POTENTIAL CONSEQUENCES OF IT DISRUPTIONS ON THE VALUE OF COMPANIES

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Abstract: The ever-increasing usage of technology and upsurge of tech companies brings attention to an important topic, related to the consequences of disruptions that may occur with these technologies. In this research paper the analysis is based on the effects these outages have on a company's value, more specifically isolating potential consequences the latest outage would have on the affected company, based on an analysis of previous cases. These cases showed that the effects depend on the company itself, what are it functions in and the grade at which technology is integrated in its activities, and logically the most affected by tech disruptions are tech companies. These effects can be both monetary, as well as reputational and have a possibility of affecting the company's value as well.

Keywords: *IT disruption, finance, value, dependency*

JEL: *G39*

1. Introduction

Digitalisation and the technological upsurge in modern times lead to both a large number of benefits and significant risks and negatives in terms of scale and impact. Newer and more comprehensive technological tools are being introduced in companies every day, impacting both labour productivity and the overall structure of companies. The dependence on technology is becoming clearer and more extensive, bringing with it the necessity of these technologies to be constantly up and running properly.

These growing dependencies, coupled with the increasingly advanced implementation of all shapes and sizes of technological tools in companies' operations, raises the question of what the impact would be on the value of these companies in the event of a potential failure of these systems.

The topic is interesting because the daily development of technology implies the increasing risk of potential problems coming with their implementation. Uncovering the potential effects that a significant IT disruption could have on companies and their value could provide an impulse towards the development of prevention mechanisms.

The purpose of this research paper is, by examining the manifestation of significant size disruptions in technology infrastructure and their effects on companies over the years, to answer what are the potential effects of the 2024 CrowdStrike IT disruption on the company based on similar events that have occurred in the past. The main thesis is that an IT outage could have a negative impact on a company's value, depending on the company's reaction to it.

The main task, which has been realized in this paper, consists in identifying the effects on the value of companies of previous IT disruptions and the potential effects of the latest such issue.

2. Exposition

The adoption of technology in the operations of companies is happening faster and on a larger scale than ever before. One of the many examples of an invaluable technological tool used by almost every company are the ERP systems. This software provides significant improvements

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to the company environment, and this is revealed in a study by Panorama consulting group which showed that after implementing these systems more than 90% of the companies that have implemented them have realized improvements in "Productivity and Efficiency", "Reduction in Maintenance Costs", "Improvement in Customer Experience", etc (Panorama consulting group, 2024). These improvements also inevitably lead to an improvement in the value of the company, due to the direct relationship between value and revenue increase, as well as cost reduction.

As it would seem, the technological expansion of a company is a key element in its normal and successful development. However, the implementation of these technologies entails significant risks in terms of many factors such as: security, normal functioning of processes, data integrity, etc. This is confirmed by a report published by IBM, which studied the effects of cyber-attacks on 604 companies, mentioning that 70% of them experienced either significant or very significant consequences of a cyber-attack. It also mentions that the average cost to a company of such an attack on its technology infrastructure to be around $4.88 million, which included delayed operations, loss of customers, etc. It is also important to note that only 12% of the affected organizations were able to fully recover from these outages (IBM, 2024). IBM define cyber-attacks as an intentional effort to disrupt the normal functioning of IT systems, which include stealing, altering, disabling, or destroying data, causing issues with applications or similar activity, through unauthorized access to a network, computer system or digital device (IBM). Other definitions are more or less identical, for example CISCO define a cyberattack as a malicious and deliberate attempt to breach unauthorized information of another individual or organization (CISCO). In terms of a definition for an IT outage, the National Institute of Standards and Technology have given a definition, which sums up those given by other organizations, which is: *"A period when a service or an application is not available or when equipment is not operational."* (NIST)

Because of the potential negative effects a similar outage or disruption would have on a company, it is necessary to have a clear understanding of the potential risks and their countermeasures. Respectively, this would lead to the creation of prevention mechanisms. After the most recent outage in July 2024, the Columbian school of professional studies outlined 4 specific risks, which are evident and appeared: Automation Risks, quality assurance failures, the illusion of control and human element (Bhujle, 2024). Each of these risks bears significance to a company's operation, as it's very highly likely that they need to take them into account when planning their IT strategy and infrastructure. Columbia SPS also point out that even tech giants like Microsoft have significant cybersecurity risks, which also need to be studied, and the vulnerable points need to be further improved upon.

Since the IT disruption that occurred in 2024 was of a massive scale, impacting multiple systems, it is necessary to examine similar disruptions in information technology. For the purpose of the analysis, historical data on 3 significant size disruptions in the technology infrastructure of companies are examined.

The analysis is performed in terms of the main company that suffered this collapse. The focus is mainly on what are the effects on it from a financial perspective, how have its key financial ratios changed. The ratios chosen for the analysis are the company's profit margins, return on equity, current liquidity are chosen as well as its value before and after the disruption. This has been done through 3 valuations applying the market method to value the company based on market data for the company and close peer companies:

- *One year prior to the occurrence of this collapse, which will be used as a base year for comparison*
- *One year after its occurrence*

- *Three to seven years after its occurrence.*

This will give an idea of the short- and long-term effect that such a collapse would have on a company of significant scale.

Based on the data obtained, conclusions will be drawn about the effects of these disruptions on companies and their value, and corresponding predictions will be made about the effects of the recent IT disruption that occurred in June 2024.

The approach chosen for this study is the market valuation method, which is part of the comparative models. It was chosen because of the ability to isolate different periods without the need to make forecasts or extrapolate future company performance. In this way, it becomes possible to perform multiple valuations of a company, taking into account the market situation, by means of the selected analogues. The definition of this model is wide-ranging, but all authors agree that it is a method based on the market performance of the company and the selected market analogues. Some of the definitions considered include that of Professor Damodaran, which considers the value of a company under this approach as a comparison of the share price of a company with that of a selected group of similar 'analogue' companies (Damodaran, 2006), and the definition Professor Nenkov defines, which considers the market approach as one in which assets are valued based on the market price of similar assets (Nenkov, 2015). It is also important to consider the international valuation standards on which valuations under this approach are based. In them, it is defined as an approach to determine the value of an asset by comparing it to identical or comparable assets for which price information is available (IVS, 2023). Comparable companies are selected based on their scale, line of business, and selected financial metrics (Net Margin, EBITDA Margin, ROE and ROA). Through these constraints, it is possible to isolate suitable peer companies to provide a clearer picture of the state of the companies being evaluated. The maximum number of peers for each valuation will be 3. These financial ratios will also be analysed in order to determine the internal financial performance of the affected companies.

For the purpose of the analysis, a template has been constructed in which to place the information on the market performance of the companies, based on historical data from the stock exchanges on which they are traded. The financial information is in currency US dollar in order to eliminate exchange rate effects. All the amounts are taken in their native currency and translated to USD through computation using the provided exchange rates by the European Central Bank. The data are derived based on the 3 periods described earlier in this paper and refer to the company whose systems experienced this disruption. The technology disruptions that have been selected for analysis are:

- The British Airways IT disruption that left 75,000 people without a flight in May 2017. (Reuters, 2024)
- Google's temporary 1-hour service outage in December 2020 (Reuters, 2024)
- The collapse of META services (Facebook, Instagram, Whatsapp), which for 6 hours were unavailable in October 2021. (Reuters, 2024)

The analysis of these 3 of what are considered some of the most significant technological disruptions are used as the basis for deriving the potential consequences for the June 2024 technological disruption.

3. Analysis and results

3.1. First case - International Consolidated Airlines Group SA

The first analysed case is that of British Airways, owned by the company International Consolidated Airlines Group SA. This case study looks at the company described and what effect this disruption has had on it. All flights on the 27th of May were cancelled, which led to a significant disruption in the normal operations of the company. (CNN, 2017). The company affected is International Consolidated Airlines Group SA. For the purpose of the valuation, the following peer companies are considered: Delta Air Lines; Ryanair Holding; Singapore Airlines. All of them are functioning companies, which are selected as peers, as their financial data, size of the business and margins are very similar to those of the affected company and thus make for an adequate valuation. The three valuations described were carried out as follows:

3.1.1. Valuation based on financial data 1 year before the crash (2016).

For the purpose of the analysis, data as of 31.12.2016 was used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this year is used as the baseline for the comparison. When computing the market multiples of the 3 selected companies and their subsequent integration in the valuation model, we receive a value for International Consolidated Airlines Group SA of 11.36 USD per share, while the market price for the company is recorded as 5.35 USD per share. This means that the company should be undervalued with more than 100% according to the valuation. The ROE is equal to 33%,while the Net margin = 8%, EBITDA Margin = 15%. The current liquidity is 1.05. The detailed valuation can be seen in the table below:

Table 1. Valuation of International Consolidated Airlines Group SA as of 31.12.2016

International Consolidated Airlines Group SA USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	34 410 629 256,12	18 341 961 459,45	26 751 065 769,62
Total Debt	9 434 195 000,00	9 434 195 000,00	9 434 195 000,00
Total Cash on hand	7 073 011 000,00	7 073 011 000,00	7 073 011 000,00
Implied Market value	32 049 445 256,12	15 980 777 459,45	24 389 881 769,62
Shares outstanding	2 120 000 000,00	2 120 000 000,00	2 120 000 000,00
Price per multiple	**15,12**	**7,54**	11,50
Weight of each price	40%	40%	20%
Weighed price per multiple	6,05	3,02	2,30
Final price	11,36 USD		

Source: Personal calculations

3.1.2. Valuation based on financial data 1 year after the crash (2018).

For the purpose of the analysis, data as of 31.12.2018 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This is the year following the IT disruption. The aim of analysing it is to see if there are any visible short-term effects of it on the firm's value. The picture shown is interesting, because, although the company suffered a big IT outage, which caused severe delays and cancelled flights, the valuation model provided a price of 13.09 USD per share, while the market price of the company is 7.81 USD per share as of 31.12.2018. Once again, the company is undervalued, but significantly less in terms of percentile difference (only 68%). Of course, it's important to note that the company has 7% less shares outstanding in this period and part of the increase in price

can be attributed to that as well. The ROE and margins have seen a minor increase, ROE = 36%, Net Margin = 10%, EBITDA Margin = 18%. The current liquidity is lower, equal to 0.91. The detailed valuation is shown in the table below:

Table 2. Valuation of International Consolidated Airlines Group SA as of 31.12.2018

International Consolidated Airlines Group SA USD	Market multiples		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	36 624 313 500,00	19 935 003 345,72	25 520 008 946,66
Total Debt	9 835 550 000,00	9 835 550 000,00	9 835 550 000,00
Total Cash on hand	8 152 400 000,00	8 152 400 000,00	8 152 400 000,00
Implied Market value	34 941 163 500,00	18 251 853 345,72	23 836 858 946,66
Shares outstanding	1 990 000 000,00	1 990 000 000,00	1 990 000 000,00
Price per multiple	**17,56**	**9,17**	**11,98**
Weight of each price	40%	40%	20%
Weighed price per multiple	7,02	3,67	2,40
Final price	13,09 USD		

Source: Personal calculations

3.1.3. Valuation based on financial data 7 years after the crash (2024).

For the purpose of the analysis, data as of 31.12.2023 is used. This analysis aims to outline any long-term effects which the IT outage may have had on the company. The valuation provides us with a price of 5.41 USD per share, while the market price is 3.42 per share as of 31.12.2023. It is important to note that the shares outstanding of the company have doubled, therefore significantly dropping the share price. It's interesting to note that the company is once again undervalued but only with 58%. This means that its market price is slowly getting closer to the real price of it. The ROE has increased to 83%, due to the lowering of the shareholders equity, while the margins have remained more or less unchanged, Net Margin = 9%, EBITDA Margin = 19%. The current ratio is even lower – 0.63. The detailed valuation can be seen on the table below:

Table 3. Valuation of International Consolidated Airlines Group SA as of 31.12.2023

International Consolidated Airlines Group SA USD	Market multiples		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	35 126 173 464,96	31 987 683 922,67	30 699 493 035,71
Total Debt	19 635 850 000,00	19 635 850 000,00	19 635 850 000,00
Total Cash on hand	8 309 600 000,00	8 309 600 000,00	8 309 600 000,00
Implied Market value	23 799 923 464,96	20 661 433 922,67	19 373 243 035,71
Shares outstanding	4 000 000 000,00	4 000 000 000,00	4 000 000 000,00
Price per multiple	5,95	5,17	4,84
Weight of each price	40%	40%	20%
Weighed price per multiple	2,38	2,07	0,97
Final price	5,41 USD		

Source: Personal calculations

3.1.4. Conclusion on the first valuation

From the analysis we could see that no significant effect on the value of the company can be derived solely from the effects of the IT outage neither in the short-, nor the long-term. A positive effect can be seen, in which the share price on the market is slowly approaching the real price as per comparison with the market peers. The reason for this can be attributed to a multitude of factors and therefore cannot be connected solely with the effects of the outage. However, it is important to note, that as of the occurrence of this disruption, the company has raised the risk significance of cyber-attacks and data security as well as events causing significant network disruptions, which in itself shows that they have reacted and are actively investing in prevention mechanisms as well as new and improved digital products. This in itself could be counted as an attributing factor to the stability of the company and its further growth. This case is a good example of how an enterprise should react in the event of a similar outage, but it's also important to consider these risks beforehand. It's also important to note that the company affected is not a tech company and therefore there are a multitude of factors, which could compensate a potential IT disruption and its effects. This is evident from the financial ratios as well, as the only one that saw a decrease is the liquidity ratio, while the other saw either a very significant increase in the face of the ROE, or a moderate increase in the face of the Margins. Therefore it's highly unlikely that any changes to the financials were closely related to the IT outage.

3.2. Second case - Alphabet Inc.

The second case is that of Google and the interruption of services provided by it. The company affected is its owner Alphabet Inc. On December 14, 2020, Google's services ceased to function for 1 hour, affecting tens of thousands of users. The first step of the analysis is to look at the company's financial ratios. Google is a tech giant and therefore it's only logical that the analogues will be similar companies. For the purpose of the valuation, the following peer companies are considered: NVIDIA Corporation; Apple Inc.; Microsoft Corporation. All of them are functioning companies, which are selected as peers, as their financial data, size of the business and margins are very similar to those of the affected company. It's also important to note that an IT crash could be detrimental to a tech-based company and this case is especially interesting to be studied.

3.2.1. Valuation based on financial data 1 year before the crash (2019).

For the purpose of the analysis, data as of 31.12.2019 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this valuation will be used as the baseline for the comparison. The first thing to note is that Alphabet inc. has very high profit margins, as do the selected peers. The company's market price as of 31.12.2019 is 66.9 USD per share, while the valuation shows a price of 70.04 USD per share. This is a gap of just 5% between the implied price and the market price, which means that the company is close to being valued at its real price. The ROE is equal to 17.05%, the Net Margin = 21.22% and the EBITDA Margin = 28%. The current liquidity ratio is 3,374. The detailed valuation can be seen in the table below:

Table 4. Valuation of Alphabet inc. as of 31.12.2019

Alphabet Inc. USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	696 193 015 057,19	963 800 710 089,49	1 379 956 924 165,67
Total Debt	15 960 000 000,00	15 960 000 000,00	15 960 000 000,00
Total Cash on hand	119 670 000 000,00	119 670 000 000,00	119 670 000 000,00
Implied Market value	799 903 015 057,19	1 067 510 710 089,49	1 483 666 924 165,67
Shares outstanding	14 902 000 000,00	14 902 000 000,00	14 902 000 000,00
Price per multiple	53,68	71,64	99,56
Weight of each price	40%	40%	20%
Weighed price per multiple	21,47	28,65	19,91
Final price	70.04 USD		

Source: Personal calculations

3.2.2. Valuation based on financial data 1 year after the crash (2021).

For the purpose of the analysis, data as of 31.12.2021 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This period represents 1 year after the IT crash that occurred and interfered with the normal company activity. The image is significantly different than before. The market price of Alphabet Inc. as of 31.12.2021 is 144.7 USD per share, while the value as per the valuation and the peers is 219.35 USD, which is a gap of 51.52%. This shows that the company's value, although increasing, is significantly further from the market equivalent as per the valuation. The ROE has increased to 30%, as have the margins to a Net margin = 29% and EBITDA margin = 34%. The current liquidity ratio is lowered to 2.92. The detailed valuation can be seen on the table below:

Table 5. Valuation of Alphabet inc. as of 31.12.2021

Alphabet Inc. USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	2 587 917 500 000,00	2 682 107 132 668,32	3 427 059 784 964,85
Total Debt	28 395 000 000,00	28 395 000 000,00	28 395 000 000,00
Total Cash on hand	139 649 000 000,00	139 649 000 000,00	139 649 000 000,00
Implied Market value	2 699 171 500 000,00	2 793 361 132 668,32	3 538 313 784 964,85
Shares outstanding	13 242 420 000,00	13 242 420 000,00	13 242 420 000,00
Price per multiple	203,83	210,94	267,20
Weight of each price	40%	40%	20%
Weighed price per multiple	81,53	84,38	53,44
Final price	219.35 USD		

Source: Personal calculations

3.2.3. Valuation based on financial data 4 years after the crash (2024).

For the purpose of the analysis, data as of 31.12.2023 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. This period represents 4 years after the IT crash that occurred and interfered with the normal company activity. This aims to show if there are any long-term effects of the disruption. The image is more or less the

same as it was 1 year after the crash. The market price of Alphabet Inc. is 140.90 USD per share, while the valuation shows a share price of 227.81 USD. This shows a gap 62% between the two prices. Once again, there are many other attributing factors to this, but one of them is also highly likely to be the network crash. The ROE has decreased to 26%, as have the margins: Net margin = 24% and EBITDA margin = 31%. The current liquidity ratio is also lower to 2.09.

Table 6. Valuation of Alphabet inc. as of 31.12.2023

Alphabet Inc. USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	2 419 238 500 000,00	2 618 638 560 403,75	3 704 598 812 461,55
Total Debt	28 504 000 000,00	28 504 000 000,00	28 504 000 000,00
Total Cash on hand	110 916 000 000,00	110 916 000 000,00	110 916 000 000,00
Implied Market value	2 501 650 500 000,00	2 701 050 560 403,75	3 787 010 812 461,55
Shares outstanding	12 460 000 000,00	12 460 000 000,00	12 460 000 000,00
Price per multiple	200,77	216,78	303,93
Weight of each price	40%	40%	20%
Weighed price per multiple	80,31	86,71	60,79
Final price	227.81USD		

Source: Personal calculations

3.2.4. Conclusions on the second case

Alphabet Inc. is a tech giant and as such it is of great importance for its systems to be up and running 100% of the time. Of course, there are maintenance schedules etc., but in the case of an unplanned disruption, it could cost the company significantly. A tech disruption in a company like Alphabet creates several issues, which have a snowball effect. For example, the search engine "Google" is the most used in the world, it also offers an enormous amount of engagement to advertisements. A disruption of this, for multiple hours, creates losses for the company as well as the advertising companies. This in turn could lead to a loss of trust in the Alphabet, which could also lead to losses. All these factors, combined with the fact that 2020 was subject to many crises, it is safe to assume that an IT outage of that scale could prove to be an important factor in the value of the company. This is also confirmed by the company itself, which has stated in its reports that *"Interruption, interference with, or failure of our complex information technology and communications systems could hurt our ability to effectively provide our products and services, which could harm our reputation, financial condition, and operating results."* (Alphabet Inc., 2020). It's also important to note that there is fluctuations in the financial ratios. One year after the outage we can see an increase in margins and ROE, while a lowering of liquidity, while in the long-term the ratios are slowly approaching their starting values as of 2019, but the liquidity keeps lowering. This could be correlated to a number of factors, but there is high likelihood of the company trying to maintain its margins and returns by sacrificing a little liquidity and investing in systems, which could help the business maintain its level and grow even further. This cannot be directly correlated to the IT outage, but there is a possibility, that the company aims to invest to lower the risks of a similar thing occurring again, so it can also be counted as a factor in a way.

3.3. Third case - META

The most recent case study is that of META and the technological failure suffered. The company affected is META. On 04 October 2021, the services of the platforms provided by META, namely Facebook, Instagram, WhatsApp ceased to function for 6 hours. The selected company is also, as in the previous case, a tech giant and therefore the selected peers for it reflect upon that as well. The selected peer group contains: Tencent Holdings Inc., Apple Inc.; Microsoft Corporation. All of them are huge tech companies, similar to META and have very close margins and financial ratios.

3.3.1. Valuation based on financial data 1 year before the crash (2020).

For the purpose of the analysis, data as of 31.12.2020 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results, as this valuation will be used as the baseline for the comparison. In this case it's interesting to note that the market price of META as of 31.12.2020 is 273.16 USD per share, while according to the peers and the valuation it is 273.83 USD per share. The gap between the two is just 0.25%, which is incredibly close. This means that META during this period has had a market price almost identical to the real price as per the valuation. The ROE ratio is 23% and the margins are relatively high at 33% - Net margin and 46% for the EBITDA margin. The current liquidity ratio is 5.05. The detailed valuation can be seen in the table below:

Table 7. Valuation of META Platforms as of 31.12.2020

META USD	**Market multiples**		
	P/E	**EV/EBITDA**	**EV/Revenue**
Implied Enterprise value	627 556 630 954,10	828 086 878 900,46	732 950 243 966,03
Total Debt	10 654 000 000,00	10 654 000 000,00	10 654 000 000,00
Total Cash on hand	61 954 000 000,00	61 954 000 000,00	61 954 000 000,00
Implied Market value	678 856 630 954,10	879 386 878 900,46	784 250 243 966,03
Shares outstanding	2 849 000 000,00	2 849 000 000,00	2 849 000 000,00
Price per multiple	238,28	308,67	275,27
Weight of each price	40%	40%	20%
Weighed price per multiple	95,31	123,47	55,05
Final price	273.83 USD		

Source: Personal calculations

3.3.2. Valuation based on financial data 1 year after the crash (2022).

For the purpose of the analysis, data as of 31.12.2022 is used, which represents a completed fiscal year, in order to maximize the objectivity of the financial results. The analysis aims to show the short-term effect if any of the IT crash of META's systems. The market price of the company as of 31.12.2022 is 122.37 USD per share, while according to the valuation and the market peers, it should be 341.29 USD per share. This is by far the biggest deviation, with an 178% gap between the prices. There is also a notable change in the ROE, which is now equal to 18% and significantly lower margins: Net margin=19.90% and EBITDA margin=32%. The current liquidity ratio is 2.20, almost twice as low as before. The detailed valuation can be seen in the table below:

Table 8. Valuation of META Platforms as of 31.12.2022

META USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	809 453 000 000,00	928 850 525 230,18	913 305 655 846,90
Total Debt	26 591 000 000,00	26 591 000 000,00	26 591 000 000,00
Total Cash on hand	40 738 000 000,00	40 738 000 000,00	40 738 000 000,00
Implied Market value	823 600 000 000,00	942 997 525 230,18	927 452 655 846,90
Shares outstanding	2 614 000 000,00	2 614 000 000,00	2 614 000 000,00
Price per multiple	315,07	360,75	354,80
Weight of each price	40%	40%	20%
Weighed price per multiple	126,03	144,30	70,96
Final price	341.29 USD		

Source: Personal calculations

3.3.3. Valuation based on financial data 3 years after the crash (2024).

The last valuation done is that of META, using data as of 31.12.2023, as a completed fiscal year. This analysis shows an interesting trend. The company has bounced back and has reached the market price, which was implied in the previous period valuation. The market price as of 31.12.2023 is 355.18 USD per share, showing that the company has managed to recuperate. This is evident when comparing with the price per valuation, which is 529.17 USD per share. Although there is once again a gap, it is significantly smaller, only 49%. There is also a bounce back in terms of the ROE, which is now equal to 25% and better margins, nearing those before the IT outage: Net margin=28.9% and EBITDA margin=44%. The current liquidity ratio is 2.67, which has also seen an improvement. The detailed valuation can be seen in the table below:

Table 9. Valuation of META Platforms as of 31.12.2023

META USD	Market multiples		
	P/E	EV/EBITDA	EV/Revenue
Implied Enterprise value	1 136 951 400 000,00	1 581 912 319 503,05	1 197 410 018 304,38
Total Debt	37 234 000 000,00	37 234 000 000,00	37 234 000 000,00
Total Cash on hand	65 403 000 000,00	65 403 000 000,00	65 403 000 000,00
Implied Market value	1 165 120 400 000,00	1 610 081 319 503,05	1 225 579 018 304,38
Shares outstanding	2 561 000 000,00	2 561 000 000,00	2 561 000 000,00
Price per multiple	454,95	628,69	478,55
Weight of each price	40%	40%	20%
Weighed price per multiple	181,98	251,48	95,71
Final price	529.17 USD		

Source: Personal calculations

3.3.4. Conclusion on the third case

The analysis of another tech giant, in the face of META, provides an interesting insight on the topic. During this period, META has also been subject to other issues, once again related to the technical infrastructure of the company, so it's important to note, that there is a sum of factors, which contribute to the financial development and value of the company. Isolating one factor is nothing short of impossible, but similar to Alphabet, all of META's applications and services are digital and therefore the safety and integrity of this infrastructure is extremely important for the company's functionality and well-being. Once again, there is a huge risk for the company's

reputation, as well as its availability to advertisers and other revenue sources, as confirmed by the company's annual report *"Our products and internal systems rely on software and hardware that is highly technical, and any errors, bugs, or vulnerabilities in these systems, or failures to address or mitigate technical limitations in our systems, could adversely af ect our business."* (META, 2023). This is evident from the changes in the margins, the return and liquidity ratios, which are lower after the IT disruption, but in the long-term slowly begin to recuperate and start returning to their base levels as per the basis year.

4. Potential consequences of the latest IT outage on the company affected. Conclusion

The latest IT outage that occurred affected the company CrowdStrike. It is a cybersecurity company, providing services to many big companies, not only in the tech industry, but outside of it as well. They have introduced a special sensor, called "CrowdStrike Falcon" which uses AI and machine learning to protect customer systems by identifying and remediating the latest advanced threats. (CrowdStrike, 2024) The IT crash that occurred on July 19, 2024, is caused by a Rapid Response Content update, which was delivered to Windows hosts. The introduced sensor was prepared to expect 20 input fields, but the update provided 21, which created a mismatch resulting in an out-of-bound memory read, which in turn caused a system crash. The company confirmed that the issue was not exploitable by a third party (CrowdStrike, 2024).

This crash resulted in many different companies losing the ability to function properly. An outage of this severity could prove to be detrimental to any company, let alone being a tech company focused on providing software services to other companies. It is safe to assume, learning from the effects of the previously analyzed cases, more specifically those of Alphabet and META, as tech companies, the outages of which were related to the main activity of the company, it is highly likely that CrowdStrike's market will most likely stray from its real price, as the market will be mistrustful and careful. This will undoubtedly influence the company's reputation and potential ability to generate revenue, as its main source of this was jeopardized and there is a high probability of risk occurrence, which the market will not take lightly. This is evident from the price fluctuations as of the occurrence of this outage (yearly the price ranges from 183.60 USD per share to 398.33 USD per share) (Yahoo Finance, 2024). There is also a high likelihood that the financial ratios of the company and its financial performance will see a decrease in the short-term, but if the reaction of the enterprise is adequate, it will most likely bounce back to levels, similar of those before the crash.

The company has of course introduced preventive measures, which if improved further and deployed in a timely manner, will help improve the company's reputation and help it recover from this issue.

In conclusion the effects of an IT outage on a company's value depend mostly on the company's main sources of income and the area in which it functions. While a tech outage could be detrimental to a tech company, it might not have the same effect on a company which only uses technology as a supporting activity. Of course, it is always a matter of scale as well, as the studied companies are big companies, 2 of which - tech giants, which are staples in the market and could hardly be ruined by a single outage, unlike a small company, which is far from being irreplaceable, where a similar occurrence could prove to be catastrophic for it. We could also see that although an IT outage impeded the normal functioning of IAG's processes, no significant harm was done to the financials, on the contrary, the company's market price was approaching slowly it's true price as per the valuation. There is also a condition regarding the amount of technology being implemented in a company. For example if the entire database of a company is in the digital environment, if it is subject to a breach or an outage, the affected

enterprise might not be able to function at all ever. There are many factors, which could increase or decrease the effect of these disruptions and it‘s not possible to calculate an exact amount a similar occurrence would have on different individuals. However, it’s important to note that all companies should integrate preventive measures when using technology in any form, in order to prevent potential risks to its reputation, financials etc. This is especially important for tech companies, as seen in the analysis, even tech giants could have difficulties recovering from a similar event in the short-term.

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