

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Kemell, Kai-Kristian; Feshchenko, Polina; Himmanen, Joonas; Hossain, Abrar; Jameel, Furqan; Puca, Raffaele Luigi; Vitikainen, Teemu; Kultanen, Joni; Risku, Juhani; Impiö, Johannes; Sorvisto, Anssi; Abrahamsson, Pekka

Title: Software Startup Education : Gamifying Growth Hacking

Year: 2020

Version: Accepted version (Final draft)

Copyright: © 2020 Springer

Rights: In Copyright

Rights url: <http://rightsstatements.org/page/InC/1.0/?language=en>

Please cite the original version:

Kemell, K.-K., Feshchenko, P., Himmanen, J., Hossain, A., Jameel, F., Puca, R. L., Vitikainen, T., Kultanen, J., Risku, J., Impiö, J., Sorvisto, A., & Abrahamsson, P. (2020). Software Startup Education : Gamifying Growth Hacking. In A. Nguyen-Duc, J. Münch, R. Prikładnick, X. Wang, & P. Abrahamsson (Eds.), *Fundamentals of Software Startups : Essential Engineering and Business Aspects* (pp. 269-277). Springer. https://doi.org/10.1007/978-3-030-35983-6_16

Software Startup Education: Gamifying Growth Hacking¹

Kai-Kristian Kemell¹^[0000-0002-0225-4560], Polina Feshchenko¹, Joonas Himmanen¹, Abrar Hossain¹, Furqan Jameel¹, Raffaele Luigi Puca¹, Teemu Vitikainen¹, Joni Kultanen¹, Juhani Risku¹, Johannes Impiö¹, Anssi Sorvisto¹, and Pekka Abrahamsson¹^[0000-0002-4360-2226]

¹ University of Jyväskylä, 40014 Jyväskylä, Finland
{kai-kristian.o.kemell | pekka.abrahamsson}@ju.fi

Executive Summary. Marketing is a vital activity for software startups as they seek high growth. A specific type of digital marketing, growth hacking, in particular has attracted a lot of attention in software startups. Growth hacking is about utilizing low cost marketing practices and existing platforms to rapidly increase the user count of a service. Though topics related to growth hacking such as marketing on a general level have been extensively studied in the past, growth hacking has not seen much direct interest in the academia thus far. As a result, we currently have few tools to teach growth hacking in startup education. In this chapter, we present two board games intended to serve as an introduction to growth hacking.

1 Introduction

Though most companies are concerned with growth, for startups growth is typically far more vital than it is for more mature organizations. Strategies for growth are various. In terms of growing through user or customer acquisition, marketing is a key activity. Marketing strategies range from e.g. digital viral marketing to traditional forms of display advertising done through television advertisements. As startups operate under a notable lack of resources this usually limits their marketing options compared to more mature businesses.

Growth hacking is a marketing strategy [11] that focuses on low cost practices and using existing platforms in creative ways. This makes it well-suited for startups, and indeed, growth hacking as a construct was originally discussed in relation to startups. Currently, few academic studies directly related to growth hacking exist, even if soft-

¹ The definitive version of this chapter was published as a scientific paper in: Kemell, K.K., Feshchenko, P., Himmanen, J., Hossain, A., Jameel, F., Puca, R.L., Vitikainen, T., Kultanen, J., Risku, J., Impiö, J., Sorvisto, A., Abrahamsson, P.: Software startup education: gamifying growth hacking. In IWSiB 2019 Proceedings of the 2nd ACM SIGSOFT International Workshop on Software-Intensive Business: Start-ups, Platforms, and Ecosystems, pp. 25-30, Tallinn, Estonia, August 26 (2019). <https://doi.org/10.1145/3340481.3342734>

ware startups are keenly studied by academics [19]. Though marketing is a long-standing area of research in economic disciplines, and search engine optimization (SEO) and other areas of research closely related to growth hacking have been extensively studied in the field of information technology, growth hacking has not been directly studied academically.

Indeed, one of the goals of the original version of this paper was to spark interest in growth hacking in the academia, while also presenting two board games for teaching growth hacking. In this chapter, **we present those two board games for teaching growth hacking**. These games can help those involved in teaching startup entrepreneurship, as well as aspiring startuppers. The games can be downloaded using the links provided at the end of this chapter.

2 What is Growth Hacking?

The construct growth hacking was popularized by Sean Ellis [9] in his blog about startup marketing². Growth hacking is a marketing strategy according to Herttua et al. [11]. As the name implies, it is about using various growth hacking techniques or practices to “hack” the growth of a company, often a startup. To this end, we consider growth hacking *a process of rapid experimentation across marketing funnel, sales segments and other areas of the business including the product development, to identify the most efficient ways to grow a business*.

In practice, growth hacking is technology-oriented and relies on using technical practices, with one of the main tasks of a so-called growth hacker in fact being (software) development [11]. This, Herttua et al. [11] underline, is one of the main differences between growth hacking and other marketing strategies such as viral marketing or guerilla marketing.

In academic literature thus far, the following characteristics have been associated with growth hacking [9, 11]:

- Use of data in the form of metrics
- Changing the service based on data
- Low cost practices
- “Pulling” users to the service as opposed to
- “pushing” the service to them
- Using existing platforms in creative ways
- A/B testing

Growth hacking is typically discussed by focusing on various growth hacking techniques often referred to as growth hacks ([10, 16-17]). Growth hacking techniques are numerous (see e.g. [10]). They range from social media practices such as following individuals or organizations in hopes of gaining followers in return, to sales-related practices such as offering free software trials or downselling upon subscription cancellation. These practices are seldom exclusive and can be combined and experimented with at will by software startups.

² www.startup-marketing.com

A famous example of growth hacking in practice is the story of Hotmail. To tackle their growth issues early on, Hotmail implemented the signature text “PS. I Love You. Get your free e-mail at Hotmail” into all e-mails sent from their service. Having tried various other forms of marketing, this proved to be far more effective. Following the campaign, Hotmail quickly grew from a few thousand to a few million users and sold its service to Microsoft. In this fashion, growth hackers aim to “hack” growth by both being creative with existing platforms and using low cost practices to drive growth.

3 Two Board Games for Learning or Teaching the Basics of Growth Hacking

In order to teach growth hacking in a fun and engaging way, we have developed two board games focused on growth hacking and various growth hacking techniques recommended by practitioners (references [1-8, 10, 12, 15-18, 20-21]). Aside from providing an overview of the categories of growth hacking techniques, the board games also offer practical examples of the use of individual growth hacking practices. Both of the games can be downloaded from FigShare, the link to which is in the final section.

One of the board games, the Growthopoly, focuses on teaching different types of growth hacking (e.g. social media marketing), taking on an overview approach. The second game, Game of Growth, then focuses on individual growth hacking techniques. The contents of the two games thus complement each other. Both games are available on FigShare via the following link: <http://bit.ly/gh-board-games>

3.1 Growthopoly

Growthopoly (Fig. 1) is a Monopoly-inspired board game on growth hacking. In Growthopoly, the players compete against each other with the objective of gaining 5000 followers, and the player to reach that milestone first is the winner.

At the beginning of the game, each player: (1) Chooses a player character, (2) Chooses an additional marker, in addition to their game character, for displaying the number of followers in the middle of the board; and (3) Receives a certain amount of game money. Money is expended (and gained) over the course of the game by landing in the various squares on the game board.

The player character is used as a game marker for moving on the board according to the die rolls (and other events). Each player character specializes in one of eight areas of specialty in growth hacking: (1) Search Engine Optimization, (2) Email Marketing, (3) Social Media Marketing, (4) Public Relations, (5) Product Development, (6) Display Advertising, (7) Content Marketing, and (8) Search Engine Marketing. Learning different growth hacking strategies is a central part of the game, akin to purchasing properties in monopoly, and these specialties help the character learn certain strategies faster.

The game then proceeds in turns, one player at a time. During their turn, the player throws two dice and advances the number of spaces denoted by the dice with their game character. What happens then depends on which type of space the player lands on.

Sometimes the player has to act, while sometimes they can choose (not) to act. The game board contains six types of spaces:

- *Growth hacking skill space.* Whenever a player lands on a growth hacking skill space, the player may pay game money to study that skill for a number of turns: one turn for level one, two for level two, and three for level three skills. When the player has learned the skill, they gain the number of followers on the space.
- *Bonus space.* Upon arriving in a bonus space, the player draws a bonus card. Bonus cards are always positive and grant either money, followers, or both.
- *Trade fair space.* In this space, the player may pay a certain sum of money to gain a number of followers.
- *Problem & Solution (prob & solve) space.* The player draws a card, which may be either a problem or a solution. Solution cards are used to tackle problems and may be stored for later use, while problems cause immediate, negative effects when drawn unless countered with a solution. Players may trade solutions.
- *The Slush space.* The player spends a maximum of three turns at Slush. At the start of each turn, the player rolls a die to determine whether they stay or leave Slush.
- *The Start space.* Upon arriving in (or simply passing by) the start space after looping around the game board once, the player gains customers and game money.

By learning the different growth hacking techniques for their characters and by landing on the various spaces, players can gain more followers and/or more money. If a player lands on a growth hacking skill already learned (owned) by another player, the owner gains the number of followers listed on the space. If the player lands on the growth hacking skill that is also their player character's specialty, they get twice the number of followers and learning the skill takes one turn less than specified on the space. The game proceeds until one of the players reaches the goal of 5000 followers.

Growthopoly is intended to serve as a general introduction to growth hacking. It teaches the players about various types of growth hacking (e.g. Search Engine Optimization). It does not contain much educative content as far as micro-level growth hacking techniques go, however. The other game, which we present next, on the other hand focuses specifically on individual growth hacking techniques.



Fig. 1. The Growthopoly Game Board

3.2 The Game of Growth

The Game of Growth (Fig. 2) is a cooperative board game. In the Game of Growth, the players form a team that is intended to emulate a startup organization. Rather than competing against each other, the team then aims to win the game together as a team while playing against the game board. The goal is to get 5000 followers for the team's hypothetical software service.

Before the game starts, the players choose what type of startup they want to be: tech, service, or entertainment. The team then starts the game with 5000 dollars in (game) money. Using the 5000 dollars, the players have 10 turns to reach 5000 followers. Each turn represents one week. Each turn has three phases, each of which is denoted by drawing a different type of card.

(1) First, at the start of the turn, the team draws an event card. The event card applies special rules for that turn. For example, the event card might have a beneficial effect such as making hiring a new employee during that turn cheaper, or a negative one.

(2) Secondly, after the event card is drawn, the team draws three hack cards. Hack cards contain ways to increase the number of followers of the service. For example, a hack card may require the team to pay a few hundred dollars for a chance to gain a few hundred followers by rolling the die favorably. The team may either use or ignore the hack cards, but they are all discarded at the end of the turn either way.

(3) Finally, at the end of the turn, the team reveals an employee card at the end of the turn. The team then either hires or refuses to hire the employee, concluding the turn. Any employees hired by the team will have to be paid a salary at the start of each turn until the end of the game, or until fired. The employees offer various ways for the team to gain more followers.

The game then continues in this fashion until the team either wins or loses. The game automatically concludes after ten turns have passed, at which point the team loses if they have not reached the 5000 follower milestone. Otherwise, the team either loses by running out of money on the way or gains 5000 followers before the time limit is reached.



Fig. 2. Students Playing the Game of Growth

The educational value of the game is mainly in the hack cards. Each hack card contains descriptions of individual growth hacks. The cards cover techniques such as asking internet celebrities to promote your service or sending personalized emails to targeted prospects (“cold emailing”) as a very early-stage startup looking to gain its first users or customers. The Game of Growth, in other words, takes on a more micro-level approach to teaching growth hacking whereas Growthopoly focused on the big picture.

4 Methodology: How the Board Games Were Designed

The board games presented in this chapter were created during the course “TJTS5792 Advanced Lean Startups” in the University of Jyväskylä. The games were developed by two teams of Information Systems (IS) students, under the supervision of the teaching staff of the course. For creating the board games, we conducted a multi-vocal literature review on growth hacking prior to the start of the course.

The board games were based on the contents of various books written by startup experts, which we discovered by means of a multi-vocal literature review (that is, a literature review that included both peer-reviewed academic literature and unreviewed “gray” literature such as books by practitioner experts). Due to the lack of academic research on growth hacking, we focused on gray literature. Moreover, we limited the literature reviewed to books. As this was part of a university course, we wished to provide the students with clear reading materials.

The results were filtered based on the context “growth hacking” was discussed in the books, using researcher judgment. The focus was on confirming that the book discussed growth hacking themes (user acquisition by means that could be considered growth hacking). After confirming relevance, we performed quality appraisal by checking the reviews of each book on either Good Reads or Amazon Reviews. Only books rated 3.5 or higher (on a scale of 0 to 5) were included into the reading materials.

The books were then read by the students during the first week of the aforementioned course, one per student. Afterwards, the students presented the contents of their book to the other students in the course during the following lecture. After this, the students split into two teams, each tasked with creating a board game they felt taught the most important things about growth hacking, based on the readings. The creation process was supervised by the course staff who provided assistance when (if) needed.

Once the games were completed, the course participants and the teaching staff played both games during the third lecture. Though the games were not formally evaluated, the game session was considered enjoyable by the participants. The games were revised and further improved based on the feedback from the session. Afterwards, the students utilized the content of the games (the categories of growth hacking from the growthopoly, as well as any techniques from the Game of Growth where applicable) to split into groups and utilize growth hacking techniques from that category to

Using student created content in this fashion is not a novel discourse in the field of scientific education. It has increased in the recent years due to Wiki-technologies [22]. Moreover, our recent empirical, scientifically reported experiences from student created board games in SE education have also been positive [13].

5 Conclusions: Managerial Implications

Growth is vital for startups and marketing is key in achieving it. Growth hacking is a type of digital marketing that focuses on innovative, low cost practices, and is generally discussed primarily in relation to startups. Little academic research into growth hacking currently exists, although marketing in general and fields such as Search Engine Optimization closely related to growth hacking have been extensively studied in the past. We therefore presented two board games for teaching growth hacking.

The two board games presented in this chapter should primarily be of interest to those who teach startup entrepreneurship or work in startup ecosystems, as well as new startupper. The games serve as an introduction into growth hacking. However, for those seeking to learn more about growth hacking techniques, we recommend the books used as source material for these games (references 1-8, 10, 12, 15-18, and 20-21).

For educators, we also underline the educational value of having had the students utilize the growth hacking practices in a real setting. Based on our experiences, utilizing growth hacking techniques in practice resulted in lessons learned not covered in the books. For example, during a course on growth hacking, students who used growth hacking learned that: (1) if the platform sells display advertising by view count, views by bots also eat up the count. (2) Therefore, limiting ads to certain geographic locations

can help not only to reach the right audience, but also to avoid bots. (3) When advertising e.g. a YouTube channel, it can be beneficial to have the traffic pass through a re-direct link in order to collect more data about the incoming traffic.

Key Take-aways

- ✓ Game of Growth can be useful for teaching (or learning about) growth hacking techniques
- ✓ Growthopoly can be useful for teaching (or learning about) growth hacking strategies
- ✓ Both games can be downloaded from:
<http://bit.ly/gh-board-games>

References

1. Berger, J.: *Contagious - Why Things Catch On*. Simon & Schuster (2013).
2. Berger, J.: *How Ideas Spread*. The Teaching Company (2014).
3. Berger, J.: *The Hidden Forces that Shape Behavior*. Simon & Schuster. (2016)
4. Covell, S.: *Marketing Your Startup - The Inc. Guide to Getting Customers, Gaining Traction, and Growing Your Business*. AMACOM (2018).
5. Ellis, S., Brown, M.: *Hacking Growth: How Today's Fastest-Growing Companies Drive Breakout Success*, Crown Business (2017).
6. Eyal, N., Hoover, R. *Hooked - How to Build Habit-Forming Products*. (2014)
7. Fong, R., Riddersen, C.: *Growth Hacking: Silicon Valley's Best Kept Secret*. Lioncrest Publishing (2017).
8. Fried, J., Heinemeier-Hansson, D.: *Rework*. Crown Business (2010).
9. Geru, M., Rusu, E., Capatina, A.: Growth hacking practices in a start-up: a case study on thecon.ro. In *Proceedings of the 2014 International Conference on Risk in Contemporary Economy* (2014).
10. Happy, A.: *How I create Growth Hacking Plans for startups for \$10,000: + TOP 300 growth hacks you can put into practice right away*. CreateSpace Independent Publishing Platform (2016).
11. Herttua, T., Jakob, E., Nave, S., Gupta, R., Zylka, M.P.: Growth Hacking: Exploring the Meaning of an Internet-Born Digital Marketing Buzzword. *Designing Networks for Innovation and Improvisation*, pp. 151-161 (2016).
12. Holiday, R.: *Growth Hacker Marketing - A Primer on the Future of PR, Marketing and Advertising*. Portfolio (2013).
13. Kemell, K.K., Risku, J., Evensen, A., Abrahamsson, P., Dahl, A.M., Grytten, L.H., Jedryszek, A., Rostrup P., Nguyen-Duc, A.: Gamifying the Escape from the Engineering Method Prison - An Innovative Board Game to Teach the Essence Theory to Future Project Managers and Software Engineers. In *Proceedings of the 2018 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*. DOI: [dx.doi.org/10.1109/ICE.2018.8436340](https://doi.org/10.1109/ICE.2018.8436340). (2018).
14. Kemell, K.K., Wang, X., Ngueyn-Duc, A., Grendus, J., Tuunanen, T., Abrahamsson, P.: 100+ Metrics for Software Startups - A Multi-Vocal Literature Review. In *proceedings of*

- the 1st Software-intensive Business Workshop on Start-ups, Platforms and Ecosystems (SiBW 2018), Espoo, December 3rd, 2018. (2018).
15. Linkner, J.: Hacking Innovation. The New Growth Model from the Sinister World of Hackers. Fastpencil Publishing (2017).
 16. Patel, S., Wormley, R.: 100 Days of Growth Book - 100 Actionable Tips to Grow Your Startup Faster. E-Book.
 17. Peters, R.: Growth Hacking Techniques, Disruptive Technology - How 40 Companies Made It BIG - Online Growth Hacker Marketing Strategy, Blep Publishing, (2014).
 18. Snow, S.: Smartcuts - How Hackers, Innovators, and Icons Accelerate Success. Harper-Business (2014).
 19. Unterkalmsteiner, M. et al.: Software Startups – A Research Agenda. e-Informatica Software Engineering Journal, 10(1), 89-123, (2016).
 20. Walsh, R.: The Web Startup Success Guide. Apress (2009).
 21. Weinberg, W., Mares, J.: Traction - a Startup Guide to Getting Customers. S-curves Publishing (2014).
 22. Wheeler, S., Yeomans, P., Wheeler, D.: The good, the bad, and the wiki: Evaluating student-generated content for collaborative learning. British journal of educational technology, 39(6), 987-995 (2008).