is insufficient to solve the lonely user dilemma; that is, registering to a platform does not automatically lead to active use, without which, the platform will gradually die regardless of adding new users. This is termed *churn* in marketing and is parallel to pouring water into a bucket with a hole. Thus, while loyalty is low, increasing customer base will only increase cost, relating to lifetime value, as customers constantly abandon the service. In other words, users of a real-time service need to be simultaneously present or coordination will fail. This is crucially different from static content, whereby coordination is much less affected by timeliness.

The *transferability problem* [3] implies that a predominant user base in context A (e.g., location) cannot automatically be generalized as a critical mass in context B (i.e., another location), even when it fits the notion of critical mass in its primary context. In particular, the problem relates to *hyper-local platforms* such as location-based services. Although our exhibit addresses location, the transferability problem itself can be generalized into any context in which one group is so distinct from another that direct network effects will not emerge across the two groups.

²³ How is the real-time problem different from the lonely user dilemma? The former is a manifestation of the latter, in which time is the match-making criterion. However, the lonely user dilemma can be manifested in relation to other match-making criteria, such as physical location and preferences. In both cases, the user is "lonely" without an adequate match.

²⁴ However, this type of differentiation also exists in exchange platforms. Consider the following criteria for match; for example, item being transacted, condition, reputability, and location of the other party. In general, however, users are more selective in engaging in social interaction with "strangers" than transacting with them.

Therefore, the startup needs to consider its match-making role²⁵ and emphasize user-acquisition based on the development of dynamics between the groups. For example, if there is a shortage of either female or male members in a dating service, more users of the required gender need to be recruited. When there is disconnection between user bases, for example, niche division or geographical distance (i.e., local social networks), there is a shortage of *synergy* between user segments; that is, no positive network effects arise even when the groups are connected. Hence, each segment needs to be built individually due to proprietary network externalities to that community, although the transferability problem [3] will not be overcome unless propagated by members of the community. The benefits for a startup involved in building multiple communities are therefore limited to learning gains, which can facilitate replication of critical success factors, and also potential reputation and brand spillover effects when users in another community become aware of the platform's existence, and perhaps start acquiring its community.

Furthermore, users' homogeneity, defined as similarity of interests, demography, or other feature that increases similarity, might influence the perceived utility of the network by an individual user. These features can include, for example, location, online status, and similar preferences. Diversification is needed if the service is match-making between opposite groups with users looking for counterparts (i.e., buyers for sellers; men for women); thus, homogeneity tends to be counterproductive in two-sided markets²⁶. However, in one-sided platforms, users derive benefit from similar users joining the service, which implies direct network effects. They might also appreciate complements by other firms, such as plugins, games, or additional content by third parties within a platform ecosystem, which reflect indirect network effects.

Conversely, when there are users in one side (A) competing for members on the other side (B), each additional user in A in fact reduces the incentive for similar users to join. Strictly speaking, assuming that match-making exhibits rivalry in that connections between members in A and B exclude other connections, this increases competition²⁷. Therefore, a high number of members in A represents negative (i.e., direct) network effects for a prospective member of A as they are competing for the same resources (i.e., members of B). The final decision to join is affected by the difference between perceived negative network effects (i.e., the level of competition) in comparison to perceived positive network effects (i.e., the number/attractiveness of

²⁵ Essentially, a marketplace platform is a mediator between two parties, often supply- and demand-side, so that it offers auxiliary benefits in addition to matching (i.e., coordinating), such as payment options and vouching.

²⁶ In a sense, this is a trivial observation. The definition of two-sidedness entails the idea that the groups are distinct. Therefore, similarity merely parallels this state with some actual criteria for distinctness.

²⁷ This might or might not be the case, depending on the strategy of users. For example, in a dating site, a user might stop creating connections to potential dates after finding "the one". However, it is also possible that he/she might continue to create further connections.

group B). Implications such as these will be further discussed in the following literature subchapter.

4.3.3 Monetization dilemma

The monetization dilemma occurs when a startup needs to decide whether to offer its platform for free at the loss of business viability, or charge for the access and/or usage at the loss of users' willingness to join. In other words, willingness to join (WTJ) and willingness to pay (WTP) are in conflict.

The following table presents exhibits of the dilemma.

Table 9 Exhibits of the monetization dilemma

Exhibit
[1] <i>"This post attempts to summarize the [startup's] story: how we got to be the most heavily used browser synchronization service in the world and yet still find ourselves pulling the plug."</i> (Agulnick 2010).
[2] <i>"For four years we have offered the synchronization service for no charge, predicated on the hypothesis that a business model would emerge to support the free service. With that investment thesis thwarted, there is no way to pay expenses, primarily salary and hosting costs. Without the resources to keep the service going, we must shut it down."</i> (Agulnick 2010).
[3] <i>"The thesis of our business model [...] was that there was a need for video producers and content owners to make money from their videos, and that they could do that by charging their audience. We found both sides of that equation didn't really work. [...] Video producers are afraid of charging for content, because they don't think people will pay. And they're largely right. Consumers still don't like paying for stuff, period."</i> (Diaz 2010).
[4] <i>"[E]ven if enough people wanted the product, the business model around it is something which we haven't been able to figure out. We have the product's version 2.0 sitting ready [...] but we do not see a clear exit yet, so are hesitant to launch it. Being blogged about major tech blogs [...] we already got that love. If we stayed out in the market more – we'd probably get more 'love'. But 'love' can only keep the servers humming for so long ☺."</i> (Anonymous founder).
[5] <i>"The experience has made me ask myself almost every time I see a cool web app – 'OK, but how will it make money?', and if it can't, then it would not be more than a short-lived dream for its founders and backers."</i> (Anonymous founder).
[6] <i>"I felt like getting into the monetization stage was going to be long and difficult. And it was one of those businesses where I liked the idea, but I didn't think about monetization before I started, because it was kind of a sexy idea, for me at least. And, I got some traction. I ended up with a few thousand subscribers in a few weeks with the help of some larger companies that were helping me out at the time. And, I kind of realized that to make my first dollar was going to be a long time away [...]."</i> (Warner 2012).
[7] <i>"Despite having over 200 beta testers at launch, it proved difficult to convert them into customers. My prices started at \$10/month, and though in my eyes this was a bargain, my product didn't demonstrate enough value to enough of my market quickly enough to justify the operational costs of the business and my personal expenses."</i> (Newberry 2010).

As the monetization dilemma relates to generating revenue, it takes place independently of the size of user base ([1], [2], [4], and [5]), regardless of how substantial this is; therefore, it concerns even popular platforms, such as Twitter²⁸. Consequently, popularity among users does not automatically lead into financial success, unless successful monetization occurs. Other key tenets of this dilemma are that the willingness to pay (WTP) of users in online platforms is low [3], monetization requires time and effort [6], and even low prices may not be “low enough” to attain WTP [7].

The dilemma is based on two critical conditions, which here are termed the payment and revenue hypotheses:

- a. *Payment hypothesis*: If a startup offers a paid product, it acquires zero or very few customers; the potential risk here being *illusion of free*.
- b. *Revenue hypothesis*: If the startup offers a free product, it earns zero or very little revenue (i.e., *problem of free*).

Seemingly, the startup cannot win. The dilemma therefore addresses difficulties of both direct monetization (i.e., impossible to gain users) and indirect monetization (i.e., impossible to create business); the former being impossible under the premise that users refuse to pay when charged for access or usage of a platform, and the latter under the premise that the startup is unable to execute a successful model of indirect monetization even after gaining users, which leads to an unviable business in the long run²⁹.

Major underlying assumptions, in economic terms, include high substitutability between products (i.e., competition), low switching cost³⁰ between them, so that users can easily switch providers and therefore cannot be locked in, for example, by ‘bait and switch’, and strict homogenous price sensitivity whereby all customers always choose the lowest price, so that users move from paid to free. Further, it is assumed that differentiation has no impact on WTP. If even one of these assumptions were incorrect, one of the hypotheses would fail, and the dilemma would dissolve. Consider the assumptions: first, substitutability refers to the possibility of replacing the startup’s product with competing products, which might or might not be true, totally depending on the product. If the startup has created something that no competitor can replicate, its product cannot be easily substituted and it would then be fair to counter the first hypothesis and assume that users would be willing to pay for the product, assuming that the differentiating property is what they *want*; mere differentiation is insufficient.

²⁸ Twitter’s monetization troubles are well known in the industry (see e.g., Wired 2008).

²⁹ Although, in the short term, this problem can be removed through venture funding; the goal being to “capture market, monetize later”. This strategy, however, depends on successful implementation of the indirect monetization model, not assumed in the dilemma’s premises.

³⁰ “A consumer faces a switching cost between sellers when an investment specific to his current seller must be duplicated for a new seller” (Farrell & Klemperer 2007, 1977).

From this abstraction, the nature of differentiation can be deduced. Whether or not there is differentiation is irrelevant unless its nature leads to positive WTP. The payment hypothesis argues that WTP is zero, thus any condition that negates this argument invalidates the dilemma. The premise of competition assumes an association between competition, differentiation, and WTP, which are practical issues that the startup needs to consider in determining the validity of the hypothesis in its case³¹.

Price sensitivity is a key assumption, and a simple game demonstrates its meaning. Consider, for example, a game in which players can choose between free and paid versions of a product. The free version is of inferior but sufficient quality, whereas the paid version is of better quality although costly. Both players are price sensitive; that is, price is more important to them than quality.

Table 10 Price sensitive (both)

		B	
		<i>Free</i>	<i>Paid</i>
A	<i>Free</i>	2, 2	3, 1
	<i>Paid</i>	1, 3	1, 1

The paid version can be more desirable if price is not included. However, because it is, the dreaded cost makes price sensitive users prefer the free over the paid version. Both users want to avoid a situation in which they are paying and the other one is free riding. The free rider's payoff is 3, because the paying party helps to keep the platform free. The dominant strategy for each player is to move from paid to free (1 → 2 and 1 → 3). Hence, neither of them will pay.

Now consider the reverse, when the other player (A) is not price sensitive, but prefers the premium features of the paid version.

Table 11 Quality sensitive (A)

		B	
		<i>Free</i>	<i>Paid</i>
A	<i>Free</i>	1, 2	1, 1
	<i>Paid</i>	2, 3	2, 1

³¹ This estimation is required *ex ante* as the startup needs to decide on the monetization model. However, the decision is not necessarily irreversible, although moving from free to paid might be more difficult than *vice versa*.

Because A is not sensitive to price but quality, and the paid version offers better quality, A will always prefer the paid version, regardless of B's choice. This is similar to generators always preferring to produce content, except in a standalone sense. Whereas generators derive benefit from the existence of consumers (i.e., positive indirect network effects), paid users are indifferent to free users. Free users, however, enjoy benefit from paid users, because *in the long term* they help to keep the platform free. Therefore, the free user's payoff is 3 when there are paid users. From A's perspective, however, there is no free rider problem as he/she is not price sensitive. He/she will not switch from paid to free, and B will not switch from free to paid; thus, there is a stable *Nash equilibrium*³². Consider, however, that the free users now have an incentive to keep paid users on board. The startup can leverage this as a part of their UG strategy. Moreover, it becomes a *marketing problem* for the startup to find users who are more quality- than price-sensitive, and a *product-development problem* to provide such quality that satisfies them.

Second, low switching cost implies that any lock-in mechanisms are weak and, if fees are introduced, users can easily switch between alternative platforms. This invalidates 'bait and switch' type of solutions; for example, first offering free product and then charging for it. Given price sensitivity and low switching cost, the user would abandon the platform when fees are introduced. In the case of online platforms, switching costs are typically reduced by high interoperability (e.g., API access), advanced import/export functions offered by platforms that exclude proprietary storage of data, and the relatively small learning curve of new platforms as Web services might follow the same conventions (see Cappel & Huang 2007).

Third, price sensitivity implies that users choose the platform based on price and will therefore prefer free platforms to paid ones, even if this means sacrificing some quality or features, a type of behavior termed *satisficing* (see Simon 1956). Similarly, if a platform is initially free, to solve the cold start problem, but later turns to paid, to solve the monetization problem, that is, applying the *bait and switch* strategy, users will exit the platform. Given the number of substitutes, they will always have a fallback. Therefore, if the assumption of price sensitivity is correct, the payment hypothesis is true. Price sensitivity sets it so that users have low WTP. Note that these premises are neutral with regard to multihoming (Armstrong 2006); users might multihome or not, but the introduction of fees would prevent adoption.

Fourth, it must be noted that if a startup is successful in indirect monetization, it will not fall into the problem of free and the dilemma will dissolve. That is, indirect monetization is only a solution when it is successful; *a priori*, this can be difficult to determine, which is why the author hypothesizes that startup founders might be more likely to underestimate their ability to directly monetize and overestimate their ability to indirectly monetize.

³² Neither player can improve, given the choice of the other player (Nash 1950).

Moreover, the notion of competitiveness in the definition is important, but only indirectly. As noted, competition only matters if the lack of it is not due to a lack of demand; that is, in markets where there is no demand, there is no market although, at times, startups plan to create new markets. Second, the offsetting factor to competition is differentiation, by which firms are able to overcome competition. However, differentiation only matters if the differentiating factor is perceived as more beneficial by the user. Some startups are able to articulate differentiation although *in praxis* the difference can be trivial to end users.

Finally, the hypotheses are subject to false confirmation (see e.g., Chesbrough 2004), meaning that their truthfulness might be incorrect. Consider a hypothesis that is rejected even if it is true³³ or, conversely, a hypothesis that is accepted when it is false. This relationship between validation and truth is depicted in the following table.

Table 12 Truth and assumptions

		Reality	
		<i>True</i>	<i>False</i>
Beliefs	<i>True</i>	True	False positive
	<i>False</i>	False negative	True

To elaborate, in some cases users might exhibit behavior that is non-price-sensitive: behavior that exists both offline and online. For example, every day, some users pay Spotify for access to music, Netflix for access to movies, and Dropbox for virtual storage space³⁴. In cases where there is a motive to pay but the startups abandon the alternative based on the payment hypothesis, it is subject to a special case of confirmation error (i.e., false positive) that the author terms *illusion of free*. Under this condition, the startup is choosing *freefying* by default as it makes the assumption that, without facts and contrary to the truth value, users would not be willing to pay for the use of product, content, or access to a platform³⁵. Therefore, there is a risk of *false positive*: Users are willing to pay for the product, contrary to the founder’s belief. This is quite a significant risk as a startup faces a choice horizon that might include creating products for which a proportion of customers would pay, which is an opportunity neglected in the case of the false positive, and the choice horizon becomes constrained to free offerings. Therefore, the false negative might not only harm monetization but lead to neglecting the discovery of other types of product and market space, otherwise termed missed opportunities.

³³ Depending on the ontological position, truth can be defined as an objective property of the nature (e.g., a law of physics) or an interpretation of the ideal condition (i.e., “social law”).

³⁴ It must be noted, however, that none of these services incorporate UG as the content production mechanism. Nevertheless, this is irrelevant with regard to the premise of WTP.

³⁵ In brief, WTP is assumed to correlate with willingness to join. Were the reverse shown, there would be grounds to discard the dilemma.

As previously stated, the dilemma will dissolve if the startup is unable to successfully implement the indirect monetization model, as Google achieved by aggregating Web content. There are, however, empirical foundations (i.e., reported by failed founders) to believe that indirect monetization is not as straightforward as many founders assume.

Note that UG introduces some restrictions to monetization; firms cannot readily charge for amateur content due to uncertain quality, expected unwillingness to pay, and resistance from the users creating the content who might feel that their rights are violated if their content is monetized without revenue sharing. The typical monetization model is therefore indirect: content platforms delegate content creation to users instead of utilizing the firm's own resources, design a process through which the content is re-used to attract new users such as search engines and social sharing functions, and then monetize the content through indirect revenue models, typically advertising. Due to the problem between UGC and direct monetization, that is, the startup cannot directly monetize the free content provided by users without consumers' retaliatory effects, the strategies for monetization remain limited.

4.3.4 Remora's curse

The remora is a type of fish that attaches itself to a larger fish like a shark or even a boat. It rides along with its host and feeds on whatever comes by. The remora can also detach from its host, swim on its own, and survive. (Don Dodge)

Based on the evidence, startups can face greater than expected difficulties in achieving a sufficient degree of UGC; "sufficient" being enough to launch a self-sustaining process of content replication, or a critical mass. To overcome this hurdle, some startups opt for the *remora strategy*, which is to join an existing platform to gain access to its predominant user base or content, and in this way solve the cold start dilemma. In practice, this might mean developing applications on top of existing platforms, such as Facebook, Google, or Twitter, and leveraging their application programming interfaces (API)³⁶ and user bases; essentially, gaining access to network effects without generating a critical mass. The solution might appear solid in theory, and there are several cases in which it has worked well (e.g., acquisition³⁷ or direct

³⁶ API, in the case of Web applications, enables access between applications; in platforms terms, interoperability.

³⁷ Instagram, for example, was built to be compatible with Facebook, and was acquired by Facebook for \$1Bn in 2012 (Constine & Kutler 2012).

monetization³⁸); however, our sample of failed startups also showed its limitations. The purpose of this chapter is to analyze these limitations.

The dilemma of a remora’s curse takes place when a platform entrant needs to decide whether to integrate a critical functionality relating to distribution, marketing, or monetization to a predominant platform at the cost of losing power in those areas, or to develop an independent solution at the cost of losing access to the platform host’s pre-existing user base, content, distribution, monetization system, or any other asset to which the integration would grant access.

Consequently, remora’s curse addresses the choice of either developing a product on top of existing platform (i.e., become a ‘remora’) or not (i.e., start an independent platform); the former gives access to a pre-existing user base or content while the latter requires that the user base or content be created separately without the “kick-off” provided by the host platform. In both choices, the startup pays a tradeoff cost, as depicted in Table 13.

Table 13 Remora’s choice

	Join	Not join
Tradeoff	Lose power over technology, marketing, and monetization	Lose access to the pre-existing user base or content (i.e., cold star dilemma)

Therefore, by joining an existing platform³⁹ as a supply-side participant, a startup gains access to an existing user base or content but increases its dependency on the platform owner, thereby in effect trading off 1) *technology power*, 2) *marketing power*, and 3) *monetization power* to a) *the distribution function* and b) *the marketing function*, which are delegated to the host platform⁴⁰. Technology power implies that the host influences the startup’s technology choices, and the startup incurs initial integration costs and, whenever the host platform’s specification changes, continuous adaptation costs. This can be regarded as a form of asset specificity, as discussed in the literature subchapter. Losing control over marketing and monetization refers, respectively, to the inability to differentiate via marketing, as the platform poses marketing restrictions, and the inability to choose a monetization model as this is imposed by the host. In effect, the startup will also forego customer relationships

³⁸ Zynga, for example, charges the user for virtual goods sold on the Facebook platform, and generated revenue of \$1.2Bn in 2012 (Zynga Inc. 2013).

³⁹ Such as Facebook, Google, and Twitter, or iOS, Android, and Windows mobile.

⁴⁰ Distribution is delegated as the startup’s platform is accessed through the parent platform’s interface. For the same reason, marketing is expected to be self-organizing as users will find the startup’s product inside the host platform.

because it is the platform owner that retains customer information⁴¹. The host has more information on the users but it restricts sharing it due to 1) privacy concerns and 2) the competitive value of information. Capturing value is another conflict: while in the platform, a remora can never reach an outcome by which its revenue supersedes that of the host. This is theoretically impossible when the host imposes a revenue sharing scheme and blocks all other means of monetization⁴².

Exhibits of remora's curse are presented in the following table.

Table 14 Exhibits of remora's curse

Example
[1] <i>"We exposed ourselves to a huge single point of failure called Facebook. I've ranted for years about how bad an idea it is for startups to be mobile-carrier dependent. In retrospect, there is no difference between Verizon Wireless and Facebook in this context. To succeed in that kind of environment requires any number of resources."</i> (Rafer 2009).
[2] <i>"The killing blow was when Facebook changed its app platform to make things less spammy, and thus less viral. We were toast."</i> (Parr 2011a).
[3] <i>"Predictably and reasonably, Facebook acted in their own interest rather than ours. Their Summer 2008 redesign supported Facebook's goals elegantly but hurt our publishers and us in ways that became clear just weeks after we'd raised another ~\$2M."</i> (Rafer 2009).
[4] <i>"We were doing some time-consuming processing on gathered data so there wasn't a big time buffer we could use. With each downtime (the website worked but with no actual data it didn't make much sense to use it anyway) we had to wait until a backlog was cleared. Chances were good that by this time we had another issue to deal with – a bug in the code, on of auction platform's changing the structure of their data, a simple hardware malfunction, or running out of disk space."</i> (Brodzinski 2009).
[5] <i>"[Facebook] wasn't a perfect fit for the Nouncer services, but it still fit in with the overall strategy and philosophy. It also looked like an easy thing to do with a big marketing potential. The result was JabAbout, a Facebook application using the social graph to propagate short messages by following the friends-of-friends paths. JabAbout failed to build a user base and was eventually shutdown."</i> (Hammer 2008).
[6] <i>"Mint's dependence on Yodlee apparently suppressed their acquisition interest among companies that knew Yodlee well (such as Microsoft, Yahoo, and Google); since we had developed our own technology for aggregation, we didn't have that particular problem, and in fact had some acquisition interest simply for the aggregator we'd built."</i> (Hedlund 2009).

The exhibits demonstrate remora's curse from several angles. First, a *technology lock-in* [1] indicates a situation in which continuous investments from the startup are required to keep its product up-to-date according to the technological specifications of the platform owner. This might limit the available technologies to some extent while

⁴¹ This was a major concern for record labels considering distribution with iTunes, as Apple would hold customer information (i.e., customer relationship); eventually, Steve Jobs was able to convince them of the mutual benefit (Isaacson 2011).

⁴² The revenue of a remora grows proportionally to the host's share; so that $a/b \rightarrow k(a/b)$, in which $k =$ growth factor, $a =$ host's share, $b =$ remora's share; given that $a > b$ and $a + b = 1$.

increasing dependence on the host's technological choices. If the choices are not optimal for the startup's product, this will reduce its competitiveness. Further, changing functionality [2] requires the startup to react and organize its product development according to that of the platform owner, and it pays adaptation costs [4].

The bigger issue, however, is the lack of control with regard to the user base. At any time, the platform owner can restrict or deny the startup's access to users, justified as a change of service terms [3] or platform design [2]. Losing access to users may also occur due to a technical breakdown. In consequence, the solution to the chicken-and-egg problem dissolves [5].

Moreover, the platform sets rules for marketing over which a startup has little control. For example, the platform might give additional visibility to particular products and not others, thereby distributing competitive advantage. A startup can have little control over its visibility in the platform as it cannot influence the rules⁴³, and in general advertising is not allowed⁴⁴. Overall, these limitations may reduce investors' willingness to invest in a startup [6].

As noted, adaptation costs arise when the startup is dependent on the platform as a source of data. First, it has to build the product so as to be compatible with the platform. Second, it has to account for changes that might easily break the flow of data and, therefore, its own product. Third, the platform owner can restrict access to data, rendering the product useless. Coordination problems of this kind, therefore, relate to the functionality of the product, and apply especially to startups following the *aggregator* content model⁴⁵ whereby, in theory, the startup's product integrates into several host platforms to fetch data. This solves the cold start problem well as the fetched content will enable demand-side benefits; for example, the more websites indexed, the better the search engine, all else being equal.

By aggregating data from several websites, the startup might gain an *in praxis* a solution to the cold start problem. However, at the same time, it becomes dependent on these data sources; any change in which necessitates an adaptive response or the startup's platform loses its ability to function⁴⁶. The more aggregated platforms (i.e., data sources), the higher the risk for coordination problems; however, the less the dependency on individual sources, as they become expendable in a large selection, and the more changes by platform owners, the higher the risk of coordination

⁴³ However, if the platform is fair and the rules are transparent, the startup is able to increase its position by adapting to them and outperforming competitors. Equally in this case, it is not affecting the marketing variables set by the platform owner, but only adapting to them.

⁴⁴ To compensate for the lack of marketing tools provided by platform owners, some developers have created tools for peer marketing. In them, applications exchange users on a 'give one, receive one' basis; the revenue comes from selling a small portion of slots to advertisers.

⁴⁵ Assume that all websites in the world suddenly deny Google's access to their content; the search engine would instantly become worthless. As Google provides indirect network benefits (i.e., a large number of searchers) this is unlikely to happen. Further, Google is inherently hedging its risk by diversifying the aggregation to billions of sites; therefore, its dependence on an individual host approaches zero.

⁴⁶ A real-time service loses matching ability; a static platform becomes outdated.

problems. Further, the startup is forced to constantly monitor the health of the third party data source. Note that aggregation is a special case when joining a platform; its purpose is not to acquire users directly (*as in*: host platform → startup's platform), but to provide benefit for, often, existing users by offering them content from other sources, or to utilize the content indirectly through social interaction spillovers or search-engine indexing, which can lead to website traffic.

Consider two “degrees” of integration:

- **Full integration:** building the product inside the host platform (i.e., turning to a full complement).
- **Selective integration:** accessing the host platform's functions and user base but retaining, for example, distribution and marketing⁴⁷. These types of service are sometimes termed ‘mashups’.

Due to its definition, remora's curse applies to both degrees of integration. The severity of dependence might be less in full integration as user base and marketing freedom is retained. However, if the access provided by the host platform is critical for the functionality of the remora platform, as is assumed in the definition, the dependency is also critical.

Moreover, it is assumed that most users find products, including those offered by the startup, within the platform. That is, the remora retains beyond-platform marketing capabilities, although they are mostly irrelevant when distribution is delegated to the host. For example, currently, leaderboards and rankings are controlled by the host in most online platforms. However, if this assumption was denied and the startup was able to successfully market so that users connect to the platform to find the product, the marketing dependence would be broken. This is not, however, a solution to the dilemma as the platform owner retains control of technology, distribution⁴⁸, and monetization. If revenue sharing works in favor of a startup *in praxis*, this does not remove the fact that, in theory, the host can change the terms; although, while there is competition for complements, a choice such as that would most likely result in inter-platform competition.

While any of the above functions are considered critical, removing them partially from the host's control does not solve the dilemma. However, partial integration can be sufficient in solving the cold start dilemma; more precisely, the startup might be able to draw users from its host to an extent whereby it obtains a critical mass. Even if the host then exercises its power, this is not detrimental to the startup as it has already gained a critical mass and is now self-sustained.

⁴⁷ In selective integration, delegated functions can be arbitrary based on functionalities offered by the host and the startup's strategy.

⁴⁸ Even in selective or partial integration, whereby distribution would not be delegated, the problem will persist while the host controls any of the critical functions.

The risks associated with delegation are presented in the following table.

Table 15 Risks of delegation

Delegated function	Risk
Technology	Technology lock-in
Marketing	Favoritism
Monetization	Unequal revenue sharing / no revenue sharing
Distribution	Breakdowns, changing terms

In a typical setting, the remora's expected benefit of joining relates to distribution. In aggregation, the product is distributed outside the platform, therefore with distribution and marketing costs, whereas the platform brings, in theory, delegation benefits. However, this matching, from the perspective of any startup other than the category leader, is not automatic, and herein lays the fallacy of believing that marketing investments are not required. In other words, intra-platform competition exists even in the presence of network effects, and due to the host's incentives to promote the strong remora at the expense of weak remoras, participating in a platform as opposed to being independent can in fact become detrimental; that is, the required cost for differentiation exceeds coordination benefits provided by the platform, which is easily perceived when understanding that *fair treatment* is not a profit-maximizing strategy of the host. Rather, it benefits from favoritism; particular killer apps bring much more revenue, and are much more difficult to replace, than the long tail of complements⁴⁹.

Consider, for example, a simple game with two players: remora and the host. Two versions will be presented: first, a version in which the remora is weak, meaning that the host does not believe it will sell. In the second, the remora is strong in the sense that the host believes in it and will give it additional marketing support (i.e., exposure). This is a sequential game with three turns: first, the remora decides whether to join or not; second, the host will either sell its product or not⁵⁰; and third, the remora will decide to stay or leave.

The players make investments which they might lose, and gain benefits which they might keep. Sales are recurring (i.e., third round) and parties engage in revenue sharing. Network effects are assumed, as the following figure explains.

⁴⁹ Consider App Store with millions of applications. The existence of this many complements is beneficial to the platform owner and also the end user, given that his search cost of having so much choice is not paramount, which is another reason for the platform owner to apply favoritism. However, the majority of developers are disadvantaged as their offering cannot be easily discovered (Salminen & Teixeira 2013).

⁵⁰ This simplification equals the remora's expected benefits described earlier; that is, acquiring users or content.

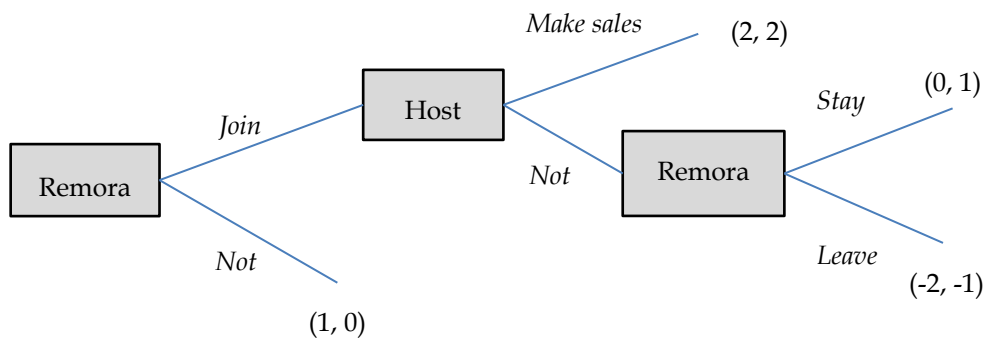


Figure 3 Weak remora

In the first stage, the payoff is expected benefits. As the remora will avoid marketing investments, such as advertising and hiring a marketing manager, it has a positive payoff. The product as a stand-alone would have some intrinsic value, but less than when combined with the host platform's assets (i.e., expected network effects). If the host makes sales, each party's payoff increases in proportion to that of the other party (i.e., revenue sharing⁵¹).

Not selling a weak remora's product gives a higher payoff to the host as it can keep the incremental network value without extra effort; comparatively, it incurs an opportunity cost of not selling the strong complement, which is why the payoff for not selling is higher than for selling. However, the host gets a positive payoff for the remora joining as the remora provides an increment to its complement base⁵² (i.e., marginal network effect).

If the remora defects, it will lose its platform-specific investment. It will also need to redeploy its product and compensate for loss of marketing delegation, which is similar to the hold-up problem. However, it is assumed that the remora can recover some learning effects by redeploying the product either to independence or to another platform. Its departure will cause the host to lose the incremental value. If it stays, it incurs no additional cost, but can also resort to multihoming, which is not considered in the game.

At this point, keeping the remora will not produce additional gains for the host as it does not expect the remora to sell but to provide perceptible value. However, losing the remora would mean the loss of its incremental value.

⁵¹ For example, Apple shares revenue with its App Store developers using a 70/30 ratio, in favor of developers (Gans 2012).

⁵² According to the indirect network effects assumption, the complement base, as a whole, provides a sales argument for the demand-side users.

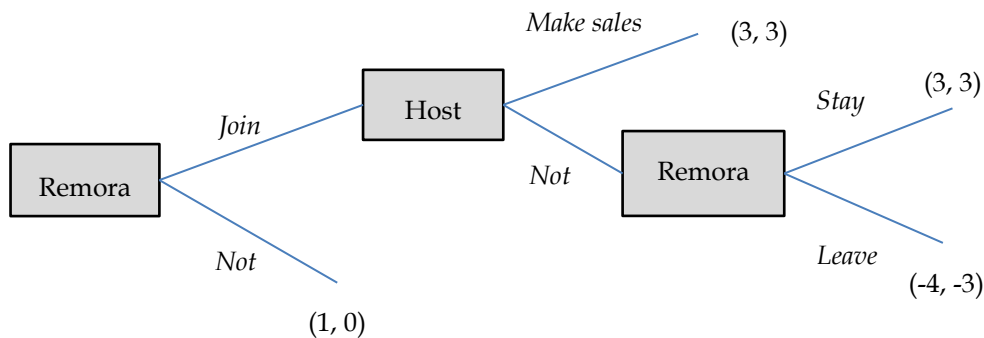


Figure 4 Strong remora

By joining, the strong remora gets the same expected delegation benefits as the weak one. At this point, it will only provide the incremental network utility. Not joining will also produce similar effects as in the case of a weak remora.

In this case, the host can make high sales and is incentivized to sell. If changing, the host would lose both the incremental network effect and the sales effect. The strong remora would lose its platform-specific investment and sales effect. Thus, both parties have an incentive to continue collaboration⁵³. Here the demand-side user base (i.e., indirect network effects) becomes important for the strong remora; while, due to lack of exposure, theoretical network effects are important for the weak remora. Strong remoras actually realize high payoffs from participation.

Essentially, expected network effects are crucial with regard to the failure of a weak remora. While it provides an actual marginal increase as a network effect for the demand-side that the host can monetize, the weak remora gains nothing in return. For the weak remora, if it is a possible strategy, becoming strong before joining the host platform would provide a potentially better way of investing its resources than joining as a weak player. From the host's perspective, because payoffs are similar in the first step, it would need to distinguish between strong and weak remoras (i.e., "cherries and lemons", following Akerlof's (1970) terminology).

For the host, intra-platform competition is often desirable; startups represent supply-side complements that increase demand-side utility⁵⁴. For startups, the reverse can apply: the greater the competition, the more difficult it is to acquire users or customers, and the remora's marketing delegation advantage dissolves. The more the startup commits relationship-specific investments to the platform, the higher the degree of lock-in. In addition, motivation to join a platform might arise from the expectation that user acquisition is less costly within than outside the platform.

⁵³ Alternatively, the strong remora might consider multihoming to several platforms, which is not considered in this game.

⁵⁴ The logic is such that greater selection increases customer benefit, a standard assumption of indirect network effects.

However, when intra-platform competition is high, this is less likely to be the case because other startups and established firms compete over the same users. The competition can, in fact, lead to an outcome whereby user acquisition is equally, or more, costly than outside the platform⁵⁵. As a result, the perceived marketing benefits relating to customer acquisition can dissolve.

This implies that even if there is a potential market, and network effects apply so that the increase in end users is due theoretically to the startup, the startup is forced to compete within the platform. Therefore, these types of network effect are here referred to as ‘theoretical network effects’, which are theoretical (i.e., potential) as they do not realize under high intra-platform competition *unless* the startup is a category leader. In other words, the network effects are not shared equally; some participants enjoy them, while others, perhaps the majority, depending on the competition, do not. Therefore, network effects that do not take place in the real-world setting are worthless to the startup, and it gains no advantage in joining a platform with strong platform effects compared to the situation of starting a platform without a critical mass⁵⁶.

Furthermore, the remora strategy is distinct from utilizing a platform as a traditional marketing channel because of the integration of one or many critical functions into the host platform. For example, a user cannot access the startup’s platform in a specific platform without first joining the host platform (i.e., full integration), or the user might not access it beyond the host platform if API access is not available (i.e., partial integration). If the host platform is a monopoly, then joining it might give the remora access to some monopoly benefits⁵⁷. In contrast, when there is effective inter-platform competition whereby users are distributed between several competing platforms, it makes sense for the startup to follow this pattern by diversifying. While a subset of users will treat platforms as mutually exclusive and choose one among them, another subset will adopt several competing platforms simultaneously, regardless of interoperability. The platform literature respectively refers this to singlehoming and multihoming.

By multihoming, in the supply side, the startup can gain access to both multihoming and single-homing users, given that the host platform does not require exclusivity. In contrast, choosing one host platform (i.e., single-homing) excludes users who singlehome to a different platform than that chosen by the startup.

As the author has argued, under some circumstances, the expected benefits of the remora model do not materialize. If there is a reason for the startup to believe so *ex*

⁵⁵ Such a situation is exacerbated when the platform owner reduces diffusion subsidies within the platform, thereby increasing friction between the startup and potential users; for example, when Facebook reduces visibility of application invites or organic post visibility in user streams.

⁵⁶ Theoretically, the start-up gains a diminishingly small advantage compared to a pure cold start; although, the more competitive the market becomes, the more the start-up becomes a “long tail” provider. In brief, such a market exhibits winner-takes-all dynamics; however, *not* due to network effects but to favoritism and user preferences.

⁵⁷ Such as user adoption, so that in the absence of alternatives, the host platform keeps growing the number of users.

ante, the dilemma dissolves as there is no rational reason to join. However, under no conditions will the potential power of the host be negated, regardless of whether it is enforced or not. The sole relaxation of the dilemma's validity from this side would be when integration only touches non-critical functions, but this is not in accordance with the definition presented here. The host choosing not to exercise its power is not a relaxation because, although it leads to a favorable position for the remora *in praxis*, the benefits are not stable as there is uncertainty concerning the host changing its strategy.

Another case is *take it all*, when the host is lazy in exercising its power in any of the critical dimensions. In such cases, the remora can in effect transform into a leech, gaining users while retaining all benefits. However, again note that the dilemma in effect persists as, at any time, the host can change the rules of the game. Twitter is a well-known industry example of a "lazy host" that grants free access, does not enforce revenue sharing, and is built as a very open communication platform with low lock-ins to the website. For example, Facebook has implemented strong lock-ins because users have to log in to its interface for each interaction, and are shown advertising; Twitter can be accessed from anywhere without realizing additional revenue⁵⁸. Nevertheless, Twitter has also been known to break the rules of sound business logic in other areas, mainly monetization. In general, platforms expect reciprocity; even if not charging their complements, they expect them to provide indirect network effects that can be monetized according to their monetization model.

However, the loss of user base must be discussed; more precisely, the definition is 'users' not 'customers'. In other words, we return to the issue of 'user versus customer'. It is therefore possible to argue against the premises of the problem by stating that users are only desirable if they can be converted to revenue, because there is an implicit assumption that the startup wants users. In fact, this becomes an issue when the platform owner is possessive about the opportunities to monetize; for example, as is the case with Apple, but currently not Facebook, restricting available monetization methods. As such, assuming indirect monetization is not possible, free users would not be worth the startup's efforts as the platform can internalize all complement benefits relating to monetization; that is, there is no revenue sharing.

In sum, remora's curse addresses situations in which platform participants are at the mercy of the platform owner, which often aims to control revenue sharing within the platform; for example, Apple's App Store dictates the revenue sharing terms for developers. However, the reverse might occur if the platform is open; that is, it enables free access to its data and does not control monetization. This case is clearly demonstrated by Twitter: for a long time, third party service providers tapped into

⁵⁸ However, the behavior of platform complements is not "opportunistic", as they have no other choice. In opportunistic behavior, the startup chooses a strategy, among other strategies, which maximizes its profit at the platform host's cost. By this logic, Twitter is a "non-profit" platform, and should be excluded from commercial analyses.

tweets generated by Twitter without contributing anything in return; applying the animal analogy, the remoras had become leeches. These included services to monitor tweets, set alerts, and manage tweet streams. Counter-examples such as these do not remove the existence of the dilemma because Twitter can willingly exercise its power, which it has begun to do (Nickinson 2013).

The main risks of falling victim to the platform owner's strategic behavior can be attributed to platform design (i.e., rules, terms, and specifications) and unpredictable changes, in which central functionality is altered with no influence from the participants. Although joining an existing platform, or becoming a 'remora', might appear to be a *low hanging fruit*, or an easy solution to the cold start problem, the startup should be cautious about the potential hazards. As established in the introduction to this chapter, startups, as is the case with most organizations, are obliged to trade off strategic alternatives. Therefore, joining a platform is not a trivial matter as it can lead to strong lock-in effects and might be irreversible, especially considering the startup constraint of *limited runway* (i.e., depletion of time and resources).

Nevertheless, benefits of joining an existing platform probably exist in some form. It can be assumed that the advantages are strongest when the product category or industry is unfamiliar to potential customers, and therefore requires strong persuasion, market education, and heavy investments in promotional activities. However, each platform has its own competitive dynamics that might not always be fair and which can, in fact, lead to complete dissolution of the expected benefits. Although it might appear to be a good strategy for solving cold start problems, joining a platform does not automatically secure more customers due to intra-platform competition and the above-mentioned dynamics (Table 25). The platform owner's aim is, in most cases, to encourage competition among participants within its platform. An exception to this goal exists when protecting category leaders (i.e., *killer apps*) due to their higher benefit to the platform. In such cases, new entrants will have difficulty because incumbents are protected by the platform owner, for example, through dominant ranks in application listings, thereby increasing the risk of a *winner take all* outcome.

5. Summary and discussion on dilemmas

The idea for dilemmas was born from reading the material. Initially, it was discovered that founders identified and named them in their post-mortem stories. For example, one founder mentioned a "cold start problem", which was then also discovered in other cases, although not by the same name.

The cold start dilemma is applicable to all platform types considered in this study; a particular number or amount (i.e. critical mass) of users or content is needed to evoke willingness to join a platform, whether the platform is based on content, social, or

exchange interaction. Both the cold start and the lonely user dilemmas are chicken-and-egg problems, and relate, respectively, to content platforms and social platforms, the latter requiring an active user base or content to generate growth through network effects. In addition, marketplaces (i.e., exchange platforms) face liquidity needs. It is negligible whether liquidity in their context is understood as content (e.g., product listings) or users (i.e., buyers and sellers).

The cold start dilemma relates to content platforms with interaction such as content creation and consumption, and also transactions in the context of exchange platforms, whereas the lonely user dilemma relates to social platforms with interaction such as joining the platform; typically, users register or otherwise subscribe as followers. Both, however, aim at UG effects, so that users' actions lead to a desired response from other users, such as content contribution, sharing, and invitations⁵⁹.

Moreover, the cold start dilemma can be defined as a problem of one-sided content platform, when users are homogeneous, or a two-sided problem, when users are divided into consumers and contributors of content. Similarly, the lonely user problem can be a problem of similar side critical mass (i.e., friends or acquaintances are required to join and actively utilize the platform), or a two-sided problem (e.g., men and women finding each other in a dating website). The only platform type that is categorically two-sided is the exchange platform, which always requires different sides (i.e., buyers or sellers) for interaction to take place.

In terms of implications, it is important to distinguish pure content platforms from social platforms because contributing content can be regarded as more demanding than engaging in social interaction; thus, different types of incentive might be required. Then again, for exchange it is important to build liquidity; a good volume of both sellers and buyers, so that goods are sold at appropriate prices. The incentives of the platform owner and traders are usually well aligned as the rewards of exchange platforms tend to be tied to the volume of transactions taking place in the platform. Finally, social effects are associated with UG; users, for example, upload videos on YouTube for others to watch, not primarily to gain economic benefit⁶⁰.

The monetization dilemma and remora's curse are applicable to all platform startups; the company needs to be financed which requires direct or indirect monetization, that is, charging the user for access and/or usage or charging a third party, most typically advertisers. In a similar vein, it depends on the user/content acquisition strategy whether the remora model is applied and therefore applicable, which is possible in all platform types: content platforms can attempt to source content, social platforms users, and exchange platforms product listings.

⁵⁹ If the users are classified as one group, it is termed a one-sided platform. If they are classified as two complementing groups, it is termed a two-sided platform. If they are classified as three or more groups, it is termed a multisided platform.

⁶⁰ Although YouTube offers a partnership program for the most popular content providers.

It is typical that attempts to solve one dilemma result in the discovery of another. This principle is demonstrated in the following figure.

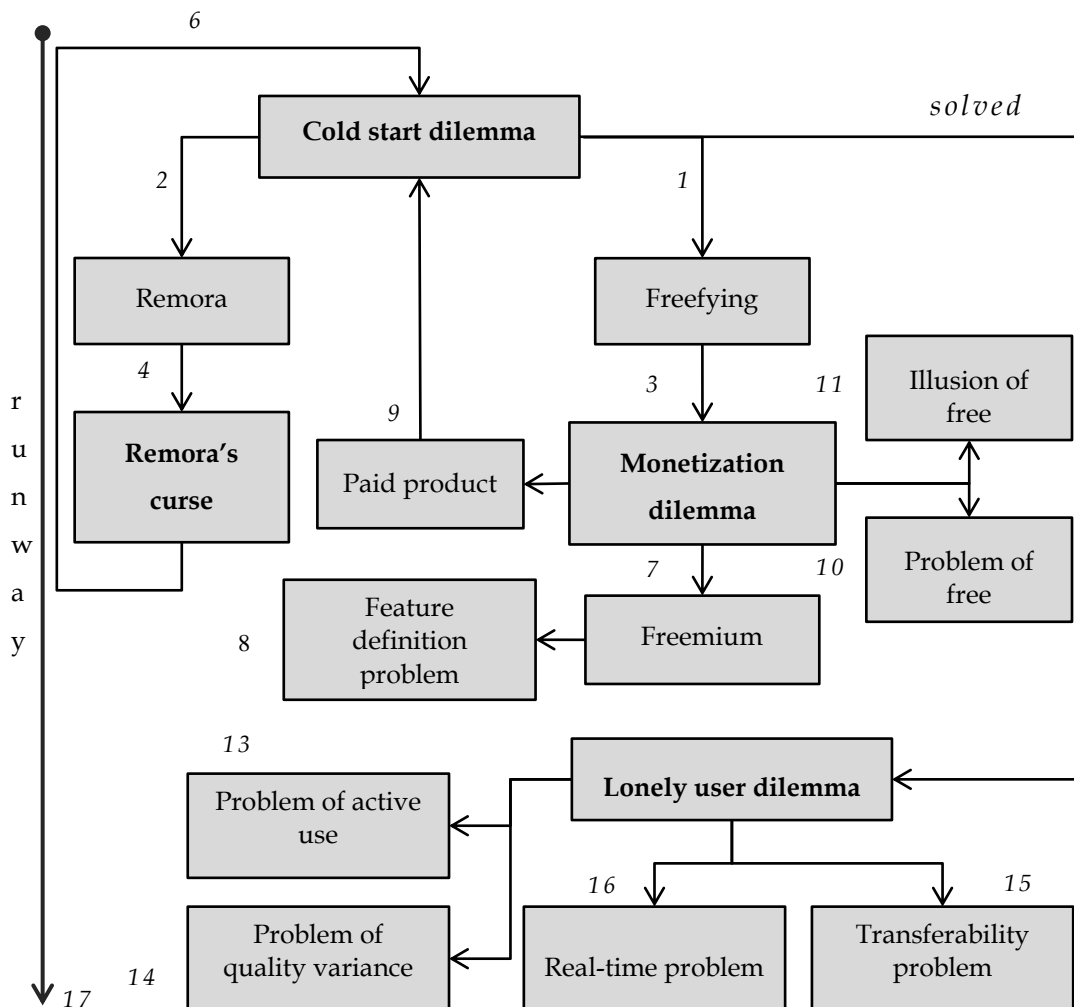


Figure 5 Dilemmas and associated problems

If solving the cold start problem or lonely user problem by offering a free product [1], the startup faces the monetization dilemma [3]. Therefore, even successfully building the user base does not guarantee business viability. This is due to the fundamental difference between a customer and a user; the former brings in revenue, while the latter brings a cost that needs to be covered by indirect monetization. There is a discrepancy between the growth of the user base and growth of revenue that is a consequence of indirect business models not being perfectly elastic to the growth of user base. This is implied, for example, in Goldfarb's (2003) model, based on the assumption that users do not provide the revenue directly but it comes from

advertisers⁶¹. It then follows that users are not worthless while also not being as valuable as many startup founders would like to think. Based on the author's analysis, seeking customers, even at the risk of "scaring away" users who are unwilling to pay, seems a more recommendable strategy⁶². As a minimum, the startup should look for ways to diversify indirect monetization instead of being dependent on advertising. Further, the lack of consideration for business viability also concerns the platform literature; for example, Evans and Schmalensee (2010, 5) noted "*we do not address whether a platform that attains a critical mass would in fact be profitable; this would require the explicit consideration of costs and other revenue.*"

To solve the cold start dilemma, the startup is tempted to join a platform with a pre-existing user base [2], anticipating that the barrier for users to join is lower when they have already committed to the host platform. This comes at the cost of giving away power (i.e., remora's curse [3]). Whereas remora's curse addresses managing a relationship with the platform owner, the cold start dilemma relates to becoming the platform owner. Particular problems of a remora include platform dependence and potential hold-ups. Realization of remora's curse, that is, the host platform cutting access [6] to users or content, will in effect lead the startup back to the cold start problem, but only given that it has failed to reach a critical mass.

When the startup solves the monetization problem through the freemium model [7], it is left with a problem of feature definition [8]. In other words, giving away too many features leads to low conversion from paid to free user, whereas giving too little away leads to lack of adoption in the first place. Another option is paid product [9], although this can lead to a similar problem of lack of adoption (i.e., cold start). Note that there are two different states for users' WTP: positive and negative. For negative WTP, paid products always result in defection, and there is a problem with free [10] because the startup is forced to subsidize. However, if WTP is positive, then the startup risks an illusion of free [11] in which it offers a free product, even though the users would have been willing to pay.

With regard to users, different problems arise before and after they join a platform, so that:

Before joining → cold start dilemma

After joining → lonely user dilemma, problem of active use & quality variance

The *problem of active use* [13] implies that even after solving the cold start problem, the startup is at risk of losing the achieved critical mass if the users become

⁶¹ The assumption can be extended by arguing that the advertising market has its own dynamics, which means that users in one website are not interchangeable with those in another with regard to their advertising value. For example, consider Friendster that, when selling advertising space to American companies, noticed their visitors mostly comprised Filipino consumers (see Chafkin 2007).

⁶² This line of thinking is based on the idea that not all startups can become category leaders (e.g., Facebook) that are able to accumulate hundreds of millions of page views per day, and thus attract advertisers' interest.

inactive. This can cause ‘negative tipping’, which is essentially the reverse of exponential growth. The *problem of quality variance* [14] will, in effect, require the startup to introduce either manual or automatic monitoring mechanisms. By applying UGC logic, startups assume that the user base is self-controlling; thus, the platform offers tools such as a reporting function and recruits some active members as moderators of quality. However, even if the users are active in keeping misconduct in check, the problem arises when the low-quality content is not malicious but otherwise not interesting to other users. For example, consider the case of an indie music portal that failed due to low-quality bands (Hagiu & Wright 2013). It seems reasonable to assume that, in some cases, the startup needs to incur monitoring and intervention costs to assure that the user-generated content matches the interest of other users⁶³.

Coincidentally, the runway [17] keeps depleting while the startup determines the problems. If founders are unaware of platform-specific issues, as many of them were in the sample, it will take them some time to understand the problem, and then some more time to think of potential solutions. Then, they might run into additional problems. In contrast, by being aware of potential risks, the startup is able *a priori* to prepare a range of solutions for multiple dilemmas at the same time.

Furthermore, relying on UG aggravates the cold start dilemma. Instead of in-house production or syndication through partners to acquire customers and content, the startup expects users to play this role. When the process fails, the startup can find itself looking for “plan B”. However, at this stage, it might be too late, as exemplified by one startup’s story:

"We modified our technology to be a very flexible and scalable platform from which we could launch any type of application, for any client, in any industry. We thought we could position our solution as helping brands create a comprehensive distributed touch point strategy by complementing their presences on Facebook and Twitter with a presence on IM [instant messaging]. The plan was to partner with marketing agencies as well as sell directly to clients similar to the approach taken by providers of custom branded widgets, Facebook apps, and mobile apps. This strategy eventually produced some great results but it was a case of too little, too late. When we finally decided to pivot we had already spent most of the capital raised in our seed round."

The end of the runway signifies failure. In the absence of financial buffers, the runway might not provide a sufficiently long period of time to solve the problems. In contrast, venture funding, although providing resources, can lock in some choices, which prevents a later adaptation (i.e., *pivot*). Furthermore, venture funding can

⁶³ For example, refer to YouTube’s tactics of getting video material from attractive women by posting on Craigslist (Evans 2009a, 113).

impose a situation of “go big or go home”, which might negate the apparent freedom afforded by the funding⁶⁴.

Finally, there are two specific problems associated with the lonely user dilemma. First, the *transferability problem* [15], which implies that a critical mass is not automatically transferable from one context (e.g., location, niche market, or demography) to another context (e.g., another city or user demography). Second, the *real-time problem* [16], which implies that, in particular circumstances, the emergence of a match between parties of a two-sided platform (i.e., network effects) is dependent on time. An empty chat room is an example: no matter how many users have registered, if none are present, their value at time t is zero for the only user.

This also marks how the cold start and lonely user dilemmas differ: content is static while social interaction is dynamic⁶⁵. Registration does not guarantee content production (e.g., becoming an active user) and content production does not necessitate registration or other type of subscription. Therefore, the root of these two motivational problems differs. Simply put, it is assumed that users do not generate content for *exactly* the same reasons that they join a social network, although there might be an overlap. More precisely, their behavior can involve spillover effects.

In sum, this chapter has shown empirical grounding to the chicken-and-egg problem presented in the platform literature. More importantly, the study has shown that the problem 1) can take specific forms (i.e., cold start and lonely user) based on the type of coordination required (e.g., timeliness), and 2) is not isolated, although some of its potential solutions applied by the failed platforms startups are associated with further dilemmas; for example, the monetization dilemma and remora’s curse. This is an important finding as most of the literature considers the chicken-and-egg problem in isolation. It is argued here that potential solutions can aggravate the platform startup’s problems in the big picture; for example, by denying monetization or making it dependent on the host platform’s strategic choices. Hence, solving the cold start problem can come at a significant cost, and thus 3) potential solutions need to be considered in terms of their impact on cascading dilemmas and problems.

⁶⁴ This was conceptualized as “Peter Pan’s dilemma”, although is not discussed thoroughly in the study.

⁶⁵ However, content can have different modes of freshness. A good treatment to the topic is given by Kim and Tse (2011) who study knowledge-sharing markets and argue that there is both knowledge that expires rapidly and knowledge that remains valid for a long time; although, while the content is static in both cases, its benefit to the user is dynamic. For example, consider yesterday’s news that is not so valuable today.

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