# GROWTH PERSPECTIVES OF IMMERSIVE TECHNOLOGY MARKET IN UKRAINE

by

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A thesis submitted in partial fulfillment of the requirements for the degree of

MA in Business and Financial Economics

Kyiv School of Economics

2020

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### Acknowledgments

The author wishes to show the huge perspectives of the ukrainian ImT market to potential investors, clients, government and the analyzed Advin Company itself – one of the largest AR/VR companies in Ukraine operating on the domestic market. The research demonstrates all the business benefits from using the technology.

From the analysis of 2019 projects of Advin company it follows that new revenue streams of Ukrainian AR/VR companies can be created from content production, including graphics, video content, etc. and company-owned applications, usage of which is charged.

There are several reasons why immersive technologies have great perspectives in so many industries. Some of them are automotive, engineering, manufacturing, construction, retail, defense, and education industries, which alone account for more than 80% of the workforce. This innovation can be easily used and scaled by both customers and sellers. Additionally, adopting ImT allows for quickly changing types of content and customer experience, moving closer to the state of mass adoption.

Overall currently ImT in Ukraine demanded by advertisement, FMCG, mass events, and exhibitions. Meanwhile globally the trend is different – demand from healthcare, education, and training. That's why it can be anticipated that in future those trends will catch up with Ukraine. From the customer side, Ukrainian technology providers create demand not only for domestic companies but also for foreign ones, as the average pricing of each project is at least 6 times lower than on the global market.

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# LIST OF ABBREVIATIONS

- $\boldsymbol{AR}$  Augmented reality
- MR Mixed reality
- ImT Immersive technology
- TR Total revenue
- VR Virtual reality

### CHAPTER 1. INTRODUCTION

Nowadays immersive reality technologies are of increased interest not only in the entertainment industry, but also in many other fields such as industrials, medicine, and education. So that these technologies might not only be used for advertisement but also for accelerating the profitability and being applicable for non-profitable organizations as well. The topic is quite actual in the current pandemic crisis as it provides the communication alternatives and contributes to R&D on coronavirus treatment, allowing health workers the ability to better visualize the impact of COVID-19 on patients' lungs.

Immersive technology is an umbrella term for three basic types of technology: virtual reality, augmented reality, and mixed reality. The main difference between those lays in the interconnection of a digital environment with the real world. To be more precise, in a virtual reality (VR) digital environment shuts out the real world. Augmented reality (AR) expands our physical world, adding layers of digital content on top of it. Mixed reality (MR) is an environment where both digital and real objects coexist and interact with one another.

ImT appeared back in the 1960s when the first VR/AR head-mounted display (Sword of Damocles) was invented. But nowadays it becomes very actual because of two basic reasons: the richer business benefits and technological advances, which create an enhanced user experience. There are various business benefits of VR/AR. Major of them are employee training, testing of procedures, organizing virtual events, product promotion, creation of new revenue streams and grow existing ones. Besides that, it allows the client company to position itself as innovative and forward-thinking within its industry. That in turn helps to attract new investors, business partners, or employees. Regarding technological advances nowadays hardware and software evolve extremely fast, becoming more engaging and sophisticated. For example, headsets became more comfortable, lighter, and less expensive, 4G-5G network benefits ImT through minimizing latency and delivering smooth and rich customer experience.

In modern times, the global market leaders — Ford, Boeing, Mercedes, Walmart, Jaguar, Huawei, and Haier —improvement of existing computer technologies design, product testing, visualization of prototype technology components.

AR/VR has wide application and can significantly penetrate our lives in the future.

	Consumer	Enterprise		
Gamin g	<b>Pokémon Go</b> : Successful game adds >\$7B to Nintendo's market value	Logistic s	<b>DHL</b> : 25% operational efficiency with Global AR Vision Picking program	
Video	<ul> <li>Baidu: Producing 10 VR films and 100 VR games within next year</li> <li>Nokia OZO: UEFA Euro 2016 soccer games filmed in 3D VR</li> </ul>	Enginee ring	Ford: Immersive Vehicle Environment used to verify detail on virtual prototypes	
Entert ainme nt	<b>The Void:</b> Hyper-reality experience tickets sold for 5x movie theatre prices	Office producti vity	<b>Microsoft</b> : Launching Office applications for Hololens	

Table 1. AR/VR technology applications

# RetailAlibaba: Launching VR retail<br/>stores with avatars by end of 2016Healthc<br/>areDuke University:<br/>Research uses VR to help<br/>paraplegics regain leg<br/>functionAudi: Live VR tool allows<br/>customers to customize and test<br/>carsinterest of the store of the s

Source: CBI Insights, Trends in Augmented and Virtual Reality

The AR/VR market in Ukraine is currently in an emerging phase but still develops at a rapid pace. Appendix I illustrates the current market players of the investigated market. Nevertheless, it has some limitations, which are related to a fear of innovations of potential clients within Ukraine. From the other perspective purchasing power of domestic companies is significantly lower compared with international giants. That's why Ukrainian ImT companies supply their products and services mainly to the foreign market. That is what opens attractive opportunities for new market entrants.

Another important feature of this market in Ukraine the full product itself from production to the allocation of content on digital platforms is developed by few market players, while most of them provide animation, graphics, or software only. From that follows the high price of the service, as there is a lack of qualified expertise.

### CHAPTER 2. INDUSTRY OVERVIEW AND RELATED STUDIES

According to the International Data Corporation, worldwide spending on AR and VR is expected to reach \$18.8 bln, while growing with CAGR of 77% from 2019 to 2023 from \$10.5 bln to \$103 bln respectively.

Figure 1. Worldwide spending on AR/VR, [USD, bln]



Source: International Data Corporation

According to Statista, the global AR/VR market capitalization is going to reach \$193 bln in 2022/ being \$20.1 bln in 2019.

Figure 2. Global AR/VR market capitalization, [USD, bln]



In 2020 this enormous growth will be mainly led by such commercial sectors as retail (\$1.5 bln) and discrete manufacturing (\$1.4 billion) along with investment services and banking, which are forecasted to grow with CAGRs of 181% and 152% respectively.

The main reasons for such a sharp growth are low barriers to entry in terms of cost of entry decline; various possible product applications – from manufacturing to retail; real business outcomes - productivity and efficiency gains, knowledge transfer, the safety of employees, engaging customers activities.

Figure 3. Top sector based on 2020 market share





In terms of geography, the largest share of AR/VR spending in 2019 is in China -\$5.8 bln, USA - \$5.1 bln, and Europe - \$3.3 bln. This fact confirms that ukrainian AR/VR as a part of Europe has growth opportunities.

As reported by PwC in its report dedicated to the impact of AR and VR on the transformation of business and the economy, the technology will potentially deliver a \$1.5 trillion boost to the global economy by 2030. Moreover, various uses of ImT including the creation of new customer experiences, improving workplace safety, providing employee training contributed \$46.4 billion to the GDP in 2019.

While growing rapidly overall, AR/VR technology will see varying levels of adoption across industries. AR/VR is likely to be most prominent in the gaming

industry (\$12 bln), though applications in healthcare (\$5 bln) and engineering (\$5 bln) also have large business opportunities. Both the healthcare and engineering markets are expected to have over 3 million users of AR/VR each by 2025

Figure 4. AR/VR software global market size forecast by industry, 2025e, [USD, bln]



Source: Goldman Sachs Global Investment Research

Despite the slower than predicted penetration due to lower audience adoption, and technology and cost associated with VR, the market is still expected to grow steadily in the future reaching USD 20 bln in 2020.

If comparing different types of ImT it can be clearly stated that AR provides a larger boost to GDP than VR which is shown on the Figure 5. This might be explained by a larger variety of use of AR technology, including product advertising, retail, logistics, mass events, etc. In terms of pricing, AR is cheaper and easier to develop and establish, being attractive to clients.



Figure 5. Dynamics of AR/VR contribution to global GDP, [USD, bln]

Source: Seeing is believing, PwC

Hardware is the largest VR/AR market, but margins are less attractive than software and content. To take a closer look into each of three competition profiles shown on the Table 2 let's consider the following:

- The content and applications market is very fragmented. It contains many competitors of small and medium size. There is a tendency that giants prefer to invest in start-ups involved in app development and rarely set up R&D department for content because it appears to be more effective. It is a classic example of tech M&A when it's more profitable for a big industry firm to acquire a small IT company with already developed technology than start to build its own R&D.
- Software and Reality Capture development is mainly concentrated among massive tech players (Google, Microsoft, Facebook) while real-time capture is a more dispersed market.

• In hardware market over half of the key VR helmet producers are smartphone makers (Apple, HTC, etc.) while components come from large semiconductor leaders.

Tech Layer	Share of market revenue	Margin Profile
Content and Applications	25-30%	20-40%
Software and Reality Capture	30-35%	20-30%
Hardware	40%	5-10%

Table 2. Share of market revenue and margin profile of AR/VR tech layers

Source: Seeing is believing, PwC

The augmented and virtual reality (AR/VR) market amounted to an estimated 12 billion U.S. dollars in 2018 and is expected to expand drastically in the coming years, with forecasts for 2022 eclipsing 192 billion U.S. dollars. Consumer spending made up the single largest portion of the AR/VR market worldwide, followed by the discrete manufacturing segment, both of which accounted for billions of U.S. dollars in sales.

According to Gartner – one of the greatest IT consulting and research companies in the world, by 2022 70% of enterprises will be experimenting to explore the potential of augmented reality for business while 25% will have deployed immersive technologies to production.

There are several key technical trends impacting AR/VR, among which:

- 1. Improvements in display and rendering technologies. Smartphone displays today have high resolution of over 400 pixels per inch and graphics can be rendered at 60 frames per sec while optic lense costs are decreasing
- 2. Connected networks and real-time data flow. Introduction of 5G Wireless and edge computing enables higher computing and real-time image projections
- Advances in sensor technology blur the borders of the digital and physical world. Consumer desire to bring the information and ease of accessing digital applications to their physical activities with little to no latency.

Immersive technology may be implemented in very different industries and has no limits in this sense. It is an alternative way to increase revenues as far as it allows to demonstrate the product or perform the process of education. The process of product development contains several main stages: graphics and animation design, functionality development, allocation of content on digital platforms, testing.

The average pricing, according to the data provided by the CEO of Ukrainian Immersive technology company Skywell Software, the company which supplies its products and services mainly abroad, is \$400 for Instagram and Facebook AR masks, while the average price for an AR product is \$5 -10 thousand. There are internal factors that influence pricing, which are: type of content used, digital platform, duration of the project. With that many ukrainian companies have been established in the past few years. Figure 6 depicts most prominent AR/VR market players in Ukraine.

Figure 6. AR/VR market in Ukraine [USD, bln]



Source: Unit City

Global law firm Perkins conducted a survey on ImT ("2020 Augmented and Virtual reality survey"), where 200 professionals representing start-ups, tech firms, and investors were asked for their expertise. Hence, it can be concluded that in 2019 the largest AR/VR spending was made by China, the USA, and Europe (3.3 USD, bn), which is a good sign for Ukraine. According to the survey ImT is likely to become mainstream in 2-5 years and sectors to be disrupted by this technology in 2020 are healthcare, education, and training.

Figure 7. Global trends and survey forecasts



Source: International Data Corporation, Perkins

On the basis of analysed information we can compose SWOT analysis for Ukrainian ImT market:

### Strengths

- Broad technical skills in IT field: programming, graphics, coding, user interface design, app development
- Easy to adapt the technology to different businesses
- Various applications of the technology which are almost unlimited
- COVID-19 has shown ukrainian companies the necessity to use services of virtual communication
- Many ukrainian companies are willing and ready to try out the technology on their products

Weaknesses:

- Lack of IT education and data culture throughout the population, substantial part of which doesn't possess basic knowledge on internet search, app downloading, etc.
- Hard to calculate the efficiency of the technology because it's not instantly visible.

- Lack of co-operation between AR/VR content companies and academic research institutions
- Scarcity of investments which are mainly come from abroad Microsoft, Huawei, Samsung built IT capabilities in Ukraine
- Small scale of domestic market and lack of export opportunities especially during Coronavirus outbreak, which doesn't allow for business to sustainably grow

# Opportunities

- Good opportunities for growth
- AR/VR is becoming more popular throughout the advanced part of Ukrainian population, which arises an interest of businesses
- Many big companies are only starting to experiment with VR/AR
- Both tech and content companies are in demand while using the technology
- Low threshold to start production as more and more ready-made elements and affordable technology become available

Threats:

- It takes long time for cash flaws to rise after implementing the technology
- Slow industrial penetration
- Content production budgets remain too small for developing sustainable business
- Fierce competition on a worldwide market
- Main development takes place in North America and Asia instead of Europe
- Consumers do not understand the value of VR/AR for them

### CHAPTER 3. METHODOLOGY

The methodology of this investigation is based on the analysis of one of the top Ukrainian AR/VR companies – Advin. It was chosen as a benchmark of the ukrainian ImT market and its results might be treated as a barometer of the financial performance of the market. However, this is a private company, so the financial statements are incomplete according to GAAP standards. That's why the author concentrated on product segmentation analysis to identify which products drive revenues and which of them are the fastest to grow.

The next step is to analyze the company's projects and their pricing, aiming to identify industries projects of which bring the highest profits and what are average prices per project. To accomplish that the clients were divided following their industry.

Further analysis is based on the overall profitability of Advin and competitors screening. In particular, the author decided to analyse the performance of the close Advin's competitor on a foreign market – Vision.

Additionally, the efficiency of ImT will be depicted based on the increase of time of brand interaction as well as on the survey results.

50 ukrainian respondents filled in the survey the main goal of which was to show the current state of ImT perception and adoption in Ukraine. Besides that, it was aimed to change it by showing real ImT use cases implemented in Ukraine recently. Those cases are:

- 1. Alive package of "Nasha Ryaba"
- 2. The first VR-concert in Europe
- 3. AR-quest in River Mall shopping centre
- 4. Corporate communications with the help of AR.

The core idea of the survey was to assess the change in AR/VR technologies with the help of real ukrainian use cases. First of all It was aimed to get some general information about respondents (degree of education, field of education, gender, age range, entrepreneurship). The second step was to get to know closer the current

attitude and acknowledgement of AR/VR in Ukraine. On the third stage interviewees were shown real use cases supported by video and text materials. Finally, respondents were asked the same questions as in stage 2 in order to make an end-to-end assessment.

### CHAPTER 4. DATA

The data used in this research is mainly obtained from Advin Company and is placed in Appendices II-V.

4.1. Product and revenue segmentation

Advin company possesses several internally-developed AR applications namely Live Portrait, Arloopa, and White Label. Also, it has its own production – development of client-based digital content. That allows a client to fully delegate the project to Advin, as it wouldn't have to develop graphics or video recordings on its own.





Source: Advin Company data



Figure 9. Annual revenue segmentation by product/technology

Source: Advin Company data

# 4.2. Projects and pricing

Figure 10. Client segmentation by industry in 2019, [USD, th]



Source: Advin Company data



Figure 11. Annual revenue segmentation by product, %

4.3. Profitability and clients

After analyzing the clients of the company in 2019 it was observed that 50% of total revenue and 43% of net income was brought by only 6 clients mainly from the FMCG industry, among which: RTM Ukraine, Yarylo, Ogilvy. In terms of revenue in 2017, when Advin was established it was 4.9 USD, th, in 2018 – 36.2 USD, th and in 2019 – 90.8 USD,th.



Figure 12. Advin's revenue and profitability in 2019, [USD, th]

Source: Advin Company data

Source: Advin Company data

4.4. Current perception of the ImT technology in Ukraine

In order to assess the attitude of Ukrainian society to immersive technologies it was conducted a social survey, which included real examples of implementing the technology in Ukraine.

The sample of respondents includes 50 people from different spheres and backgrounds. There is a detailed information on survey participants on Figure 11.

Respondents are almost equally distributed across gender, 36% of them are entrepreneurs. Most of the survey participants are of middle age (20-40 years old). Based on food spends per months it can be stated that 82% of respondents are financially secure.

With regards to educational background 52% of respondents have economical background, 20% - technical, 14% - humanitarian backgrounds. 84% of them have Bachelor's, Master's degree or PhD.

Figure 13. Descriptive statistics of survey participants





21-40%

41-60%

61-100%

1-20%

Source: Survey results

The first stage of a survey was dedicated to investigation of the current perception of ImT by ukrainians. It was found out that considerably large part of respondents (84%) were already familiar with AR/VR technologies.

Notably that the most commonly known ImT applications among respondents are gaming, quests, marketing and mass events (Figure 12).

Figure 14. The most common ukrainian applications of AR/VR according to the survey



Source: Survey results

From the Figure 15. It can be seen that 36% of survey participants agree that ukrainian society is ready for every-day usage of AR/VR technologies. From the other hand a considerable amount of 28% respondents can't see the potential of the technology nowadays in Ukraine. It can be caused by several reasons.

Comparing age categories interestingly that people of 20-30 and <20 tend to use ImT more than people from older age categories. That is an evidence of young people being more adapt to innovations.

Figure 15. Current opinion of the respondents if ukrainians are ready to use AR/VR on a daily basis



Source: Survey results

The second stage of the survey was aimed to show the real ukrainian business projects where ImT were used. Those projects are from top most popular spheres of implementing the technology, in particular: ("Nasha Ryaba"), mass events (the VR-concert of Oleg Vynnyk and quest in RiverMall) and corporate communications. Let's review them in more details:

1. Alive package of "Nasha Ryaba"

### What is it?

Augmented reality on a package, which allows for the brand to communicate directly with is customers. By scanning a QR-code a client gets to know more about:

- Methods and quality of production
- Recipes of cooking chicken
- Feedback form.

Who uses?

Mass consumer.

What for?

To obtain wider information about a product in an interactive way.

2. The first VR-concert in Europe

What is it?

In pandemic conditions and restrictions on offline-events Advin company managed to hold the concert of Oleh Vynnyk on the Olympiyskiy stadium in unusual format. It was an online VR-concert with no physically present audience on the stadium.

Who uses?

Concert viewers

What for?

To hold a concert in pandemic conditions and maintain communication with an audience.

3. AR-quest in River Mall shopping centre

What is it?

Activity devoted to the birthday of River Mall shopping centre in Kyiv. There were 9 VR-locations within the mall, which contained popular 3D-characters with a possibility to record videos or male photos with them. After posting this content to social networks participants automatically participated in a prize lottery.

Who uses?

Visitors of the shopping mall

What for?

Increase the customer loyalty and length of stay. Besides that it allows to attract the customers to the particular shops through a proper product placement and allocation of AR-zones.

4. Corporate communications with the help of AR*What is it?* 

Appeal from the owner of the company "Biosphere" through the corporate journal. It's a prototype of direct communication with employees.

Who uses?

Company employees

What for?

To build the loyalty, increase motivation and give practical recommendations to each employee of a target company. In the meantime, the technology incurs time savings for management of the company.

In order to observe the change in perception of the technology respondents were asked the same question before and after they got familiar with the real Ukrainian ImT projects. First of all its important to identify who our respondents are in terms of educational background, speciality, financial status, gender, etc. After showing those cases very alike with the part 1 questions were asked in order to check if the perception of the technology was changed.

### CHAPTER 5. RESULTS

### 5.1. Production and applications as opportunities for new revenue streams

On Advin's example, it is seen that the establishment and development of production service in the first quarter of 2019 was very successful and it even surpassed all the other company's activities in terms of revenue and captures 45% of TR. Additionally to that, Arloopa app is also one of the leading products of the company. The company charges fees from its customers (companies) for providing the technology. Following that the end-user has to download the app first and then either scan the QR-code or point the camera at the particular image. That is one of the most non-expensive ways to implement AR/VR, so ukrainian potential client companies would be able to afford it because high pricing – is another issue among domestic companies. Moreover, the coronavirus outbreak leads to the cancellation of many events: concerts and conferences in particular forcing customers to stay at home. That's another opportunity for AR/VR developers to hold all the events in virtual reality because Coronavirus made customers turn to immersive experiences at an unprecedented rate. That practice becomes common worldwide.

According to IABM report on ImT Adoption trends 2020 with the Coronavirus outbrake the most AR/VR applications concentrated on live spots events. As many sporting events in Ukraine and around the world were cancelled or postponed (2020 Summer Olympics and Paralympics) the new revenue stream opportunity for ukrainian ImT companies arises. Moreover Covid-19 brought widespread behavioural changes among customers which are likely to adopt available AR/VR opportunities. As consumers massively went online starting from March 2020 the global video streaming traffic increased by 26% and gaming traffic increased by 71% compares to pre-pandemic traffic. That also lead to revenue streams decline in the entertainment industry that depends on live events including sports, live music industries, etc.

### 5.2. Industries with a high potential of adoption ImT

Industries of advertisement, FMCG, mass events, and exhibitions are causing the biggest demand on AR/VR technologies of Advin. Along with that major types of products are interactive packages, events, and VR-zones. That differs from what is observed on the global market, where the use of those technologies dominate in healthcare, education, and training. Obviously, the level of ImT integration abroad is higher, but still, there is potential future growth in those segments in Ukraine too.

From the perspective of technology pricing, in Ukraine, it is considerably lower, then globally. The average price of a project in Advin Company is 70 USD, while abroad it is a minimum of 400 USD.

### 5.3. Profitability and benchmarking

Overall the company grows drastically, with the TR CAGR of 151% in 2018-2019. Interestingly that the cheapest projects for about 0.45% of revenue each bring the highest profitability – more than 80%. The vice-versa is true as well – high-revenue projects (2.5% of revenue each) have comparatively low profitability – up till 40%.

As Advin is a small-size company that is not listed on a stock exchange it is quite difficult to identify its peers and competitors. But using total revenue and product specifications as the main screening criteria several companies were identified and placed in Table 1.

Despite the small amount of TR, the Advin company has comparatively high margins – gross margin in 2019 is 52.8%, net income margin is 41.2%. That creates favourable opportunities for potential investors or start-ups.

Company	Revenue, USD m	ROA	ROE	Gross Margin	EBITDA margin	Net income margin	Debt/Equity
Apple Inc	260,174	15.7%	55.9%	37.8%	28.4%	21.2%	8%
Alphabet Inc	161,857	13.5%	18.1%	55.6%	27.4%	21.2%	-57%
Microsoft Corp	143,015	15.1%	40.1%	67.8%	46.0%	31.0%	-54%
Sony Corp	76,815	2.6%	14.8%	34.3%	14.5%	7.0%	-46%
Intel Corp	71,965	16.5%	28.7%	58.6%	48.3%	29.2%	20%
Facebook Inc	70,697	16.0%	20.0%	81.9%	45.2%	26.1%	-54%
Qualcomm Inc	19,573	13.2%	148.1%	56.1%	24.5%	22.4%	75%
NVIDIA Corp	10,918	23.4%	33.2%	62.0%	36.1%	25.6%	-73%
Snap Inc	1,716	-6.7%	-9.9%	47.8%	-52.3%	-60.3%	-54%
Lumentum	1,679	14.0%	25.9%	38.7%	24.2%	8.1%	-25%
Advin	0.091	-	-	52.8%	-	22.4%	-
Industry	74,449	11.9%	35.2%	45.0%	22.0%	12.0%	-29.3%

Table 3. Advin's revenue and profitability in 2019, [USD, th]

Source: Reuters

### 5.4. Technology efficiency in terms of time of brandinteraction

In order to show the ImT efficiency 20 projects ukrainian business projects were analysed. These projects covered 3 main spheres: FMCG marketing, Retail centers and events organized be local government. Table 1 shows the average duration of the projects by each category.

Table 4. Average project duration and time of interaction by industry

Industry	Duration of the project,	Total time of interaction,	Time of interaction,
j	days	hours	hours/day
FMCG	159	259	3
Retail	30	204	7
Government	1	57	152

Source: Company data

Firstly, the average duration of one project in FMCG, retail and government differ drastically. Usually, government projects last for about one day, engaging many people. The prime example of a government project is The Virtual Zoo, held in Kyiv district. FMCG projects are mostly long-term (5 months on average) and they usually associated with interactive packaging.

Secondly, the hourly time of customer interaction with digital content for FMCG and retail appeared to be alike – 259 and 204 hours respectively, while in government projects it is significantly lower – 57 hours due to the lower duration of a project.

Thirdly, the average hours per day spent in digital engagement are much higher in government projects – 152 hours, while FMCG and retail receive 3 and 7 hours per day. The retail ImT projects are mainly aimed at mass events and VR-zones, where customers spend considerably more time.

Overall, the efficiency of ImT technology can be measured in different ways, but in this research, it would be measured in terms of customer interaction time with the product.

### 5.5. ImT survey results

Moving on to the survey results it has to be stated that ukrainian society is tends to believe in future perspectives of ImT especially after being informed how it works in real ukrainian market conditions.

Figure 13 presents how the perception of the technology changes in the positive direction. 32% of the respondents have changed their initial view on the technology towards being more ready to use it every day. That is a big evidence of a huge importance for customers to be informed and popularization of ImT can make our society understand the value of the technology better.



Figure 16. Change in opinion of the respondents if ukrainians are ready to use AR/VR on a daily basis

Source: Survey results

Additionally, the respondents were asked to predict in how many years ImT will be in a daily usage (Figure 14) And with the use cases given respondents have changed their minds towards shortening the questioned time period.

Figure 17. Change in predictions of the respondents on the number of years after which ukrainians will use ImT on a daily basis



Source: Survey results

Also, it is viable to show which age categories are going to use ImT in the nearest future and how this perception is changed after people get to know about the technology more. From Figure 15 it is clearly seen that now 15-24 and 25-54 age categories are the most likely to use AR/VR but it appears that more mature age categories (55-64) can benefit from it too.

Finally, the respondents were asked if they see the value of ImT for themselves (Figure 16). Having seen the real business cases 70% of them acknowledged that they see the value versus 10% that don't recognize it. It has to be mentioned that 24% of survey participants changed their minds towards the good value of ImT for them.

Figure 18. Change in predictions of the respondents on the number of years after which ukrainians will use ImT on a daily basis



Source: Survey results

Figure 19. Change in predictions of the respondents on the age categories that will be using ImT in the nearest future.



Source: Survey results

Overall, the positive shifts of people's attitudes towards ImT are very depictive and that is the key for ukrainian society to be more innovative and ready for adoption of disruptive changes.

### CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

Ukrainian Immersive technology market is currently in an emerging stage, but have great growth perspectives, which follows from overall industry analysis and Advin company analysis in particular. As a result of this investigation following results were obtained:

- After analyzing Advin Co., which is the third company in the ukrainian market of immersive technology it can be concluded that such product segments as company-owned applications and content production are the most promising in Ukraine. That's why ukrainian ImT companies, who work for foreign markets, may consider providing those services in Ukraine too.
- The ImT in Ukraine is mainly used in an advertisement, FMCG packaging, mass events, and exhibitions, where the average price of a project in 2019 is \$70, according to Advin company data.
- Coronavirus outbreak has led to an unprecedented demand in various online applications of ImT mainly implemented in gaming (26% traffic increase), video (71% traffic increase), sports and music industries.
- The most demanded AR/VR products are interactive packages, event animations, and VR zones.
- In Advin Company 9% of clients bring 50% of total revenue and 43% of net income, so it's reasonable for the company to concentrate on big clients.
- Overall profitability of ukrainian company Advin as higher than the industry average and that makes the market attractive.
- Government projects usually are short-term while attracting people more, so the collaboration of FMCG or retail company with the government in terms of AR/VR interaction can potentially bring new clients.

- The survey which contains 50 answers of people from mainly economical and technical background with a decent level of education and financial stability clearly states that ukrainians are ready to percept innovations and some of them are already using them.
- The most commonly known applications of AR/VR technologies according to the survey are gaming and quests, marketing and mass events.
- Information plays an immense role on the ImT perception of ukrainian society. Having got acquainted with the real business cases people drastically change their opinions because they start to find the value for themselves.
- In numbers: 58% of interviewees now believe that our society is ready to use AR/VR on a daily basis; 76% of respondents predict that ImT will be actively used within 1-5 years;
- People of the 15-24 and 25-54 are the most likely to adopt the technology but 55-64-year old people may find the value of its usage after getting informed and instructed
- 70% of the respondents now believe that ImT can bring them value and it's worth to mention that amount of people with positive attitude to the technology considerably rises (by 24%) as people receive constructive information on the possible ways of the technology usage.

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# APPENDIX I

# Advin Company project breakdown in 2019

N⁰	Client	Revenue/client	Costs	EBITDA	Profitability	Fraction
2	РТМ УКраина	308,340	199,089	109,251	35.4%	12.5%
2	гоу маркетинг	249,498	170,454	79,044	31.7%	10.1%
2	Ярило	226,258	137,805	88,453	39.1%	9.1%
1	Огилви	183,120	134,285	48,835	26.7%	7.4%
2	Арт максима	141,851	87,134	54,717	38.6%	5.7%
1	Позитив продакшен	140,400	98,128	42,272	30.1%	5.7%
1	Экония	120,240	83,464	36,776	30.6%	4.9%
1	Лакалут	83,208	47,494	35,713	42.9%	3.4%
1	Оушен плаза	81,120	44,637	36,483	45.0%	3.3%
2	Таврийские игры	57,028	35,807	21,221	37.2%	2.3%
2	Rockets	55,054	28,822	26,232	47.6%	2.2%
1	Λ кафа	51,480	31,514	19,966	38.8%	2.1%
3	Пломбир эвент	46,413	26,137	20,276	43.7%	1.9%
	интерактивный				72.2%	
1	зоопарк (крюкивська	40,500	11,243	29,257		
	миська рада)	10.000	11.500	20.470	74.00/	1.6%
1	Асино Украина	40,000	11,530	28,470	/1.2%	1.6%
1	Домино	37,500	16,020	21,480	57.3%	1.5%
1	Дрим хаус	35,190	20,571	14,619	41.5%	1.4%
2	Инго Украина	34,705	20,776	13,929	40.1%	1.4%
1	Яктак	34,327	16,916	17,410	50.7%	1.4%
2	Биосфера	29,590	16,601	12,989	43.9%	1.2%
1	Ляпис Трубецкой	29,505	13,333	16,172	54.8%	1.2%
1	Медиахедс	25,632	16,556	9,076	35.4%	1.0%
1	Меланчик	21,800	570	21,230	97.4%	0.9%
1	Интерконтиненталь	21,511	14,083	7,428	34.5%	0.9%
1	Ньюмаркет солюшен	21,029	14,777	6,251	29.7%	0.8%
1	$\Lambda$ юкс $\Phi M$	20,800	13,132	7,668	36.9%	0.8%
1	Твига гоу	19,440	13,654	5,786	29.8%	0.8%
1	Ивент агентство	17,850	9,696	8,154	45.7%	
	Ника	17 504	<b>T F</b> ( <b>A</b>	40.000	<b> 1</b> 0/	0.7%
1	БИИТ	17,581	7,542	10,038	57.1%	0.7%
1	Гиренко	17,516	7,196	10,320	58.9%	0.7%
1	Бизнес групп	16,560	7,881	8,679	52.4%	0.7%
1	КБ Южное	16,421	3,189	13,232	80.6%	0.7%
1	ЮМЗ	16,259	5,620	10,639	65.4%	0.7%
N⁰	Client	Revenue/client	Costs	EBITDA	Profitability	Fraction

1	Худая Эмилия	14,852	2,430	12,422	83.6%	0.6%
1	Слободяник О.О	14,653	11,305	3,348	22.8%	0.6%
1	$V\Lambda\Phi$	12,960	7,236	5,724	44.2%	0.5%
2	Онифарма Киев	12,907	8,412	4,495	34.8%	0.5%
1	Мери клер	12,480	7,568	4,912	39.4%	0.5%
1	Пиар агенство	12,480	7,528	4,952	39.7%	
	Радник					0.5%
2	Инкерман	12,077	5,502	6,575	54.4%	0.5%
1	Веранда на Днепре	10,125	10,450	-325	-3.2%	0.4%
1	Лакилат	8,262	3,024	5,238	63.4%	0.3%
1	украинский бизнес хаб топ 100	8,231	4,920	3,312	40.2%	0.3%
1	Ленд медиа	7,834	2,769	5,065	64.7%	0.3%
1	Торговый будинок	7,800	3,299	4,501	57.7%	
	Конти					0.3%
1	Господинов Дмитрий	7,000	4,584	2,416	34.5%	0.3%
2	Тик так то е	6,990	3,692	3,297	47.2%	0.3%
2	Энджой промо	6,240	3,764	2,476	39.7%	0.3%
1	Бон буасон	6,133	1,905	4,228	68.9%	0.2%
	Армения заказчик	5,400	0	5,400	100.0%	0.2%
1	Институт клеточной	4,371	1,880	2,491	57.0%	
	терапии					0.2%
1	Автоломбард	4,000	2,140	1,860	46.5%	0.2%
1	Кидсвит	3,120	1,882	1,238	39.7%	0.1%
	ПП ЦНПНТ Малес	3,120	1,882	1,238	39.7%	
	Филипп морис	0 7 0 7	4 4 4 7	1 200	47 40/	0.1%
1	Шендрик (Фигаро)	2,/3/	1,447	1,290	4/.1%	0.1%
1	Дети Днепра	2,700	270	2,430	90.0%	0.1%
1	Старт Днипро	2,700	270	2,430	90.0%	0.1%
1	Сегодня	2,697	810	1,887	70.0%	0.1%
1	Ви плей	2,670	1,338	1,332	49.9%	0.1%
1	туи	1,620	972	648	40.0%	0.1%
1	Диджитал шоу	1,500	720	780	52.0%	0.1%
1	Евронелли	1,500	270	1,230	82.0%	0.1%
1	Брауд Вадим	1,400	690	710	50.7%	0.1%
1	Метинвест	1,400	690	710	50.7%	0.1%
1	Полищук Антон	1,400	690	710	50.7%	0.1%
1	Данилевский Сергей	1,394	743	651	46.7%	0.1%
1	Харьковский	1,300	660	640	49.2%	
	водоканал					0.1%
1	Фаворит	1,275	652	623	48.9%	0.1%
1	Тарас госсан	1,000	400	600	60.0%	0.0%
	CIIIA	194	0	194		0.0%
8	68 clients	2,474,714			48.34 %	
1						100.0%

# APPENDIX II

# Advin Company detailed client breakdown by category in 2019

Client category		Client category	Rev/project	Revenue, UAH	A fraction of Total Revenu
Advertisement/event agencies	2 5	РТМ УКраина	308340		C
0		гоу маркетинг	249498		
		Огилви	183120		
		Арт максима	141851		
		Таврийские игры	57028		
		Rockets EVENT (ФОП РОДІНОВА Г.П.)	55054		
			16113		
			37500		
			35190		
		Дрим хаус Мелиохелс	25632		
		Интерконтиценталь	21511		
		Ньюмаркет солюшен	21029		
		Твига гоу	19440		
		Ивент агентство	17850		
		Ника	1,000		
		БИ ИТ	17581		
		Пиар агенство Радник	12480		
		Ленд медиа	7834		
		Тик так то е	6990		
		Энджой промо	6240		
		Брауд Вадим	1400		
		Метинвест	1400		
		Полищук Антон	1400		
		Данилевский Сергей	1394		
		Фаворит	1275		
		Ляпис Трубецкой	29505		
		Автоломбард	4000		
		Господинов	7000		
		Дмитрий			
		Тарас госсан	1000	1318953	53.3%
FMCG	1	Ярило	226258		
	1	Экония	120240		
		Лакалут	83208		
		•			

Client category		Client category	Rev/project	Revenue, UAH	A fraction of Total Revenu
		Асино Украина	40000		C
		Яктак	34327		
		Гиренко	17516		
		Онифарма Киев	12907		
		Инкерман	12077		
		Лакилат	8262		
		Торговый будинок Конти	7800		
		Бон буасон	6133	568728	23.0%
Restaurants	2	Λκαφα	51480		
		Веранда на Анепре	10125	61605	2.5%
Shopping centres	1	Оушен плаза	81120		
Iournals and magazines	5	Худая Эмилия	14852		
J		украинский бизнес хаб топ 100	8231		
		Сегодня	2697		
		Ви плей	2670		
		Мери клер	12480	40930	1.7%
Internal marketing (HR)	1 6	Инго Украина	34705		
		Биосфера	29590		
		Бизнес групп	16560		
		КБ Южное	16421		
		ЮМЗ	16259		
		$V\Lambda\Phi$	12960		
		Кидсвит	3120		
		ПП ЦНПНТ Малес Филипп морис	3120		
		Шендрик (Фигаро)	2737		
		Дети Днепра	2700		
		Старт Днипро	2700		
		туи	1620		
		Диджитал шоу	1500		
		Институт клеточной терапии	4371		
		Евронелли	1500		
		Харьковский водоканал	1300	151162	6.1%
Mass events, exhibitions	3	Позитив продакшен	140400		
		интерактивный зоопарк (крюкивська	40500		
		Слоболяник О О	14653	195553	7 9%
Show business	2	Люкс ФМ	20800	20800	0.8%
Silow Bublicoo	-	Меланчик	21800	21800	0.9%

### APPENDIX III

# Quarterly revenue breakdown of Advin Company

1Q	2017	Fraction	1Q	2 <b>Q</b>	3Q	4Q	2018	Fraction	1Q	2 <b>Q</b>	3Q	4Q	2019	Fracti
4,826	4,826	100%	6,245	2,580	4,552	22,361	35,739	100.0%	10,027	14,122	29,525	37,320	90,994	100.0
4,826	4,826	100%	6,245	2,580	4,552	8,407	21,785	61.0%	7,187	2,653	4,474	2,632	16,945	18.6
0	0	0%	0	0	0	2,815	2,815	7.9%	1,948	1,651	3,980	11,848	19,427	21.3
0	0	0%	0	0	0	0	0	0.0%	893	9,325	18,171	12,925	41,314	45.4
0	0	0%	0	0	0	11,139	11,139	31.2%	0	0	0	9,055	9,055	10.0
0	0	0%	0	0	0	0	0	0.0%	0	0	2,000	740	2,740	3.0
0	0	0%	0	0	0	0	0	0.0%	0	493	900	120	1,513	1.7
	1Q 4,826 4,826 0 0 0 0 0	$\begin{array}{cccc} 1Q & 2017 \\ 4,826 & 4,826 \\ 4,826 & 4,826 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{array}$	1Q         2017         Fraction           4,826         4,826         100%           4,826         4,826         100%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%           0         0         0%	1Q         2017         Fraction         1Q           4,826         4,826         100%         6,245           4,826         4,826         100%         6,245           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0           0         0         0%         0	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1Q         2017         Fraction         1Q         2Q         3Q         4Q           4,826         4,826         100%         6,245         2,580         4,552         22,361           4,826         4,826         100%         6,245         2,580         4,552         8,407           0         0         0%         0         0         0         2,315           0         0         0%         0         0         0         0           0         0%         0         0         0         0         0           0         0%         0         0         0         1,139           0         0%         0         0         0         0           0         0%         0         0         0         0           0         0%         0         0         0         0           0         0%         0         0         0         0	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1Q         2017         Fraction         1Q         2Q         3Q         4Q         2018         Fraction         1Q           4,826         4,826         100%         6,245         2,580         4,552         22,361         35,739         100.0%         10,027           4,826         4,826         100%         6,245         2,580         4,552         8,407         21,785         61.0%         7,187           0         0         0%         0         0         2,815         2,815         7.9%         1948           0         0         0%         0         0         0         0.0%         893           0         0         0%         0         0         11,139         11,139         31.2%         0           0         0%         0         0         0         0         0         0.0%         0           0         0%         0         0         0         0         0.0%         0	1Q         2017         Fraction         1Q         2Q         3Q         4Q         2018         Fraction         1Q         2Q           4,826         4,826         100%         6,245         2,580         4,552         22,361         35,739         100.0%         10,027         14,122           4,826         4,826         100%         6,245         2,580         4,552         8,407         21,785         61.0%         7,187         2,653           0         0         0%         0         0         2,815         2,815         7.9%         1,948         1,651           0         0         0%         0         0         0         0.0%         893         9,325           0         0         0%         0         0         1,1139         11,139         31.2%         0         0           0         0%         0         0         0         0         0.0%         0         493	1Q         2017         Fraction         1Q         2Q         3Q         4Q         2018         Fraction         1Q         2Q         3Q           4,826         4,826         100%         6,245         2,580         4,552         22,361         35,739         100.0%         10,027         14,122         29,525           4,826         4,826         100%         6,245         2,580         4,552         8,407         21,785         61.0%         7,187         2,653         4,474           0         0         0%         0         0         2,815         2,815         7.9%         19,494         1,612         39,800           0         0         0%         0         0         2,815         2,815         7.9%         19,481         1,613         3,980           0         0         0%         0         0         0         0.0%         9,325         18,171           0         0         0%         0         0         11,139         11,139         31.2%         0         0         0         2,000           0         0%         0         0         0         0.0%         0         0,00%         0,00%	1Q         2017         Fraction         1Q         2Q         3Q         4Q         2018         Fraction         1Q         2Q         3Q         4Q           4,826         4,826         100%         6,245         2,580         4,552         22,361         35,739         100.0%         10,027         14,122         29,525         37,320           4,826         4,826         100%         6,245         2,580         4,552         8,407         21,785         61.0%         7,187         2,653         4,474         2,632           0         0         0%         0         0         2,815         2,815         7.9%         1,948         1,651         3,980         11,848           0         0         0%         0         0         0,00%         893         9,325         18,171         12,925           0         0%         0         0         11,139         11,139         31.2%         0         0         9,055           0         0%         0         0         0         0,00%         0         493         900         120	1Q         2017         Fraction         1Q         2Q         3Q         4Q         2018         Fraction         1Q         2Q         3Q         4Q         2019           4,826         4,826         100%         6,245         2,580         4,552         22,361         35,739         100.0%         10,027         14,122         29,525         37,320         90,994           4,826         4,826         100%         6,245         2,580         4,552         8,407         21,785         61.0%         7,187         2,653         4,474         2,632         16,945           0         0         0%         0         0         2,815         2,815         7.9%         1,948         1,651         3,980         11,848         19,427           0         0         0%         0         0         0         0.0%         893         9,325         18,171         12,925         41,315           0         0%         0         0         11,139         11,139         31.2%         0         0         0         9,055         9,055           0         0%         0%         0         0         0         0.0%         0         0 <t< td=""></t<>

# APPENDIX IV

# Advin Company revenue breakdown by category in 2019

Client category	Clients	Revenue, \$	Fraction	Client	Clients	Rev
				category		
Photozones		7633	8.39 %	Photozones	Таврийск	
Interactive		33704	37.04 %		Медиахед	
RETAIL		8300	9.12 %		Твига гоу	
Event		16644	18.29 %		Инго-	
VR-zones		36 9365	10.29 %		Events	
HR/Virtual communications		3190	3.51 %		Ньюсмар	
Journals and magazines		1650	1.81 %		Rockets	
Overall		90993	100 %		TOB	

# APPENDIX V

# Income Statement of Vision Company, USD m

	2019	2018	2017	2016	2015	2014
Total Revenue	22,977	20,609	18,358	15,082	13,880	12,702
Cost of Revenue, Total	4,165	3,856	3,248	2,764	2,553	2,382
Gross Profit	18,812	16,753	15,110	12,318	11,327	10,320
Selling/General/Admin. Expenses, Total	2,755	2,579	2,391	2,054	1,755	1,735
Depreciation/Amortization	656	613	556	502	494	435
Unusual Expense (Income)	400	607	19	1,879	14	453
Total Operating Expense	7,976	7,655	6,214	7,199	4,816	5,005
Operating Income	15,001	12,954	12,144	7,883	9,064	7,697
Interest Expense, Net Non-Operating	(533)	(612)	(563)	(427)		
Interest Inc.(Exp.),Net-Non-Op., Total	(533)	(612)	(563)	(427)		
Other, Net	416	464	113	556	(69)	27
Net Income Before Taxes	14,884	12,806	11,694	8,012	8,995	7,724
Provision for Income Taxes	2,804	2,491	4,995	2,021	2,667	2,286
Net Income	12,080	10,301	6,699	5,991	6,328	5,438

# APPENDIX VI

# Balance Sheet of Vision Company, Assets, USD m

	2019	2018	2017	2016	2015	2014
Cash and Short Term Investments	12,074	11,709	13,438	8,938	6,015	3,950
Accounts Receivable - Trade, Net	1,542	1,208	1,132	1,041	847	822
Total Receivables, Net	4,590	2,790	2,554	2,740	1,332	1,699
Prepaid Expenses	712	562	550	151	137	103
Other Current Assets	3,594	3,155	2,481	2,484	2,537	3,810
Total Current Assets	20,970	18,216	19,023	14,313	10,021	9,562
Property/Plant/Equipment, Total - Gross	6.570	5.697	5.143	4.798	4.283	3.915
Buildings - Gross	965	898	865	839	803	787
Land/Improvements - Gross	71	69	72	74	71	71
Machinery/Equipment - Gross	3,441	2,916	2,533	2,378	2,022	1,784
Construction in Progress - Gross	180	153	139	125	120	76
Other Property/Plant/Equipment - Gross	1,913	1,661	1,534	1,382	1,267	1,197
Property/Plant/Equipment, Total - Net	2,695	2,472	2,253	2,150	1,888	1,892
Accumulated Depreciation, Total	(3,875)	(3,225)	(2,890)	(2,648)	(2,395)	(2,023)
Goodwill, Net	15,656	15,194	15,110	15,066	11,825	11,753
Intangibles, Net	26,780	27,558	27,848	27,234	11,361	11,411
Long Term Investments	2,157	4,082	1,926	3,977	3,429	3,050
Note Receivable - Long Term				731	627	597
Other Long Term Assets, Total	4,316	1,703	1,817	564	216	304
Total Assets	72,574	69,225	67,977	64,035	39,367	38,569

# Balance Sheet of Vision Company, Liabilities and Equity, USD m

Liabilities						
Accounts Payable	156	183	179	203	127	147
Accrued Expenses	3,624	3,495	2,868	2,782	2,121	2,303
Current Port. of LT Debt/Capital Leases		0	1,749			
Other Current liabilities, Total	9,635	7,627	5,198	5,061	3,107	3,556
Total Current Liabilities	13,415	11,305	9,994	8,046	5,355	6,006
Total Long Term Debt	16,729	16,630	16,618	15,882	0	0
Total Debt	16,729	16,630	18,367	15,882	0	0
Deferred Income Tax	4,807	4,618	5,980	4,808	3,273	4,145
Other Liabilities, Total	2,939	2,666	2,625	2,387	897	1,005
Total Liabilities	37,890	35,219	35,217	31,123	9,525	11,156
Preferred Stock - Non Redeemable, Net	5.462	5.470	5.526	5.717		
Additional Paid-In Capital	16,541	16,678	16,900	17,395	18,073	18,299
Retained Earnings (Accumulated Deficit)	13,502	11,318	9,508	10,462	11,843	9,131
Unrealized Gain (Loss)	6	(17)	73	36	5	31
Other Equity, Total	(827)	557	753	(528)	(79)	(48)
Total Equity	34,684	34,006	32,760	32,912	29,842	27,413
Total Liabilities & Shareholders' Equity	72,574	69,225	67,977	64,035	39,367	38,569

# APPENDIX VII

# Cash Flow Statement of Vision Company, Assets, USDm

	2019	2018	2017	2016	2015
Net Income/Starting Line	12,080	10,301	6,699	5,991	6,328
Depreciation/Depletion	656	613	556	502	494
Deferred Taxes	214	(1,277)	1,700	(764)	195
Non-Cash Items	6,137	5,743	4,837	3,371	3,112
Changes in Working Capital	(6,303)	(2,439)	(4,475)	(3,526)	(3,545)
Accounts Receivable	(1,866)	(293)	40	326	359
Other Assets	(6,740)	(4,623)	(4,775)	(3,823)	(3,011)
Accounts Payable	1,907	265	(206)	(259)	(565)
Accrued Expenses	396	2,212	466	230	(328)
Cash from Operating Activities	12,784	12,941	9,317	5,574	6,584
Capital Expenditures	(756)	(718)	(707)	(523)	(414)
Other Investing Cash Flow Items, Total	165	(2,366)	1,442	(10,393)	(1,021)
Cash from Investing Activities	(591)	(3,084)	735	(10,916)	(1,435)
Financing Cash Flow Items	(1,347)	(94)	(91)	(82)	402
Total Cash Dividends Paid	(2,269)	(1,918)	(1,579)	(1,350)	(1,177)
Issuance (Retirement) of Stock, Net	(8,445)	(7,028)	(6,742)	(7,062)	(2,828)
Issuance (Retirement) of Debt, Net	0	(1,750)	2,488	15,971	0
Cash from Financing Activities	(12,061)	(10,790)	(5,924)	7,477	(3,603)
Foreign Exchange Effects	(277)	(101)	236	(34)	1
Net Change in Cash	(145)	(1,034)	4,364	2,101	1,547
Net Cash - Beginning Balance	10,977	12,011	7,647	3,518	1,971
Net Cash - Ending Balance	10,832	10,977	12,011	5,619	3,518