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BUSINESS MODELS IN STARTUP GROWTH FORECASTING

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ABSTRACT

A start-up is the IT industry specific form of commercial enterprise with its own peculiarities not observed in other forms of business ventures. Hands-on purposes require a toolset for start-up growth modelling and forecasting as well as for their evaluation; business models belong to such tools. Advantages of business modelling is not always obvious to start-up founders, up to the moment when it becomes a part of requirements from investors. A form that allows quick modelling greatly simplifies evaluation and triage of start-ups by investors and thus can become one of formatting factors for regional or national start-up ecosystems in Ukraine. Based on the recent publications this research offers an example of a business model and suggests several key aspects for more practical application of business modelling for the sake of start-up growth forecasting, including expression of main milestones in the financial projection.

Keywords*: start-up, innovations, business model, business plan, investment, ecosystem.*

INTRODUCTION

The term "start-up" is usually used in the context of innovations in software development, sometimes also including a certain amount of hardware production, and is applied to a newly established venture in its early stages. Start-ups focus on offering a new solution to an existing problem or on creating a totally new demand. From the customer perspective they address either individual customers (B2C) or other businesses (B2B) or individual customers of another service provider (B2B2C). Although purely software start-ups call their solutions "products" and this term gained wide adoption in the industry those products are services while hardware solutions are closer to the classic understanding of a product. The inventor of the word "start-up" is unknown, the very first track of usage of this word dates to the 1970s. It was popularised by various conferences and other events to finally become a widely recognizable lexeme in different languages. The main difference of a start-up from a "traditional" business venture finds its grounds in the innovativeness of the offered solution that is why uncertainty is the key differentiator with every stage requiring validation, from the feasibility studies to creation of a minimal viable product (MVP), its route to market and further upscaling. If in "traditional" business the question covers "know how" someone else has already done it and the aim of the enterprise is to reproduce the same results in a new location or with higher efficiency, start-ups must deal with discovery of implementation possibility and costs. The said puts start-ups into the high-risk enterprise category, but since the early days of "garage" start-ups the high-tech industry has developed a complex of approaches, methods and instruments for start-up growth which collectively can be addressed as an ecosystem.

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In the pre-start-up epoch inventions appeared as the fruit of scientific work under the umbrella of research centres of universities or big industrial corporations due to the high cost of computation equipment, limited access to it and the “analogue” nature of the devices we used. In the early years of post-industrial economy, with the Internet becoming more ubiquitous and personal computers affordable, development and route to market of purely software solutions could no longer be a privilege of the few research centres, so we witnessed emergence of unimaginable earlier computer programs created by small companies (early 2000s). Some of those companies and programs soon became forgotten. Others revolutionised the industry, for example, Skype, a small Estonian company back then, created a solution for free Internet calls, later this company was acquired by Microsoft and once a profitable market of expensive international phone calls got almost fully replaced with a new demand for countless solutions for free voice and video calls. Then computers decreased in size transforming into early smartphones opening a new opportunity for more start-ups with more innovative ideas (2000 – 2010). After that the main manufacturers of mobile phones introduced so-called application markets for their platforms effectively forcing software developers to use these markets as the only possible distribution options for their solutions. Over time Google’s and Apple’s restrictions to access programmatically device components and sensors (e.g. location services) became quite strict. Today software developers are constrained with highly regulated legal implementation options and tightly defined technical features of the low level (operating system) capabilities; thus, innovations are once again in the history of humanity streamlined – if not controlled – by the industry giants and corporations. In this research the author elaborates on some pragmatic aspects of such limitations from the economic perspective.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS, PROBLEM STATEMENT

The term “business model” is widely used in scientific and popular business literature and is commonly understood as a theoretical construct that represents a specific way of customer acquisition and revenue generation [1, 2]. In practical application a business model is required by investors and expected as a part of the pitch deck, ideally in the form of an excel spreadsheet with formulas allowing to modify input parameters and see the output results. This is where a shift from “static” business plan documents to more dynamic modelling is clearly observed. Business models should help to understand the revenue generation plan, be aligned with well-defined short term-objectives and strategic long-term goals and the company's mission, at the same time remaining flexible to adapt to changes [3].

The industry knows a few cases of very successful internet companies which achieved significant growth and global adoption without any precise economic plan, the most famous one is Twitter. The idea of the founders was as “simple” as accumulating a huge number of users (not to be confused with customers!) and figuring out monetization later. Eventually Twitter's leadership team decided to sell advertisements and offer premium services to their users on a subscription basis [4].

In the light of the customer lifecycle the key metrics include the customer acquisition cost and the lifetime value of a customer [5]. On the other side of the scale unit economics shall be estimated assuming the worst possible parameters and including all liabilities. As the result of an accurate reflection of the above-mentioned factors a start-up business model shall provide a clear view on the profitability and allow to run simulations and thus enable evaluation firstly for the founders and then for potential investors. A frequent mistake of technical founders lies in their failure to assess and evaluate their idea from the economic perspective, so their innovative and technically doable project makes no sense moneywise [6].

Lean start-up is believed to be one of the most efficient growth methodology, it uses a different compared to traditional businesses approach based on assumptions or vision of the founders and rapid testing of such assumptions. “While existing firms execute a business model, start-ups look for one” – this translates into a series of small iterations in development of different features of a software solution, each of them has to be promptly validated through MVP tests involving real users. Assumptions are validated, the use of scarce resources is optimised and building a product that no one is ready to pay for is avoided. The other problem is related to the lack of commonly acceptable definition of success. While investors basically expect to see some level of market traction, start-up and investor communities all over the world do not share any precise understanding of what would suffice as such market traction to clearly categorise ventures according to risks vs. profitability; the lack of any unification does not help to scale the process of triaging start-ups for investment purposes raising the same challenge of evaluating each new start-up [7].

In recent years the gap between business model theory and its hands-on usage by entrepreneurs has been closing: founders tend to convert their abstract vision into pragmatic rules guided by business models to help them in making more accurate decisions under uncertainty, in task prioritising and resource management [8, 9]. A true breakthrough is owed to a wide range of tools for automation of user data collection

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and analysis often referred to as data driven business model development, once affordable for big corporations but now open to a broader audience. Moreover, for a start-up to fully benefit from user data analysis and corresponding business insights the process of data collection should be planned for and implemented at early stages [10]. Numerous business intelligence tools are available to entrepreneurs and scholars for free or for a quite affordable fee so working with user data has become a comparatively easy exercise leaving no excuses to omit it from start-up development routines [11, 12, 13]. Despite a strong temptation to utilise Artificial Intelligence in business modelling we should not rely blindly on any answers or conclusions provided by AI but rather consider them as probability-based predictions in need of validation [14].

Attempting to create innovative solutions, digital entrepreneurs often count upon such resources as open data or free services although access to them is not guaranteed and can become unavailable at any moment [15]. This should not be skipped from the start-up data model because growth or even existence of the start-up depends greatly on 3rd-parties whose terms of service can change unexpectedly [16, 17].

Given noteworthy rise of blockchain start-ups, the author searched for mentors' guidance on business modelling for companies in this industry supported with some feedback from investors, below are the key focus items well valid for ventures in other industries:

1. Identifying revenue streams such as transaction or subscription fees, advertising revenue, referral schemes.
2. Estimating potential income.
3. Categorising costs as fixed or variable.
4. Calculating net income through subtracting expenses from revenue.
5. Analysing the burn rate to check financial health and know the point in time when the business runs out of money.
6. Evaluating the start-up's runway as the indication of time left to achieve profitability supposing no new funding is available.
7. 3-year financial projections including assumptions about revenue and expense growth.
8. Improving accuracy of the business model through use of realistic assumptions backed by metrics.

Common errors include misunderstanding the technology, neglecting regulatory requirements, expecting too high user adoption too quickly [18, 19].

The problem: on the one hand modern start-ups face various challenges in their attempts to evaluate the time, resources and costs needed to create and take to the market something previously unknown and establish a steady demand for it. On the other hand, they benefit from the existing ecosystem but at the same time remain somewhat constrained. Start-ups work against the clock trying to accomplish their goals before they run out of funds in highly volatile environments. Often access to funding is a bigger problem than proving solution feasibility. Sometimes innovative products or services belong to an area where legislation still has to catch up with the technology, (e.g. cryptocurrencies). Areas like defence or healthcare make field tests hard. Global nature of the Internet provides an opportunity to address potential customers regardless of their physical location or nationality, albeit this gain comes with the pain of imposing the same requirements on industry giants and tiny new companies, e.g. data protection regulations. No matter what solution a start-up works at, the competition would be huge, to say the least. This is a short scope of hurdles and risk factors start-ups must deal with, each of them is worth studying in the light of possibility to model and forecast a start-up growth for deeper understanding in general and for defining those specific issues for new Ukrainian tech companies in particular so that upcoming theoretical work on Start-up Ecosystem in Ukraine would find further elaboration. Standard approaches widely used for "traditional" businesses would not suffice for start-ups mostly because of numerous unknown conditions start-ups have to research in the process of their growth.

The aim of this research is to drill down the specifics of start-up development based on documented case studies and best practices articulated by investors and mentors, outline the key approaches for business modelling in start-ups and suggest a simplified example of a business model to illustrate how it can be used by entrepreneurs for self-control and planning, by investors for start-up evaluation and how it could become a tool for general adoption inside regional and national start-up ecosystem.

MATERIALS AND RESEARCH METHODS

Methods of this work included structural and comparative analysis and elements of computer modelling. Recent publications in scientific literature and on specialised online resources were studied with informational and analytical approaches.

RESULTS OF THE RESEARCH

In the past years research around the globe have been strongly advocating the advantages of business modelling in young and growing tech companies however a group of questions remain unclear. To begin with, let us bring into the spotlight a common habit to identify users of a software solution as customers of the company providing this solution. Obviously, users are the ones who interact with the service, create and consume content, generate traffic, leave certain

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digital footprints in the system, from simple browsing history to complex unique behaviouristic patterns. Users should be understood as a liability of the company because the business incurs costs of user acquisition and maintenance, for instance a paid ad to find a new user, cost of storing the user's content, cost of traffic the user generates, computation power needed to process the user's data, etc. Less obvious but nevertheless critically important for building an adequate business model is the transformation of users into customers, which happens only once they start paying for the service. Since users do not pay, the company must onboard other customers who will. In a social network, a user accesses the service for free and thus is not a customer, a paying advertiser is. Each of us is a user of free Gmail, Facebook, Twitter, or LinkedIn but only some of us are customers, those who pay for Google for Workspace, ads in Facebook, Twitter Blue or LinkedIn Premium. So, it is not enough for a start-up to design a business model based on growth of its free service user base, the plan to convert free users into paying customers should be in place which sets forth probably the main question for start-up surviving: what is the user to customer conversion rate? Business modelling together with lean start-up methodology can help in finding the answer otherwise entrepreneurs get stuck in guesstimating. Quick experiments to validate user adoption of each new small (MVP level) feature are to minimise risks of building something nobody would want; simulations of financial projections provide a helicopter view on the entire business operations.

Let us consider a somewhat simplified high-level vision of a start-up:

1. The MVP will be created in a 3-months term, it will offer sufficient functionality to start onboarding of both freemium and paying customers. Further research and development work will continue to enrich the solution with new features.
2. 3 developers are needed full time (back-end, Android, iOS), monthly salary for each of them is USD 3,000, it is verified, contracts with these developers are negotiated and secured.
3. Purchase of 3 PCs for the developers (3 * USD 1,500 = USD 4,500), the prices are verified.
4. Acquisition of freemium users and paying customers shall be outsourced to an agency who requests a fixed price per each registered user and offers theoretically unlimited number of them.
5. There will be some legal and accounting costs, the amounts are verified.
6. Monthly cost of user maintenance can be measured experimentally and calculated per user, so it can be considered as known.
7. Monthly customer fee shall be somewhat between USD 10 and 20. A higher rate will not compete with similar services provided by competitors; a smaller will make no sense.
8. The business must become profitable within its first year.

The number of both freemium users and paying customers is an open question, so is the aggressiveness of their onboarding. The amount of the monthly customer fee is not chosen. Without knowing the answers to these questions, it is impossible to prognose the spendings and earnings, which in its turn prevents from understanding how much money this start-up plans to raise. Obviously, due to the big number of unknowns, only multiple simulations can provide enough grounds for decisions.

First, unit economics should be understood and modelled (Table 1).

Table 1. Unit Economics

Parameter	One time	Daily	Monthly
A new freemium user acquisition, USD	2		
A new paying customer acquisition, USD	5		
Hosting and traffic per user, USD			0.075
Customer fee, USD			19.9
Engineer cost, USD		150	
Legal cost, USD			200
Accounting cost, USD			100

As it was mentioned above, the cost of customer acquisition, the cost of user hosting and traffic, the cost of accounting, legal and engineering resources, and customer free can be considered as known and presented as one-time fee or recurring monthly or daily fee depending on their nature. Each of these parameters in the model can be changed for the purpose of simulation of the financial projection. For the sake of simplicity in this work only the customer fee will be modified.

In the first simulated projection (Fig. 1) the customer fee is set to be expensive, USD 19.9, the process of freemium user acquisition is aggressive while the onboarding of paying customers is slow. The total number of users is as high as 75 thousand. In October the monthly sales outgrow the monthly spendings, which means that until that moment the accumulated spendings should be covered by the investment, hence the amount this start-up needs to raise is USD 181K. The business becomes profitable in December with the total budget of USD 310K. Although the annual net

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income is minimal, the last month shows the income equals USD 76K, assuming nothing changes, the business will generate this amount each subsequent month.

Metrics	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total*
Engineering mandays {input}	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	
Enginering cost, USD	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	
Legal and accounting, USD	300	300	300	300	300	300	300	300	300	300	300	300	
Device purchase, USD	4,500	0	0	0	0	0	0	0	0				
Increase of freemium users {input}	**0**	**0**	**0**	**1,000**	**3,000**	**5,000**	**10,000**	**10,000**	**10,000**	**10,000**	**10,000**	**10,000**	
Increase of paying customers {input}	**0**	**0**	**0**	**0**	**100**	**100**	**100**	**300**	**1,000**	**1,000**	**1,500**	**2,000**	
Cost of freemium user acquisitions, USD	0	0	0	2,000	6,000	10,000	20,000	20,000	20,000	20,000	20,000	20,000	
Cost of paying customer acquisition, USD	0	0	0	0	500	500	500	1,500	5,000	5,000	7,500	10,000	
Total paying customers	0	0	0	0	100	200	300	600	1,600	2,600	4,100	6,100	
Customer fee, USD	0	0	0	0	1,990	3,980	5,970	11,940	31,840	51,740	81,590	121,390	
Total users (freemeum + paying)	0	0	0	1,000	4,100	9,200	19,300	29,600	40,600	51,600	63,100	75,100	
Hosting and traffic, USD	0	0	0	75	307.5	690	1,448	2,220	3,045	3,870	4,733	5,633	
Monthly spendings, USD	13,800	9,300	9,300	11,375	15,608	19,990	31,248	33,020	37,345	38,170	41,533	44,933	305,620
Monthly sales, USD	0	0	0	0	1,990	3,980	5,970	11,940	31,840	51,740	81,590	121,390	310,440
Spendings so far, USD	13,800	23,100	32,400	43,775	59,383	79,373	110,620	143,640	180,985	219,155	260,688	305,620	
Sales so far, USD	0	0	0	0	1,990	5,970	11,940	23,880	55,720	107,460	189,050	310,440	

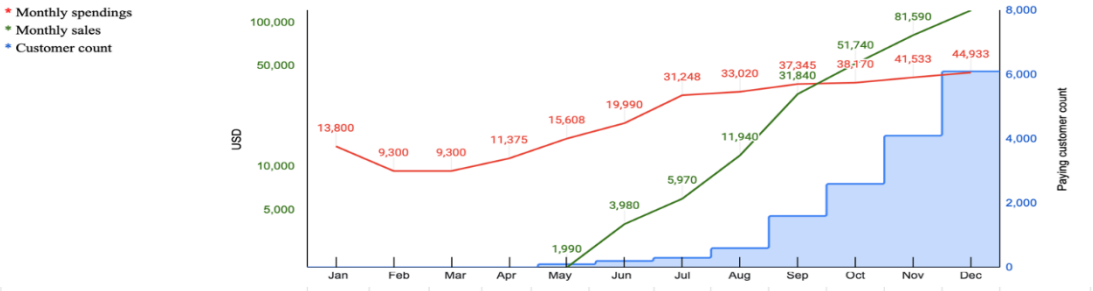

Fig. 1. An expensive fee, slow customers onboarding

The second simulated projection (Fig. 2) differs from the first one in a reduced customer fee, a smaller total user count, but most importantly, in a gradual reducing of the engineering resources. Similarly to the previous scenario, the profitability is achieved. The amount to raise is USD 136K, the annual budget is 248K, the income to be generated in December and each subsequent month is USD 59K.

Both scenarios were designed with the plan in mind to establish a big free user base with the intention to convert in the future free users into paying customer, which is an assumption that needs validation. A plan to reduce engineering efforts can be rather risky and will most likely be rejected by investors because keeping engineering effort on the level of 20 man-days per month does not address situations when this single engineer can become unavailable. Also planning for team reduction is not aligned with future expansion and upscaling. Another observation from these 2 scenarios refers to the budget for the whole project in the first year, raising a question of possibility to achieve project profitability with smaller investments.

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Metrics	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total*
Engineering mandays {input}	**60**	**60**	**60**	**60**	**50**	**40**	**20**	**20**	**20**	**20**	**20**	**20**	
Enginering cost, USD	9,000	9,000	9,000	9,000	7,500	6,000	3,000	3,000	3,000	3,000	3,000	3,000	
Legal and accounting, USD	300	300	300	300	300	300	300	300	300	300	300	300	
Device purchase, USD	4,500	0	0	0	0	0	0	0	0				
Increase of freemium users {input}	**0**	**0**	**0**	**1,000**	**1,000**	**2,000**	**5,000**	**10,000**	**10,000**	**10,000**	**10,000**	**10,000**	
Increase of paying customers {input}	**0**	**0**	**0**	**0**	**100**	**100**	**100**	**300**	**1,000**	**1,000**	**1,500**	**2,000**	
Cost of freemium user acquisitions, USD	0	0	0	2,000	2,000	4,000	10,000	20,000	20,000	20,000	20,000	20,000	
Cost of paying customer acquisition, USD	0	0	0	0	500	500	500	1,500	5,000	5,000	7,500	10,000	
Total paying customers	0	0	0	0	100	200	300	600	1,600	2,600	4,100	6,100	
Customer fee, USD	0	0	0	0	1,590	3,180	4,770	9,540	25,440	41,340	65,190	96,990	
Total users (freemeum + paying)	0	0	0	1,000	2,100	4,200	9,300	19,600	30,600	41,600	53,100	65,100	
Hosting and traffic, USD	0	0	0	75	157.5	315	698	1,470	2,295	3,120	3,983	4,883	
Monthly spendings, USD	13,800	9,300	9,300	11,375	9,958	10,615	14,498	26,270	30,595	31,420	34,783	38,183	240,095
Monthly sales, USD	0	0	0	0	1,590	3,180	4,770	9,540	25,440	41,340	65,190	96,990	248,040
Spendings so far, USD	13,800	23,100	32,400	43,775	53,733	64,348	78,845	105,115	135,710	167,130	201,913	240,095	
Sales so far, USD	0	0	0	0	1,590	4,770	9,540	19,080	44,520	85,860	151,050	248,040	

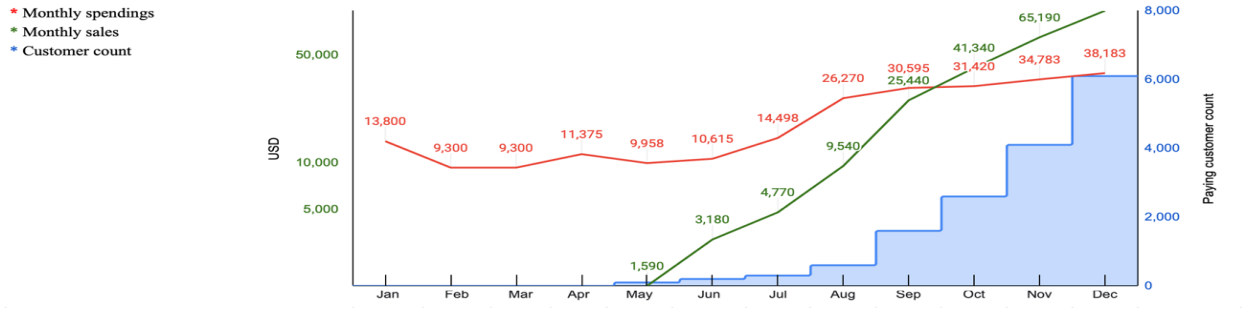

Fig. 2. Reducing engineering resources, slow onboarding

Fig. 3 shows a projection with a considerably lower budget achievable though skipping freemium user acquisition and focussing on paying customers only. In this case the start-up seeks to raise only USD 71 K.

Metrics	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Total*
Engineering mandays {input}	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	
Enginering cost, USD	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	
Legal and accounting, USD	300	300	300	300	300	300	300	300	300	300	300	300	
Device purchase, USD	4,500	0	0	0	0	0	0	0	0				
Increase of freemium users {input}	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
Increase of paying customers {input}	**0**	**0**	**0**	**0**	**100**	**100**	**300**	**500**	**500**	**500**	**500**	**500**	
Cost of freemium user acquisitions, USD	0	0	0	0	0	0	0	0	0	0	0	0	
Cost of paying customer acquisition, USD	0	0	0	0	500	500	1,500	2,500	2,500	2,500	2,500	2,500	
Total paying customers	0	0	0	0	100	200	500	1,000	1,500	2,000	2,500	3,000	
Customer fee, USD	0	0	0	0	1,590	3,180	7,950	15,900	23,850	31,800	39,750	47,700	
Total users (freemeum + paying)	0	0	0	0	100	200	500	1,000	1,500	2,000	2,500	3,000	
Hosting and traffic, USD	0	0	0	0	7.5	15	38	75	113	150	188	225	
Monthly spendings, USD	13,800	9,300	9,300	9,300	9,308	9,315	10,838	11,875	11,913	11,950	11,988	12,025	130,910
Monthly sales, USD	0	0	0	0	1,590	3,180	7,950	15,900	23,850	31,800	39,750	47,700	171,720
Spendings so far, USD	13,800	23,100	32,400	41,700	51,008	60,323	71,160	83,035	94,948	106,898	118,885	130,910	
Sales so far, USD	0	0	0	0	1,590	4,770	12,720	28,620	52,470	84,270	124,020	171,720	

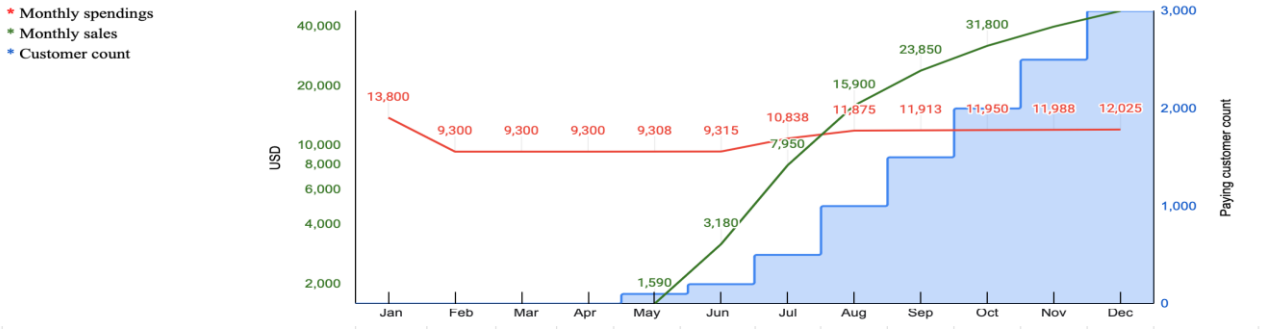

Fig. 3. A lower budget, no freemium users

Experimenting with variable values of the input parameters of this simplified model gives us unlimited number of scenarios, more or less aggressive, cheap and expensive, with different levels and types of risks.

Now let us bring the above business model closer to reality and introduce an extra layer of complexity associated with processing of customer payments. From the perspective of payment frequency, economics of a start-up can be subscription or transaction based. Surely, any business would prefer to bind their customers with long-term obligations in the form of automatically renewed subscriptions which makes sense in content access solutions (e.g. Netflix).

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Transaction fees work better with solutions where the number of said transactions per customer is unpredictable, the commission (transaction fee) depends on the cost of transaction and where such approach is traditionally justified (e.g. crypto payments). Regarding customers' money access a start-up has the following choice of options and each of them is characterised by the value of commission, cost of implementation and maintenance, options to finally withdraw the funds to the start-up's account:

- Old-fashioned wire transfer. It is applicable in B2B and not very popular. The only advantage is that the money is directly deposited to the company's bank account.
- Payment card processing. Heavily regulated thus start-ups prefer to work via a 3rd party who specialises in processing card payments (e.g. Stripe, PayPal), and only industry giants implement their own direct processing of payments.
- Local payment solutions (in Ukraine Privat24, in Kenya Mpesa and so on). The downside of this method is low scalability. A solution for Ukraine will not work in Germany and for a start-up to go global this needs to be redone.
- Payment through the application market (Google Play, App Store), the one and only legal solution for many mobile applications, especially when the payment is for a virtual service. This is one of the earlier mentioned constraints both Apple and Google put on the app developers.
- Payments in crypto currencies. Problematic from the legislative standpoint and depends on jurisdiction.
- Cash payments shall be mentioned as a very poor option existing only due to some local regulations (e.g. an option to pay cash to an Uber driver).

Our model says nothing about the location of the customers, so we assume they can be anywhere in the world therefore we need a universal payment solution. We know that our service is implemented in the form of a mobile application (the plan mentions Android and iOS developer) and correspondingly in-app purchases shall be processed by the billing systems of Google Play and App Store. In general, each of them takes 30% commission with the exceptions below:

1. Both Apple and Google offer a discounted fee of 15% if the business makes less than USD 1 million in annual net app revenue.
2. These revenue share rules only apply to digital goods and services excluding:

a. physical goods such as groceries, clothing, houseware, or electronics;

b. physical services such as bus or train tickets, gym memberships, food delivery, cinema tickets, hotel booking;

c. payment of a credit card or utility bill.

Another risk factor should be included into the business model though it is not always clear how to quantify it: reliance on 3rd-party services (APIs). For example if the start-up product offers navigation from point A to point B as its key feature meaning that without it the product does not exist, from the engineering perspective this can be achieved with Google Maps as well as Apple MapKit and also some other data providers (OpenStreetMap, etc), the fee varies and usually depends on the volume and chosen technology, in any case the cost can be calculated based on predicted usage and the choice of provider. If the product is actually nothing more but an add-on on top of a 3rd-party service, for instance, a solution for certain automation in calculating YouTube video ratings and showing only the relevant videos to the users based on their interests and location, apparently, this functionality fully depends on YouTube API. If at any moment in time YouTube decides to modify their API additional work shall be required to keep up with the changes, if YouTube stops serving through their APIs such critical for this solution information as video ratings the whole solution becomes absolutely blocked, no remedy is possible even theoretically because the entire business is built on one only irreplaceable 3rd-party component. Such risks are often underestimated by start-up founders while investors identify them easily through preliminary due diligence questionnaires. Such risk factors should be treated as "0 multipliers" in the business model as they can override all and any other terms.

Regarding the planning horizon: for illustration purposes the suggested above business model covers 12 months only. In reality securing a seed funding round can take a few months with following rounds requiring much more time from the moment of request submitting to receiving money into the bank account. With this in mind, a proper business planning and modelling should be done for 3 years with these milestones indicated in the financial projection:

1. Completion of MVP.
2. Start and end of each round of customer acquisition.
3. Each significant product release.
4. Monthly sales reach the level of monthly spendings (profitability).
5. Net profit reaches the level of the total cost of investment (ROI).

From the ecosystem perspective, business modelling – particularly if designed and structured according to common principles and requirements for a given region or country – can become a powerful tool for both entrepreneurs and investors, serving the role of shaping start-ups as qualified for funding and capable of rapid growth. Such common

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requirements are not to be expected to emerge from legislation or regulations but rather become a result of educational work provided via regional and national start-up hubs and backed by initiatives for support of innovative entrepreneurship on the national level. In this educational effort a significant place naturally belongs to universities and colleges which can contribute their strong scientific potential, whose today's students will form tomorrow's community of new entrepreneurs and workforce.

CONCLUSIONS

Spreading awareness of the advantages of business modelling alongside pragmatic advice and guidance for start-up founders is needed in order to increase effectiveness of start-ups. This activity can be offered through joint efforts of academic institutions and start-up hubs under regional and national initiatives for support of innovative businesses and can contribute to development of start-up ecosystems.

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БІЗНЕС МОДЕЛІ В ПРОГНОЗУВАННІ РОЗВИТКУ СТАРТАПІВ

Байтельман Я. Л.

Стартап є специфічною для IT-галузі формою функціонування комерційного підприємства із певними власними особливостями, не притаманними іншим формам бізнесів. Практичні цілі диктують потреби в інструментарії для моделювання і прогнозування розвитку, а також оцінювання потенціалу стартапів; бізнес моделі належать до таких інструментів. Переваги бізнес моделювання не завжди є очевидними для засновників стартапів, аж доки бізнес модель не стає частиною вимог з боку інвесторів. Формат, що дозволяє швидке моделювання, суттєво полегшує оцінювання і відбір стартапів інвесторами і таким чином може бути одним з чинників формування регіональної та національної стартап-екосистеми в Україні. На основі новітніх публікацій пропонується приклад бізнес моделі і наводиться ряд ключових аспектів прикладного застосування бізнес моделювання з метою прогнозування розвитку стартапу, включаючи відображення основних вік

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розвитку та факторів ризику у формі фінансової проекції.

Ключові слова: *стартап, інновації, бізнес модель, бізнес план, інвестування, екосистема, фінансова проекція.*

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