ICT INDUSTRY IN NORTH MACEDONIA

GENERAL MAPPING REPORT

Skopje, North Macedonia | **June 2020**

This report is prepared by Insider ID and Target Group for the needs of MASIT, with the financial support of the Swiss Agency for Development and Cooperation – SDC, through the Increasing Market Employability Program – IME. The views and positions expressed in this report do not necessarily reflect views or positions of the donor.

IME – INCREASING MARKET EMPLOYABILITY

The Increasing Market Employability Programme – IME Works toward strengthening the business sector in the Republic of North Macedonia and creating an enabling environment for three target sectors: Sustainable Agriculture, Adventure Travel and Information and Communication Technology (ICT). This is achieved through boosting competitiveness amongst domestic players in these sectors, catalyzing an overall improvement in the quality of products and services, and creating sustainable jobs for high-skilled labor force in North Macedonia, especially women and youth.

For more information: www.ime.org.mk

MASIT

The Chamber of Commerce for Information and Communication Technologies – MASIT represents the Macedonian ICT Industry and promotes and represents the business interests of ICT companies in order to promote and develop the ICT industry and business environment. The Chamber represents companies operating a wide range of ICT products and services in North Macedonia and since its establishment in 2000, as a non-profit and voluntary institution, has provided its member companies with access to information, education, legal advice, cooperation, networking and promotion at domestic, regional and international levels, with the aim of advancing and developing the ICT Industry.

For additional information please visit www.masit.org.mk

Ordered by:	MASIT
Prepared by:	Insider ID Ltd. (www.insider.mk) Target Group Ltd. (www.targetgroup.mk)
Financed by:	Swiss Agency for Development and Cooperation – SDC, through the Increasing Market Employability Program – IME
Project Manager:	Sergej Zafiroski (sergej@insider.mk)

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

ICT INDUSTRY REPORT IN NORTH MACEDONIA

CONTENT

TABLE OF CONTENTS

EXECUTIVE REPORT

X. ICT INDUSTRY REPORT IN NORTH MACEDONIA

X1. EXECUTIVE SUMMARY

X. EXECUTIVE SUMMARY
X. GENERAL ICT INDUSTRY ASSESSMENT

Currently, there are 1,957 economically active companies in the ICT Industry, which generate a total of 879,65 million euros in revenue, 792.48 million expenses, and 118.65 million net-profit. There is a high probability that in the next 2 years the revenue will reach nearly 1 billion euros and 134 million net-profit. Most of the companies or 56% of the total are concentrated within the "Software and IT Services" subsegment and 27% in "ICT Trade and Manufacturing". From the projection, the total number of economically active companies will reach 2,390 or growth of nearly 15% compared to 2019.

The industry is employing a total of 15,093 individuals with total employee-related expenses of 199.69 million euros (gross salaries) and 138.33 million in net salaries and salary allowances. It is expected that in the next several years the number of employees to grow up to 17,676. The average number of employees per company is 7.46 with a possibility to decrease soon to 7.17. If the intensity for start-ups and new companies intensifies, and there is no solution for the educational (supply) problem, in the next few years, the total number of employees may grow even faster but the average will decrease even more.

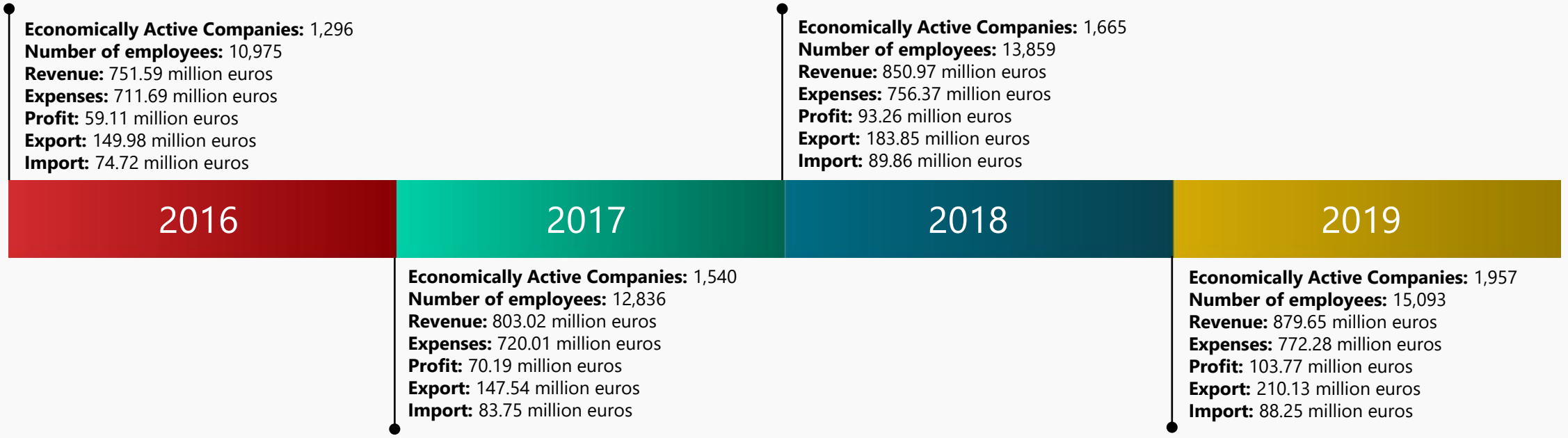
From the employee-related indicators, the average revenue per employee in 2019 was 58,884 euros down from 68,482 euros and with high probability, it will continue to decline to 52,522 until 2021. On the other side, the average expenses per employee are 51,168 in 2019 and they are also down from 64,846 and will continue, reaching 43,448 euros. Even in a period when the average revenue and income are declining, the average net-profit is growing from 5,386 to 6,875 between 2016 - 2019 and probably will continue to grow to reach 8,000 euros in 2021. The average employee-related expense (gross salary) per employee are between 12,048 and 13,966 in the same period with the projection to 2021 included. Considering that the wage-related expenses (healthcare, insurance, etc.) are on average 47% of net-salary, subtracted from the previous gross salary, the calculated average Net-Salary in the ICT Industry is ranging from 7,526 euro to 8,242 euro or 627 euro to 686 euros from 2016 to 2019.

The companies within the ICT Industry are divided in 5 subsegments or Software and IT Services, Telecommunication, ICT Manufacturing, ICT Trade and Other IT Services. The main IT subsegment which has the biggest accent of analysis and impact of the whole ICT Industry is "Software and IT Services" which has significant results in the analyzed period, outperforming nearly every industry and segment especially with the employee related financial results offering the biggest salaries and employing nearly 8,500 individuals by 2019.

Analyzed separately, IT Segment has the most significant growth (in absolute value and relative growth rate) compared to the Telecommunication segment. IT has grown from 60 million in 2014 to 179 million in 2019 or nearly 200% in a 6-year period, with an average pace of 28%. If the growth continues with the same rate, it can be expected that till 2021 the exported volume of IT Services will be above 278 million euros. From the average import/export growth rates, the export of IT Services has an average growth of 25% from 2015 – 2019 and the import 13% in the same period. Telecommunication on the other side as part of the ICT Industry Segment has a constant decrease of the export from 60.89 to 22.58 million euros and an average pace of -15% per year.

Until today 2019/20 the Macedonian ICT Industry has impressive results even with low institutional support. The export is growing continuously from 121 million euros in 2014 to 210 million euros in 2019, but more impressive is the growth of export in the IT segment from 60 million euro to 179 million euros in the same period. The ICT Industry is accounting for significant trade surplus of 121 million euros by 2019 out of the 121 total for the ICT Industry. If the trend continues with the average growth of 25% of the IT Segment in the next few years will reach nearly 300 million euros. Also, 63% of the total value (generated revenue in 2019) of the IT Segment is exported and only 23% imported with share of the trade surplus of 41% which again is highly positive.

X4. GENERAL ICT PERFORMANCE



DETAILS: GENERAL ICT PERFORMANCE

CONTENT

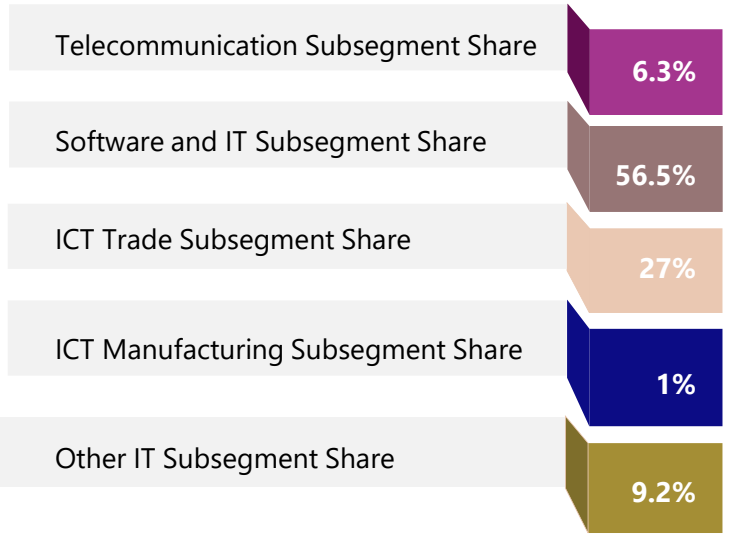
X. EXECUTIVE SUMMARY
X5. ACTIVE COMPANIES

From the official statistical data, there are 2041 active (by law) business subjects in the ICT Industry (without the trade and manufacturing) with a 3% share in the total number and average growth of 6.75%. By the data from the Statistical Bureau, the ICT Industry is ranked on the 10th position by the number of active business subjects out of 19 in total. The growth is on 4th place among all other industries, just behind "Art, entertainment and recreation" with 8.46%, "Electricity, Gas, Steam and air conditioning supply" with 8.38% and "Other services" with 7.59%. But according to the economically active companies which have revenue above 1 euro, there are 1,957 companies economically active by 2019 up from 1,296 in 2016.

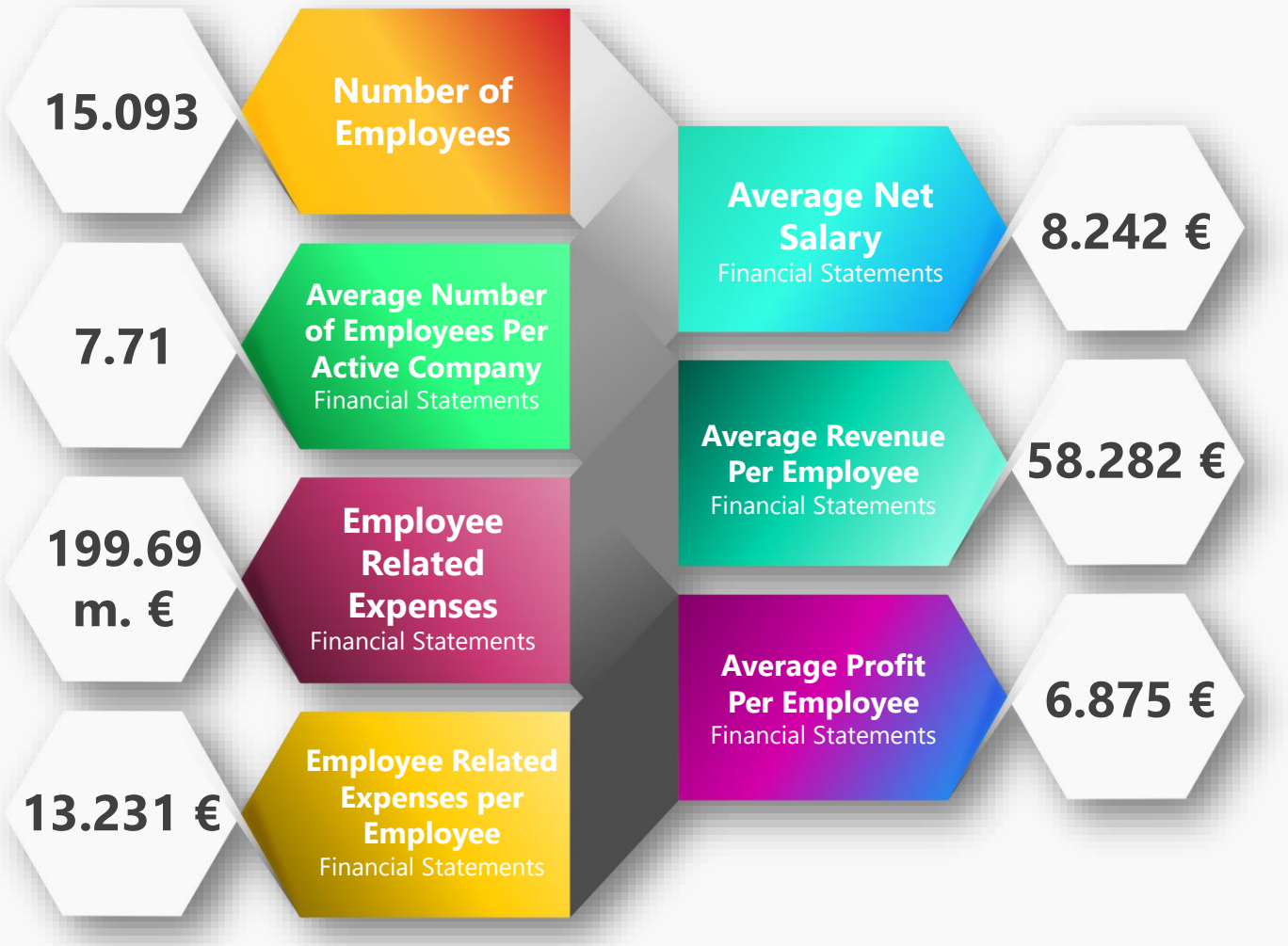
In details, most of the companies in the ICT Industry are concentrated in the "Software and IT Services" subsegment or 56.6% of the total number. The two sectors within the Software subsegment, "Computer Programming..." and "Other information...." have a significant combined share of 44% in total number of economically active companies in the ICT Industry. In a matter of fact, the same subsegment has the largest growth of economically active companies of nearly 400 in a 4-year period, and from the later projections, they will grow even faster in the next period. The second subsegment with a share of 27% is "ICT Trade" in which there is no dominant sector, or all of them have a fair share in the total number of companies.

The segment which has the highest revenue and profits from all within the Industry is "Telecommunication" which has a share of 6.3% of the total number of companies. The most interesting part is that the largest revenue (312 million euros) is produced by 1.2% of the companies in the "Wireless telecommunication activities" which is expected. Although this subsegment doesn't have a large share in the number of companies, it has a very high impact on every aspect of the ICT Industry from revenue, expenses to profit and overall performance.

The last two subsegments are "ICT Manufacturing" with 1.0% and "Other IT" with 9.2%, while most of the companies in "Other IT" are concentrated in "Web portals" with 6.2% in the total number of companies.



X6. EMPLOYEE RELATED PERFORMANCE



EMPLOYEE RELATED PERFORMANCE
Short Conclusion

To have a better overview and comparison of the segment, all financial indicators as revenue, expenses, and profit are brought down on a single employee level. The results are showing that there are several different trends which should be observed and analyzed. With the huge expansion of companies (51% growth 2016 – 2019) and limited growth of supply of qualified workforce, start-up endorsement activities, the average number of employees per company is expected to decline from 8.47 to 7.71 by 2019.

The revenues and expenses per employee are also decreasing with the serious growth of the number of companies and employees within the industry because now the income is dispersed. The revenue has dropped from 68,482 euros to 58,282 euros per employee between 2016 and 2019 and probably will continue so down to 52.322 until 2021.

The Expenses on the other side, are dropping at a higher rate than the revenues, which is positive because there is probability that the companies are optimizing their activities and allowing them to have higher net-profit (which is the case). Even so, the employee related expanses are rising and having even higher share in the total expense structure.

The "Average Profit per Employee" as mentioned before is the most positive indicator that can be seen growing for 26.5% between 2016 – 2019 from 5,386 euros in 2016 to 6,875 euros by 2019 and if the trend continues in future it will reach 8,006 euro.

For detailed info click the link in the right corner.

X. EXECUTIVE SUMMARY
X7. SIMULATION FOR ADDITIONAL REVENUE

SIMULATION FOR ADDITIONAL REVENUE
Short Conclusion

To emphasize the importance for development and structural support of the "Software and IT Services" subsegment, a simple projection for answering the question "What is the added value of additional revenue of 1-million-euro in the analyzed segments?" is created. It is based on the calculated shares of the expenses and employee-related expenses in total revenue from the report. The most important information is the additional number of employees could potentially be employed if the segment receives an additional 1 million in revenue and how much income would be generated for taxes (personal and corporate tax).

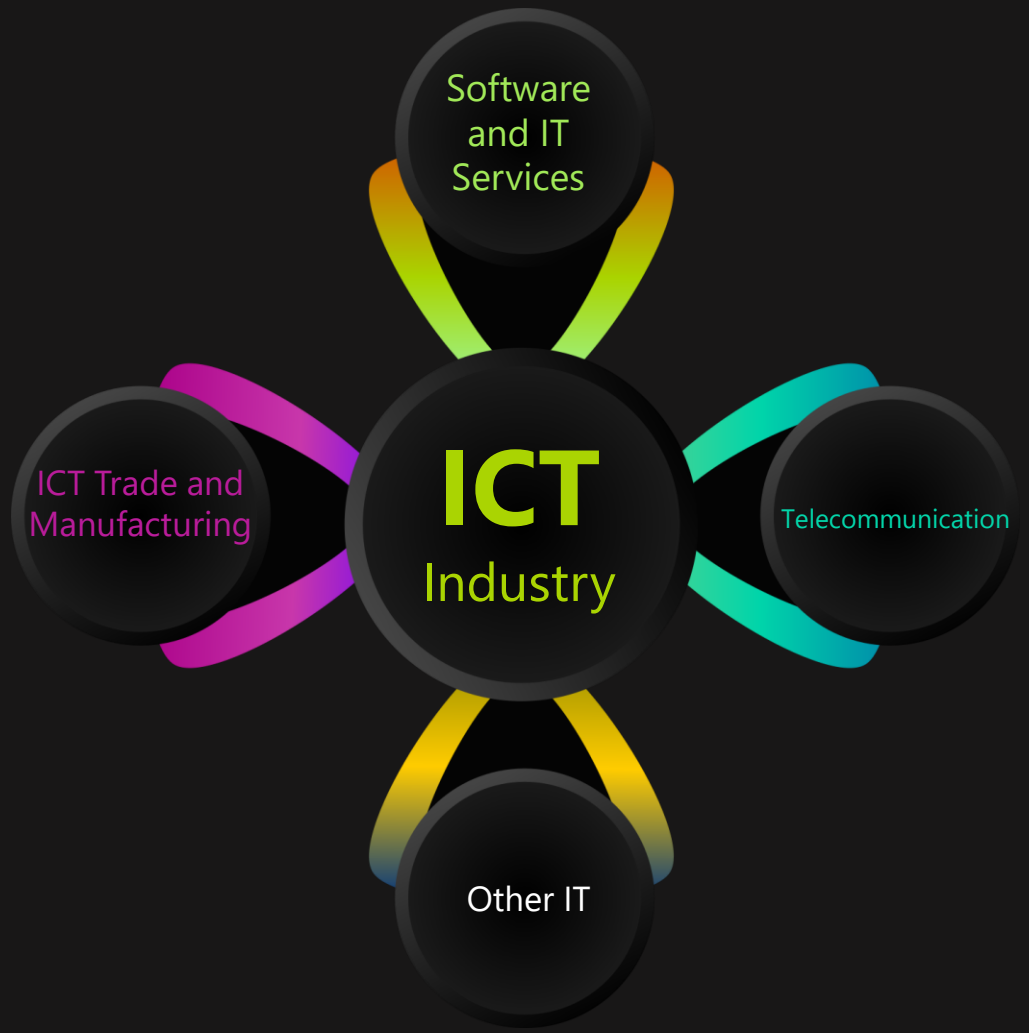
From the projection, there is a significant difference between the "Software and IT Services" and the other two segments. If additional 1-million-euro revenue is generated in the "Software and IT Services" subsegment it will allow potential employment of 31 new employees with the current average salary (employee-related costs) which are as calculated 22% higher than the ones in Telecommunication or 110% compared to "Trade and Manufacturing". The same income in the "Telecommunication" segment will produce an additional 9 new employees and 12 new employees for "Trade and Manufacturing". For each additional 1 million revenue, "Software and IT Services" is generating nearly 200% more additional positions than other segments and industries which is highly positive.

For details and full calculation about the simulation click the link below.

What is the added value of additional revenue of 1-million euro in the analyzed segments?

	SOFTWARE AND IT SERVICES	TELECOMMUNICATION	IT TRADE & MANUFACTURING
Total expenses	845,659 €	866,993 €	932,947 €
Employee related expenses	476,653 €	111,481 €	88,548 €
Employee related expenses per employee	15,280 €	12,563 €	7,218 €
Newly generated working positions	32	9	12
Expected TAX (Corporate and Personal)	47,859 €	20,884 €	12,726 €
Compulsory Social and Other Employee Related Expenses	128,731 €	30,108 €	23,915 €
Total State related expenses	176,590 €	50,992 €	36,641 €

X. EXECUTIVE SUMMARY
X8. GENERAL SUBSEGMENT ANALYSIS



The ICT Industry is composed of four main subsegments and the analyzes showed that "Software and IT Services" subsegment is leading the growth of active companies with 55% comparing 2019 to 2016. The subsegment "Other IT" which includes the sectors of "Web portals" and "Repair of computers and peripheral equipment" has also an impressive growth of 300% with what they are outnumbering the "Telecommunication" segment. As expected, the "IT Trade" subsegment is also consistent with a large number of active companies reaching 529 in 2019.

As earlier mentioned, the "Software and IT Services" subsegment is by far the largest employer with 8,478 or more than 5,000 from the second "Telecommunication" segment with 3,307 employees. On the third position is IT Trade with 2,570 in 2019. If the trend continues, the "Software and IT Services" subsegment will employ more than 10,700.

One of the most important financial indicators is "Expenses related to Employees" and its trend, because that's the number of financials which is available for the private expenditure of the employees, and the amount the state is getting trough taxation and other related costs. Even in 2016, where the "Software and IT Services" subsegment is third by revenue and expenses, expenses related to employees are the first with 66.8 million versus the 39.2 million of Telecommunication. 48.5% of the total expenses in "Software and IT Services" are employee-related compared to the 11.6% in Telecommunication (Employee Related Expenses/Total Expenses).

The Net-Margin is growing for nearly every subsegment (with different rates). The largest is accounted for in "Software and IT Services" which will reach 16.5% in 2021 if the trend from 2016 to 2019 continues. Significant growth could be also observed in the Telecommunication segment from 7.6% in 2016 to 12.5%, potentially reaching 15.7% by 2021.

In continuation of this executive summary, a detailed analysis of the subsegment's performance is presented.

X. EXECUTIVE SUMMARY

X9. SUBSEGMENT SOFTWARE AND IT SERVICES

SOFTWARE AND IT SERVICES
Short Conclusion

In 2019 there are 1,234 registered companies from which 1,108 are active with income above 1 euro. The active number of companies has exceptional growth with 55% between 2016 –2019 or average growth of 16% in the same period.

The total revenue in 2019 is 272 million euros with a growth of 80% (2019 compared to 2016) and average growth of 22.4% (2016-2019). The total Expenses were 230 million euros in 2019 with a growth of 69% and an average growth rate of 19%.

The difference between the growth of the Revenue and Expenses of 11% is positive because it means that the companies are optimizing their activities and Expenses and thus, if the trend continues in future, higher profit and available financials for future development and investment.

The growth of the net profit is following the growth of the operating income, from 17.33 million in 2016 to 41.91 million euro in 2019, and average Net-Profit Margin from 12% – 15%.

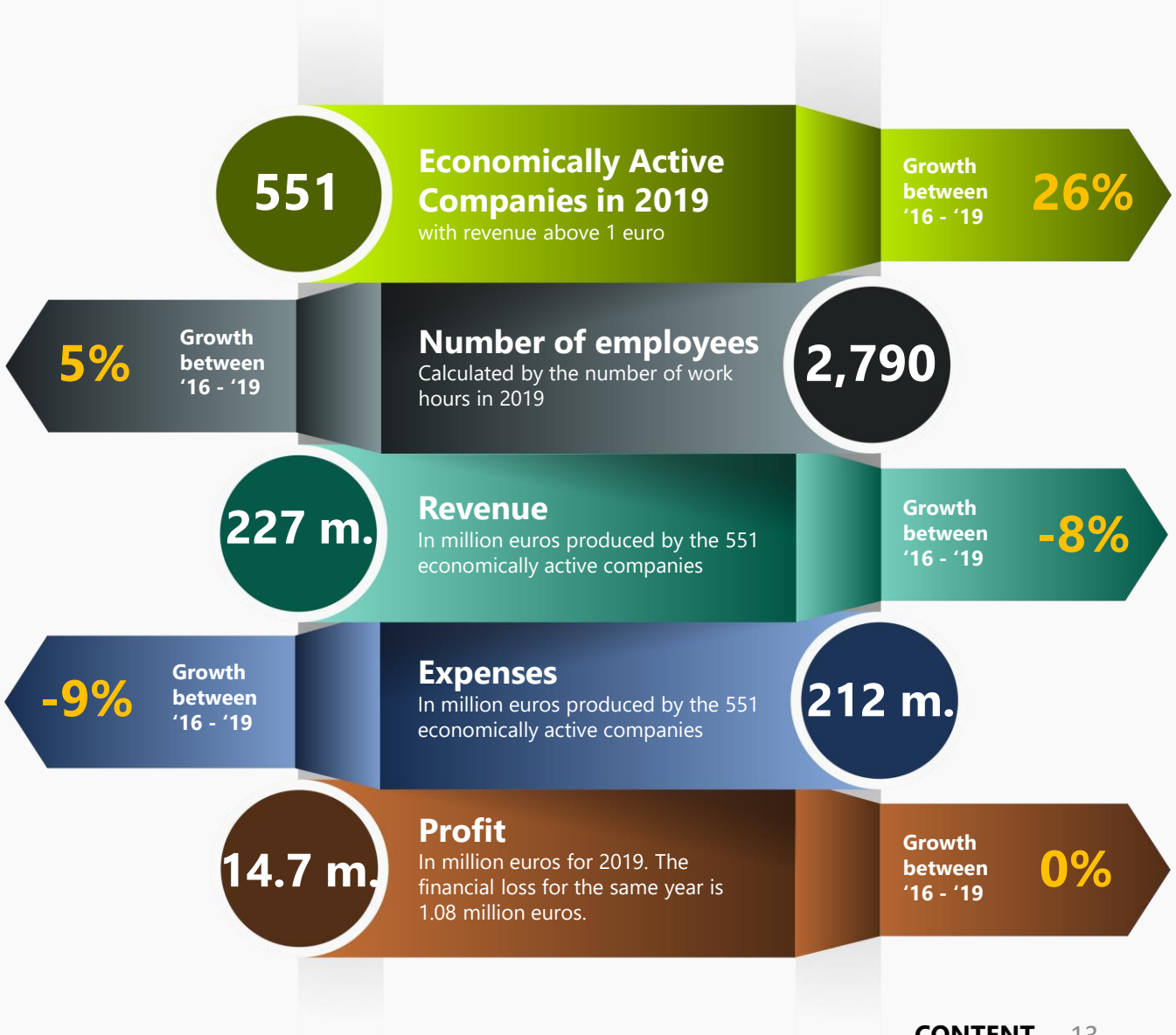
ICT TRADE AND MANUFACTURING
Short Conclusion

The second subsegment consists of the companies which are doing business in IT Trade and IT Manufacturing. The comparative specific is that is more capital intensive because investments in equipment, inventory, and other assets are needed, compared to "Software and IT Services" where the assets are mainly the employees.

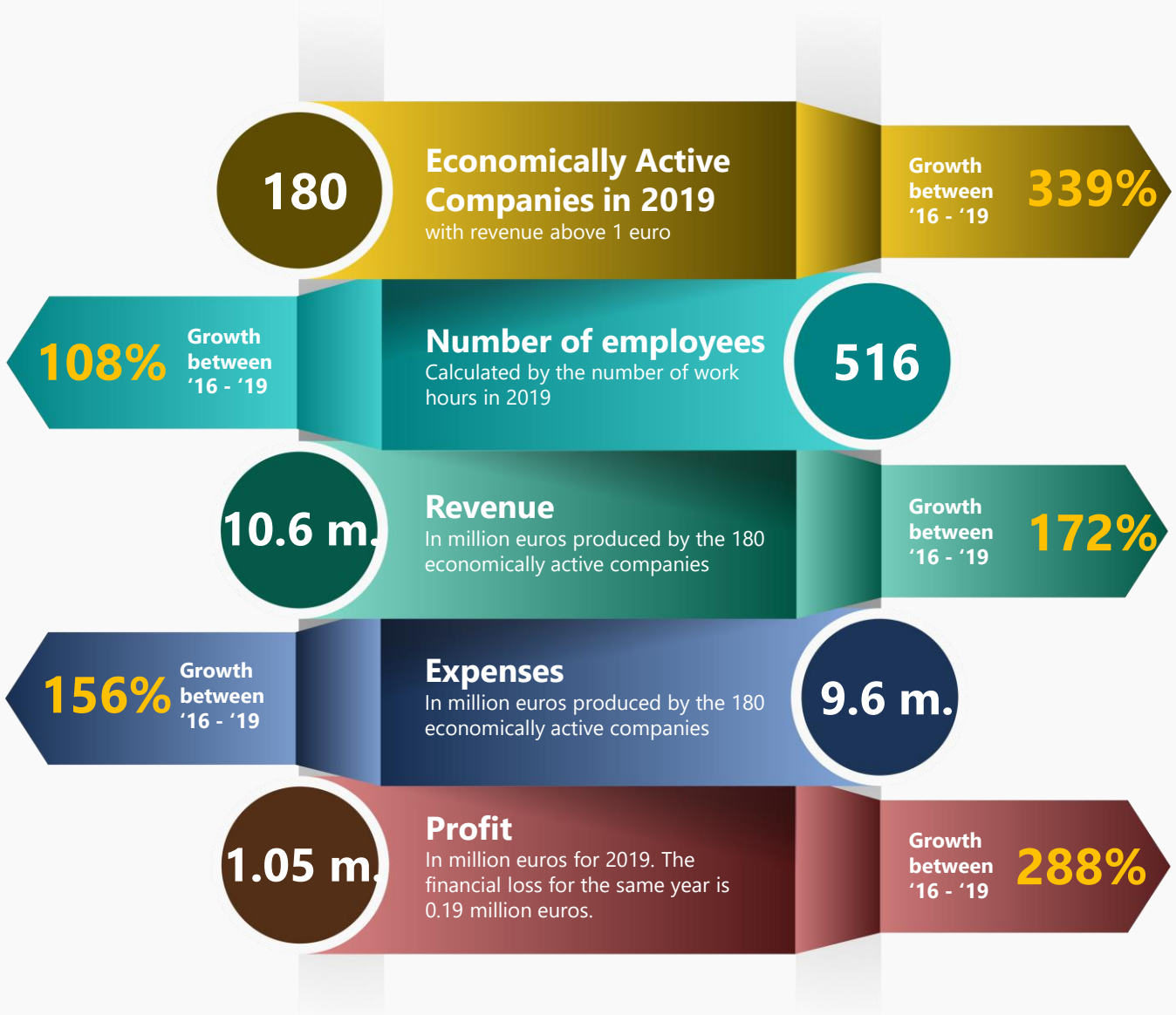
In 2019 there were 551 economically active companies (income above 1 euro) up from 438 in 2016, with general growth of 26% and average growth of 8% between 2016 and 2019.

Nearly, all financial indicators are suggesting that the companies in the analyzed subsegment are lacking behind the ones in "Software and IT Services", because the revenue is decreasing, the operating margin is not high also as the net-profit, and fluctuation in the workforce where there is no visible and directed trend.

Note: the indicators for 2019 are more complex to analyze because one of the largest retailers in North Macedonia closed its stores, and the other one changed the primary income code, thus they are not included in the analysis. For this sub-segment, the employee-related indicators are more relevant to observe and analyze.



X11. OTHER IT SERVICES



OTHER IT SERVICES
Short Conclusion

The analysis will be only general because there are very few companies. The number of employees is growing continuously from 248 in 2016 to 516 in 2019 and it is noticeable that even the number of active companies has grown for 339% the number of employees "only" 108% in the same period.

The revenue of 10.6 million euros in 2019 for subsegment with a small number of companies and the number of employees is significant up from 3.90 million euros in 2016. The expense on the other side are growing from 3,77 million to 9.65 million euros from 2016 to 2019.

The Net-Profit is growing from 0.27 million in 2016 to 1.05 million euros in 2019 which is positive, reaching nearly 10% Net-Profit Margin. Because the values of the basic indicators have high fluctuation, the indicators per employee are maybe overestimated or underestimated, but several trends can be observed.

TELECOMMUNICATION
Short Conclusion

The "Telecommunication" currently is largest by generated revenues and expenses, and second by the number of employees behind "Software and IT Services". It's expected the number of companies to be lower compared to other segments, wherein 2016 there were 104 economically active companies growing up to 123 by 2019 with total growth of 18% or 19 companies.

Even the number of companies is small, the total revenue is significant reaching 368 million euros in 2019 up from 348 million in 2016 with 6% total growth and 2% average yearly growth in the same period.

On the expenses side, they reach 336.59 million in 2016 and are decreasing on 319 by 2019. The decrease is potentially caused by the optimization of the processes within the companies other than employees because the revenue is growing, and the number of employees is nearly stagnant together with the employee-related expenses in the same period.

The Net-profit is growing from 26 million in 2016 to 46 million in 2019 growing 74% or an average of 21% per year

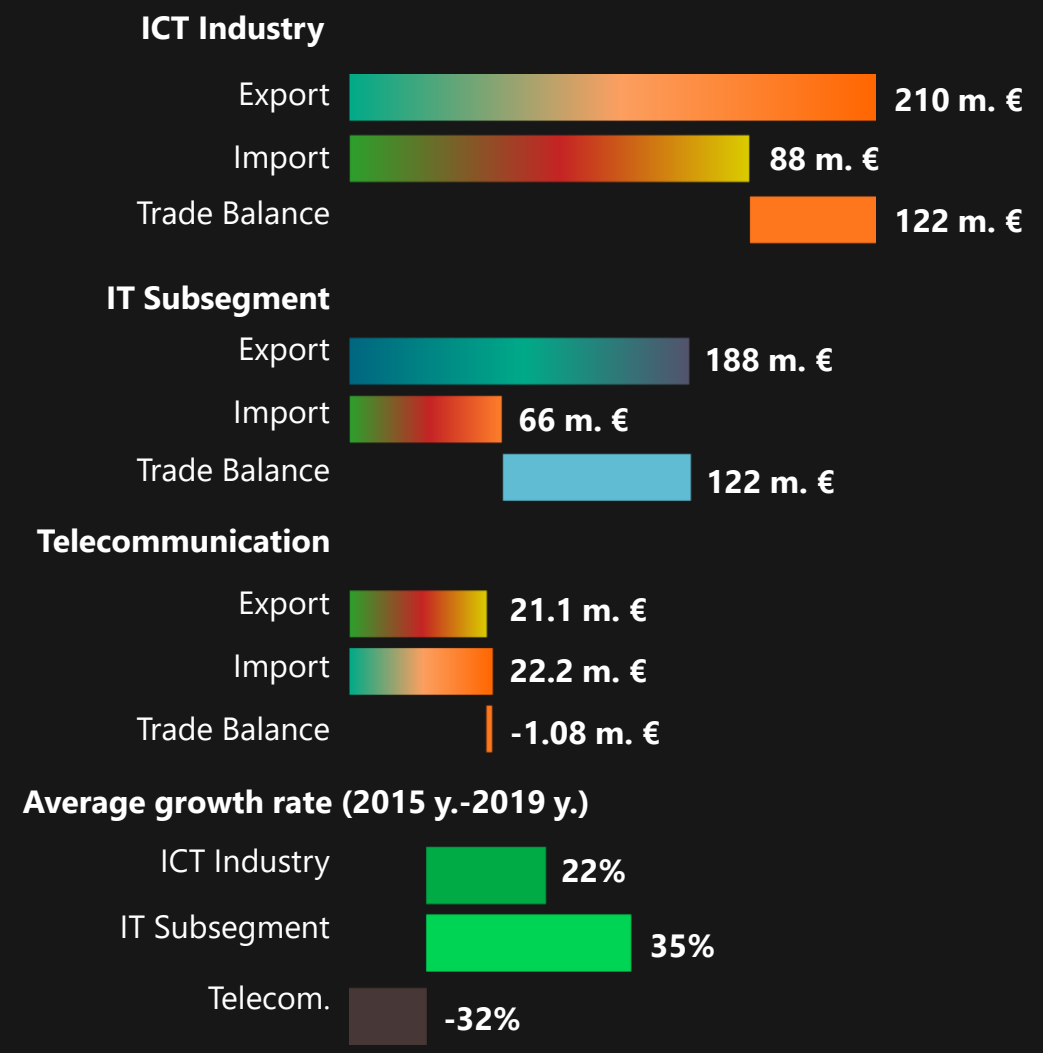
X. EXECUTIVE SUMMARY
X13. TRADE BALANCE OVERVIEW

TRADE BALANCE
Short Conclusion

The whole ICT Industry has been growing from 121 million euros in 2014 to 210 million or 73% growth by 2019 with a 5-year period with an average rate of 11%. On the other side, the import is growing at a lower rate or an average of 8%, or the export is growing significantly higher (in absolute and relative numbers) than the import, thus in the next several years, the trade surplus will be even higher.

Analyzed separately, IT Segment has the most significant growth (in absolute value and relative growth rate) compared to the Telecommunication segment. IT has grown from 60 million in 2014 to 179 million in 2019 or nearly 200% in a 6-year period, with an average pace of 28%. Telecommunication on the other side as part of the ICT Industry Segment has a constant decrease of the export from 60.89 to 21.18 million euros and an average pace of -15% per year. The import in most of the analyzed years is between 22.2 – 44.2 million euros, with one peak in 2015. Because there is no clearly expressed trend, the export could be higher for several percent points than the one projected, because in the last 6 years it didn't fall below 10 million per year. The import and export rates are fluctuating highly for the Telecommunication segment and again there is not a pronounced trend.

In the IT Subsegment, the average growth rate of the trade surplus was 35% in the last 6 years, reaching the highest 45% in 2016 and the lowest 10% in 2019 (compared to 2018) and for telecommunication the average growth per year is –32%, but it should be taken with caution because the oscillations are too high to make a certain conclusion. Generally, the ICT Industry had an average growth rate of 22% per year in the period between 2015 – 2019.



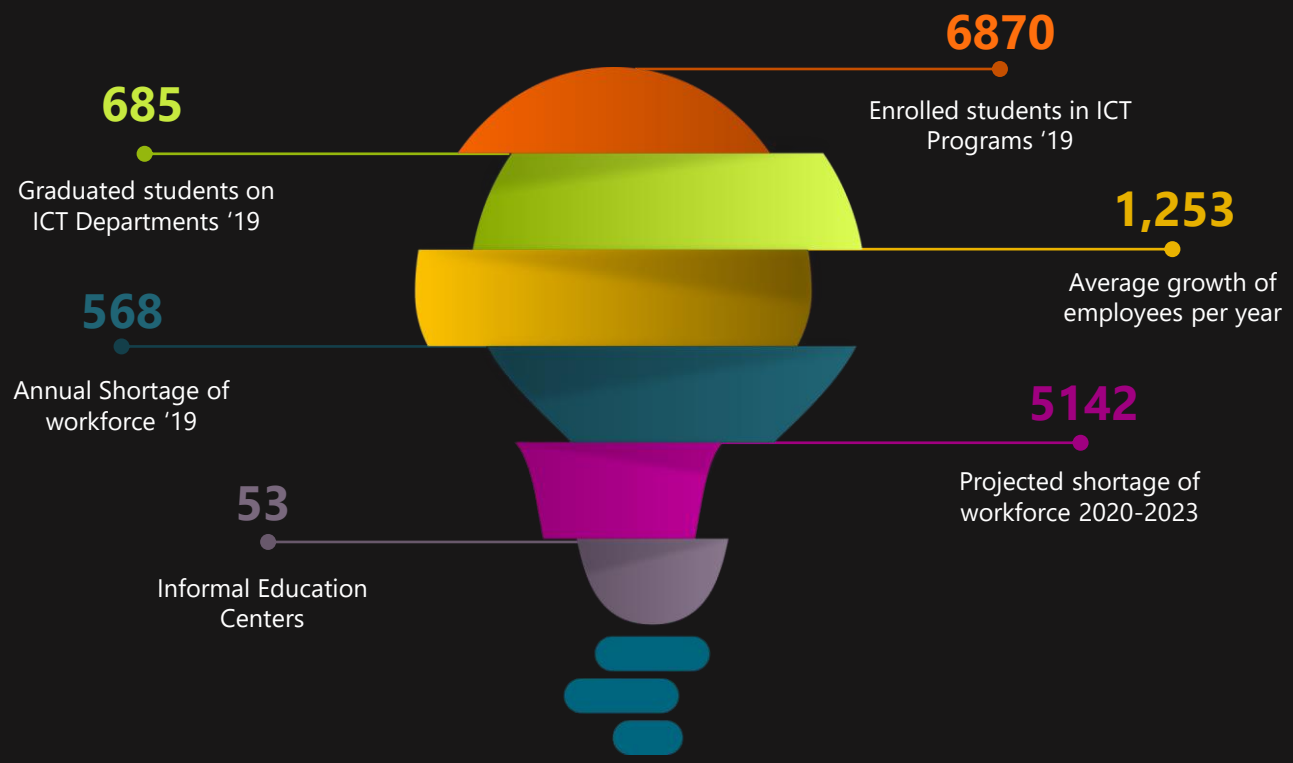
X. EXECUTIVE SUMMARY
X14. ICT AND EDUCATION & WORKFORCE SHORTAGE

ICT AND EDUCATON & WORKFORCE SHORTAGE
Short Conclusion

Depending on the seriousness of the situation with the lack of workforce, detailed projection is made in the main report to estimate how the shortage trend in the next few years would progress and how many employees will be needed.

In 2019, the shortage is 568 employees because the employee growth is 1,253 and the number of graduated students is 685. With each passing year the difference between the supply and demand will be even greater reaching 5,142 in just 5 years from today.
This number may seem high, but the projection is made only for the "Software and IT Services" subsegment. There is also huge demand for IT experts in Telecommunication, Marketing, Sales, or nearly every company that has software also has the need for IT Person at least for maintenance.

If the average expenses per employee in 2019 in the "Software and IT Services" segment was 15,280 euros, the shortage of 568 employees is causing potential loss of 8.67 million euros per year as net-salaries, state tax etc.



X. EXECUTIVE SUMMARY
X15. RECOMMENDATIONS FOR THE FUTURE

RECOMMENDATIONS FOR THE FUTURE
Short Conclusion

From all information in this report, several suggestions for improving the ICT Industry and overcoming its obstacles could be proposed. It's very important to consider the "Bigger Macroeconomic Picture" to analyze the impact which the enhanced ICT Industry especially the improved "Software and IT Services" would have on the Macedonian economy.

There are three defined segments in which improvement is needed to be addressed in near futured, Improving supply of qualified workforce, Creating National ICT Strategy for Internationalization and Taxes and Governmental Regulations for improving the Business Environment. Those three activities are interrelated, thus solving one issue do not guarantee success.

Improving supply of qualified workforce. The shortage of nearly 600 IT Professionals per year or estimated 5,000 in the next 5 years will disrupt the whole Industry. This is the main issue all stakeholders should address and create national education strategy. There are few possibilities as development of informal education centers, formal education or combination.

Creating National ICT Strategy for Internationalization. Because the IT Export is highly effective not only for the segment itself, but also national issues as trade deficit, low wages and employment, there should be national strategy for internationalization. Just to empathize the importance of the export, additional 1 million euro in IT Segment is divided on 630,000 euros export, 230.000 euro which is creating roughly 400,000 trade surplus.

Taxes and governmental regulations for improving the business environment. The most sensitive part of all recommendations for the future are the taxes and other regulations because they should finance the education and internationalization. This suggestions are divided on personal and corporate tax reliefs and limiting the base on which compulsory and employee related expenses are calculated.

EXECUTIVE REPORT

X. ICT INDUSTRY REPORT IN NORTH MACEDONIA

X2. RECOMMENDATIONS FOR THE FUTURE

X. EXECUTIVE SUMMARY

X2.1 RECOMMENDATIONS FOR THE FUTURE

From all information in this report, several recommendations for the ICT Industry and overcoming its obstacles could be proposed. It's very important to consider the "Bigger Macroeconomic Picture" to analyze the impact which the enhanced ICT Industry especially the improved "Software and IT Services" would have on the Macedonian economy. First and foremost, the improvement will solve part of the most "painful" issues which the country is facing as unemployment, negative trade balance, and low wages. Also, it can positively address the issues which are pointed out by international institutions about the Macedonian economy. The bottom line, Investing in development especially of the "Software and IT Services" subsegment will enable countless benefits. Still, even with very clear historical data that unequivocally points out that this segment is the future and it is highly beneficial for the country, very few measures are implemented to enhance its position. In a matter of fact, the companies are struggling with basic issues as the availability of employees and education, lack of support for internationalization, etc.

At the same time, the neighboring countries especially Bulgaria and Romania, are going forward with high-level strategies and institutional support for the ICT Industry. They are supporting the Industry trough TAX regulations, education, and other kinds of measures and most importantly they will continue to develop them on new levels. In the future, the gap will deepen between our domestic economy and them. If North Macedonia doesn't make the necessary strategy and steps, it will lose the competitive advantage and the potential for taking part in this global game. The big clients and projects (in most cases) are not focusing on investment in a specific state in the Balkans, but they scan all potential countries and invest in the one that has the best performance.

Creating vast and complex strategies is a very positive input, but from a practical point of view, very few activities are implemented, or they are all implemented partially so the effect is not noticeable. In short term addressing only one issue will focus the attention of all stakeholders and that will bring results and benefits. That way of organization of activities will gain the trust of all stakeholders for developing and even more importantly will provide active involvement for creating the long-term and more complex strategies.

Other issue that is disrupting the industry, is that the Government and all institutions are highlighting the need of entrepreneurs and start-ups especially in the IT Segment, but on the other not solving the educational (supply) issue, is creating even more problems for the currently active companies than its solving.

There are no official statistics about the number of Start-Ups (they are not even officially classified) but from one research related to entrepreneurship conducted from Insider ID*, above 80% of the youngsters' bellow 35 years have the desire to open up a business mostly in the IT or service-related industries. If nothing is done about the shortage of staff, forcing the entrepreneurship can create even more unstable environment, where the companies won't be able to balance between **their own needs of revenue and profit versus the workforce needed to deliver the projects.**

It is very important to stress that the current barriers for IT Segment development are not external but internal, within the Macedonian economy. From the conducted research**, the companies are requesting institutional support for export, qualified workforce, better education, or segments which are internal and controlled by the Macedonian institutions.

From the consultants' point of view, the focus should be in improving (or creating) the following three segments on mid-term (one supportive) or the next 3 – 5 years:

1. Improving the supply of qualified workforce;
2. Creating National ICT Industry strategy only for support of internationalization for companies in "Software and IT Services";
3. Taxes and Government Regulations for Improving ICT Business Environment;

Before explaining the proposed activities, several details from the report should be mentioned. The growth of companies, revenue, and employees in the "Software and IT Services" is very stable and positive. The share of employee-related expenses in total revenue is on average 47%, which is confirming the fact that they are the most valuable asset. The employees in "Software and IT Services" are the highest paid of all Industries. With 1 million euros additional revenue in the same segment 31 new job positions are created, compared to 9 – 10 in "ICT Trade and Manufacturing" and "Telecommunication". The average revenue growth of "Software and IT Services" is between 30 – 45 million between 2016 and 2019 with a high probability to continue at the same pace.

Also, the "natural" growth of the number of employees is on average 1,200 per year compared to the 560 graduated students from IT-related faculties. From the companies in the "Software and IT Services" subsegment, 75% are facing a lack of qualified workforce, from which nearly 50% are solving the problem with offering internships from Formal Education and 29% from Informal Education.

Research Details: ICT Export 2020 Report

*** Research:** Entrepreneurship in North Macedonia – Insider ID Ltd. 2019
**** Research:** ICT Export 2020 Report

X2.2 RECOMMENDATIONS FOR THE FUTURE

IMPROVING THE SUPPLY OF QUALIFIED WORKFORCE

From the analysis, it could be observed that there is a chronic deficiency of workforce and such a trend is influencing every other aspect of the industry. If there is an insufficient number of employees, the company is unable to work on a larger number or larger projects or both, thus the company is losing the opportunity for higher revenue, higher expenses, higher salaries, etc. And that is a circle which is "very expensive" not only for the company itself but the economy as well. To successfully solve this issue, changes should be made in the whole ecosystem to stimulate the companies to invest in education and development not only for their current employees but the potentials in the future.

By 2019, the natural growth of the number of potential employees in the "Software and IT Services" is above 1,200 per year in the past 4 years, but on the other side, the number of graduated students is not even 600 (the numbers before 2019 were even lower), so the industry every year has a 50% deficit for a qualified workforce, or explained on even more simple way, 1 of 2 years is completely without new potential employees. And that is only for one subsegment of the ICT Industry. Today, nearly every company needs at least a support from IT Specialist, most of the companies in the service industries are employing them to enhance their own industries, so that is directly suggesting that the lack for IT experts is even more chronic than it is on first sight reaching (from unofficial estimation) nearly double than it is initially calculated.

From the consultants' point of view, forcing the ICT Companies to grow their revenue without creating a stable supply of their biggest asset or workforce is unsustainable. Even only with constant and steady supply of workforce, this industry will significantly improve its performance. Also, it must be stressed that the burden for developing the IT Segment is not only on the government and its institutions but also on the economic chambers, educational centers (informal and informal), and most important on the companies themselves. If there is no strategic (not just day-to-day) cooperation between the stakeholders, the success is not guaranteed. There are four alternatives available for the ICT Industry and what could be done (or not) for overcoming this very important issue.

Also, the economic chambers of commerce especially MASIT should be the catalysator for such an improvement because it could easily communicate with all stakeholders and organize the activities and tasks which are required for this strategy to succeed.

The first alternative is not doing anything and continue using the current strategy. With the growth of the number of companies, the average number of employees per company will fall to the degree where every IT person will own a company, the projects will be reduced same as the teams, the number of lost projects higher, the deficiency for workforce even more chronic. In this alternative, the neighboring countries will try to use this situation in their benefit, trough outsourcing their activities on Macedonian companies or even employing them. The Macedonian "Software and IT Segment" would become unattractive for the larger companies, thus it will lose the current competitive advantage.

The second alternative is creating an Informal education ecosystem. By 2019, there are more than 50 informal education companies among which most of them are offering programing "academies" and training. From the ICT Export 2020 Report, which included interviewing more than 100 companies in "Software and IT Services" subsegment, they prefer to hire someone from formal than from an informal academy. That is directly suggesting that there is a discrepancy between the needs of the companies and what the informal centers are teaching or offering. Still, the development of Informal education shouldn't be "thrown" as a bad alternative by the companies if it is properly organized. It's also positive that the employees and people from other industries will have an interest in becoming part of the IT Segment. It is important also, that 66% of all interviewed companies would like to support informal education together with other companies in the segment.

The first and foremost activity to do is manage the expectations of all stakeholders involved in the informal education, as companies, students, formal education and of course informal educational centers. It should be explained to the **students** that after completing the informal academy they (most of them) cannot be hired on the same level as the ones who completed the formal education which is expected from them. The **companies** on the other hand should be more involved in creating the curriculum and defining the positions within their companies which could be filled with students from informal education centers.
The **informal education centers** should manage the expectations of their students by addressing the real possibilities after ending the program. And last but very important is establishing communication with the **formal educational centers** (Faculties) that the informal centers are not substituting them but producing potential employees for part of the working positions, thus getting their support and even involvement in the informal education system.

Research Details: ICT Export 2020 Report

The informal education centers could be also established directly by the companies within the segment, because as mentioned before from the field research 66% are willing cooperate between them in development of one. With this kind of organization of the informal education, the management of the stakeholder's expectations are very clear, because from the start the companies will express their goals, reasons, and expectations they have from the program.

There are examples of companies that have already implemented similar system for informal education in which the curriculum is structured in a way to teach its students the basic principles (or more advanced , it depends from the student) for the subject of interest, and if the student has exceptional knowledge or is showing interest they will potentially employ the candidate.

The third alternative which is more time consuming is significant support of formal education. Based on the answers from the companies, as expected the formal education (Faculties) is the main source for a qualified workforce. From the ICT Export 2020 Report, the average satisfaction of the companies from the formal education doesn't exceed 3.00 which is significantly bellow the needed of 4.00. Maybe (no official data) the educational institutions are meeting the educational requirements, but not the quantitative requirements (number of potential employees) of the market. It makes dissatisfaction among the companies, so they consider that the formal education is not meeting the expectations of the stakeholders.

The main issue here, is that the previously mentioned staff shortage of 600 employees per year, the companies are trying to overcome with ungraduated students, which to some extent is a reasonable solution, but its not sustainable on long-term and its ad-hoc solution. The ratio between the enrolled and graduated students on all technical faculties is 1:10 or from (official data) 6,870 enrolled only 685 are graduating. In that matter, the demanded support should be primary used in direction of increasing the quotas for the students which meanwhile inquire also increasing the capacities of the formal education.

The hiring of undergraduate students by the companies will continue, and the only viable strategic solution is to create a stable formal educational system. The students will continue with the studies, thus increasing the ratio of graduated students (at least duplicating it), but this demands is increasing the resources needed by the faculties which again is another issue to address. To some extent, this kind of cooperation is already implemented between one faculty and the companies, but it lacks formal organization and moderator and sustainable long-term model.

Research Details: ICT Export 2020 Report

The biggest setback of this very complex alternative is that it requires significant amount of time for implementation and getting results and formal (institutional and governmental) decisions which again require time. One generation is at least 4 years on Faculty, so today implemented activities would generate results in a minimum of several years period. **Still, this is maybe the best long-term solution because the formal education is improving the position within the industry (its low currently) and this alternative has more institutional power in future to be part of National Strategy for ICT than any other alternative.**

The fourth is creating a National strategy for education in the ICT Industry. The two most important additions are the creation of positive business environment from Government and its institutions and moderator as MASIT. For development of this alternative additional information is required which is not available in the current report.

The fifth alternative is any combination of the previous four, because they can be implemented partially and still produce significant results.

NATIONAL "SOFTWARE AND IT SERVICES" INTERNATIONALIZATION STRATEGY

"Fixing" the supply is the first issue that should be addressed, but utilization of the benefit from the IT Segment requires additional revenue from international markets. As analyzed, the ICT Industry, especially the IT Segment has significant export growth in the past few years, up to 210 million euros and trade balance surplus of nearly 121 million euros in 2019. Also, the benefits for additional 1 million euros in the subsegment of "Software and IT Services" are significant, creating 31 new working positions, 476,000 euros as gross salaries and 176,590 in taxes and state related expense. The "Software and IT Services" subsegment is outperforming all others in the industries. Thus, creating a strategy for aggressive internationalization of IT Companies can improve the whole Macedonian economy and not just the segment. The "natural" growth is between 30 – 45 million per year in the past 4 years, so with serious improvement of the business environment it can e even higher.

Other also important aspect, is the trade surplus of the IT Segment which is 122 million in 2019 while the export is 179 million and 63 million euros Import. Its highly positive that 63% of the total revenue in the segment is exported and only 23% is imported in the same years while the trade balance surplus is 41% of total revenue of the segment. From standpoint of additional 1 million of revenue within the IT Segment, according the numbers of 2019, 630,000 euros will be export, 230,000 will be import and the trade surplus would be roughly 410,500 euros.

The average growth of the export in the IT Segment is 25% per year or 23 million per year, or 100 million in nearly 4-year period. **Subjective perspective:** With solving the problem with the lack of qualified workforce and promotion for expansion on foreign markets, the growth can reach 30% per year (already achieved in 2016) on average means additional 10 million in export and revenues for domestic companies.

This activity is important from two related aspects. The **first one** is helping the businesses to get in contact with potential clients and **the second** is communicating the potential for investing and using the services from the Macedonian IT Companies.

From the ICT Export 2020 Report, most of the companies which sell on international market started the cooperation (wherever Partners or Directs Sales) through personal contacts or personal initiative. Very few companies have used some kind of support or professional networks to get in contact with potential clients. Partly (unofficially) there is potential for disinterest by the companies or lack of information about the international organizations and projects which are already working in North Macedonia. Still, even there is lack of interest or information the institutions should get involved because the export is of national interest and shouldn't be left on subjective interest of the companies. Also, there are companies with innovative ideas which are eligible for financial support from FITR (Fund for Innovation and Technological Development), but either they don't need the funding or the company itself is not eligible to apply in FITR, thus not getting the support needed for internationalization.

The second perspective of the internationalization strategy is the promotion of the IT Segment as investment and outsource destination which will create overall image and recognition of the industry. The high performance of the domestic IT companies should be strategically communicated. Focusing on individual/group promotion or presence on events will give a results, but when there is a point where the potential investors should perceive the Macedonian IT Segment and contact the domestic companies proactively.

Institutions as MASIT are promoting the IT Industry, but they are mainly focused on their members, which is expected because they have limited resources. To increase the scope and impact there should be broader National strategy for promoting the IT Industry in coordination with all stakeholders within the industry.

TAXES AND GOVERNMENT REGULATIONS FOR IMPROVING THE ICT BUSINESS ENVIRONMENT

This is the most sensitive part of the analysis are the tax regulations and how should they be used. From one side they must stimulate the financing of important activities as education and export, but from other not discourage all other industries paying taxes. The line is too thin, because every company in every segment and industry naturally want to pay less taxes. Additionally, the companies within the IT Segment have fair net-margin of nearly 13% and solid financials. High 49% of the companies interviewed in the ICT Export 2020 Report, have stated that introducing more simulative measures in the TAX Policy will create positive business environment. The tax regulations should be very specific and only for certain sectors within the IT Segment and aimed towards predefined goals. Allowing tax reductions for one Industry without clear expectation what are those reductions are for, will create tax evasion in the others. The main idea is not to increase the profit of the companies but solve bigger issues the companies in IT Segment are facing and with that allowing them to have larger profit.

Before continuing with the analysis, from the simulation which is created in this report, 1-million-euro additional revenue in the "Software and IT Services" subsegment is generating 176,500 euros of taxes and other state related expenses or 17%, compared to only 3.3% in more traditional segment as "ICT Trade" and 3% for "Telecommunication". It is very important to also stress that 57% of total expenses (47.7% of total revenue) of the companies are employee related which means that the companies in the IT Segment are having huge expenditures related to tax, compulsory social security contributions, health insurance. Considering the previous information, the amount the companies in "Software and IT Services" are paying as taxes and employee related expenses is significantly higher compared to other industry segments. To be clear, It doesn't mean that they should be excluded from paying the taxes, but there is significant space for redirection of part of that cash in overcoming the previously defined barriers.

The lack of qualified workforce and internationalization cannot be overcome without financial plan. The only way not to burden the companies even more, is Governmental regulations because the education and export are issues of national interest. The interviewed companies were asked what kind of institutional support they would like (besides TAX Reliefs) and their answers were 62% of the companies would like "Cost coverage for fairs/export activities", 58% would like "Staff Training", 47% answered "Export Subventions" and 36% for "Staff Re-Training". This is confirming the previous conclusion and focusing what those TAX reliefs should finance.

Research Details: ICT Export 2020 Report

X. EXECUTIVE SUMMARY
X2.5 RECOMMENDATIONS FOR THE FUTURE

PERSONAL AND CORPORATE TAX RELIEFS

The first measure for improving the business environment and is related to the Government policy towards Taxation, is directly allowing tax reliefs for the companies in the IT Segment, more specifically, cutting the personal and corporate tax of 10%. That measure should be for all companies registered in the IT Segment or part of its subsegments mostly the ones which are export oriented and have high added value. This kind of measure should be, as mentioned before, precisely defined for which type of companies is dedicated, and for what kind of purposes those additionally available money should be used for.

From the analyzed data in this report, the estimation of tax related expanses (corporate and personal) are between 8 – 10 million euros for "Software and IT Services" subsegment. If the state grants tax reliefs for the IT Segment or subsegments, they will give the opportunity for them to have additional up to 10 million to invest in their employees as net-salaries, education (formal and informal), Research & Development or internationalization of products and services.

LIMITING THE BASE ON WHICH COMPUSORY AND EMPLOYEE RELATED EXPANESE ARE CALCULATED

This measure is expected to significantly improve and increase the net salaries, investment in training and education or innovation and new products in the IT Segment. The proposal refers to the base on which compulsory, tax and other employee related expenses are calculated on upper limit of 1,500 euros monthly net salary. It means that for the employees that currently have for example 2,000 euros net salary, the company will be obliged to pay all compulsory and tax expenses on the limit up to 1,500 euros and above only the "flat tax" of 10% or not tax at all.

This proposal is duly justified and sustainable because one employee in the IT Segment which has salary of 2,000 euros is paying nearly 50% or 1,000 euros in taxes and compulsory or state related expanses, while the employee with average salary of 470 euros is paying four times less or 235 euros. Still, both of them are getting the same healthcare, education, public services etc, and most of all after retirement their pension will vary less than four times.

If the upper limit is set on 1,500 euros per month, in addition there is example for calculation. The company for the employee with 2,000 euros net-salary will pay 750 euros for compulsory and tax related expanses on 1,500 euro (the upper limit) and 50 euros tax for the additional 500 euros up for the salary of 2,000 euros net salary. Thus, there is potential for 10% increase in the salary of the employee or he/she will be getting 2,200 euros per month.

Still, that "free" 200 euros could be used not only for increase of the net-salary for the specific employee, but also additional education, training and development of current employees or financing educational (formal and informal) centers for future workforce development, something that is of great importance according all analyzed data in this report. If the company has for example 10 employees with such of salary (2,000 euros or above), this measure will generate 2,000 euros of free cash per month or 24,000 per year with which they can finance the education of at least 24 students on the technical faculties or sent their employees on more than 24 high-quality trainings per year.

In the end it is of great importance to define that this measure should be used only by the companies which are registered for "Software and IT Services" in the number of employees which are getting the monthly net-salary above 1,500 euros from macro-economical perspective is small. So the state will not "lose" significant amount of money, but they will allow the industry with the highest potential to develop and invest.

The bottom line is that the ICT Industry Business Environment needs improvement through tax reliefs/exclusions, national strategy for education and export of IT Services or combination of all of them. The performance of the ICT Industry especially the "Software and IT Services" subsegment unequivocally is showing that it can address most of the current national problems, as low national average salary, trade balance, employment and future development of the country. The measures should be very precise and directed in meeting the strategic goals and developing of the whole industry.

A. ICT INDUSTRY REPORT IN NORTH MACEDONIA

GENERAL OVERVIEW

General Macroeconomic Indicators

Nominal GDP* (2019): 11.3 Billion euro
GDP Growth Rate* (2019): 3.6%
GDP Per Capita* (2019): 5,380 euro
Unemployment Rate (2019): 17.3%
Average Monthly Wage (Gross – 2019 Q3): 608.92 EUR

* Estimated GDP, Growth Rate and GDP Per Capita;

		FISCAL YEAR					
	MACRO INDICATOR	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
1	GDP (real growth rates)	3.60	3.90	2.80	1.1	2.7*	3.6*
2	Inflation (end of period, annually, in %)	-0.50	-0.40	-0.20	2.40	0.90	0.4
3	Inflation (aver., on cumulative basis, in %)	-0.30	-0.30	-0.20	1.40	1.50	0.8
4	Unemployment rate (in %)	28.00	26.10	23.70	22.40	20.70	17.3

		FISCAL YEAR					
	TRADE BALANCE	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
1	Exports (in billions of EUR)	3.74	4.08	4.39	5.01	5.86	6.42
2	Imports c.i.f. (in billions of EUR)	5.50	5.80	6.17	6.83	7.67	8.43
3	Trade balance (in million of EUR)	-1.75	-1.71	-1.78	-1.81	-1.81	-2.01
4	Current account balance (as % of GDP)	-0.50	-2.00	-2.90	-1.00	-0.10	-2.80
	DIRECT INVESTMENT						
5	Direct investments - net (as % of GDP)	2.30	2.30	3.30	1.80	5.60	2.5
6	Direct investments - net (in million of EUR)	197.4	202.8	316.9	180.0	603.7	290.6
7	Gross external debt (stock, end of period, in billions of EUR)	5.99	6.29	7.21	7.37	7.84	8.19
8	Gross external debt (as % of GDP)	70.00	69.30	74.70	73.40	73.30	72.20

Source: National Bank of the Republic of North Macedonia
Source: https://www.finance.gov.mk/files/u1361/ratingsdirect_summary_northmacedonia_sep0619.pdf

North Macedonia has a GDP of a total of 11.7 billion euro (Nominal), or 5,380 euros GDP Per Capita. According to the World Bank and WEF (World Economic Forum), North Macedonia is in the group of "Upper-Middle Income" countries together with Bulgaria, Serbia and Romania. In the past 6 years, the country has a positive GDP growth rate from the lowest of 1.1% in 2017 to the highest of 3.90% in 2015. Still, the growth isn't significant, considered that North Macedonia has an underdeveloped economy, and huge growth potential in several industry segments including IT Sector. The Government has introduced several programs to fight informality (Gray Economy) which is estimated 30% - 40% of GDP, but because they were implemented in 2018/19 the real effects and results are expected in 2020. The macroeconomic outlook according to the World Bank is moderately positive with an annual average growth projected at 3.4% through 2021. From their projection the capital investments (including the highways, and private investment in energy and tourism) will be the main driver of growth. The "COVID-19" crisis in 2020 will have high (negative) impact on the economy, and from the unofficial projections is that there will be recession, but by the time this report is created is still too early to speculate the exact result.

The unemployment is declining continuously from 29% in 2013 to 20.70% in 2018 which is highly positive. From the latest available official information from the State Statistical Office, in the 2019, the unemployment rate is 17.3% for the first time in the independent Macedonian history, but still is very high. Most of the new jobs were created in manufacturing, transport and storage, administrative services, and entertainment. Again the "COVID-19" crisis will have impact on the employments, where from the unofficial data the unemployment will increase by the end of 2020.

North Macedonia has a trade balance deficit, where the import exceeds the export for an amount between 1.71 – 2.01 billion euros per year. On the positive side is that the export has increased by 98% in 6 years from 3.23 to 6.42 billion euros, while the import has increased by 69%, from 4.98 to 8.43 billion euros in the same period. The export became more diversified in the past few years, where more high-value products and services are produced in the country, among which the ICT Industry services.

North Macedonia has low FDI (Foreign Direct Investments) ranking from 229 million euros to a peak of 603 million euros in 2018 or they don't exceed more than 5.6% of GDP in 2018. The average % from GDP of DI for the period between 2013 - 2018 is 3.02% The external debt is rising from 2013 till today, with 5.21 billion in 2013 up to 8.19 billion euros in 2019 and it's expected the same trend to continue in 2019 reaching from 64% to 72.20% of GDP.

A. GENERAL OVERVIEW

A2.1 GENERAL BUSINESS ENVIRONMENT & STRUCTURE OF THE PRIVATE SECTOR

North Macedonia is a landlocked country, located in the Western Balkans Region part of the Balkan Peninsula with a total area of 25,713 km2. The total GDP of the country (estimated for 2019) is 11.3 billion euros in 2019 or 5,380 euro per capita and an average GDP Growth Rate (real) is 2.83% between 2013 – 2018.

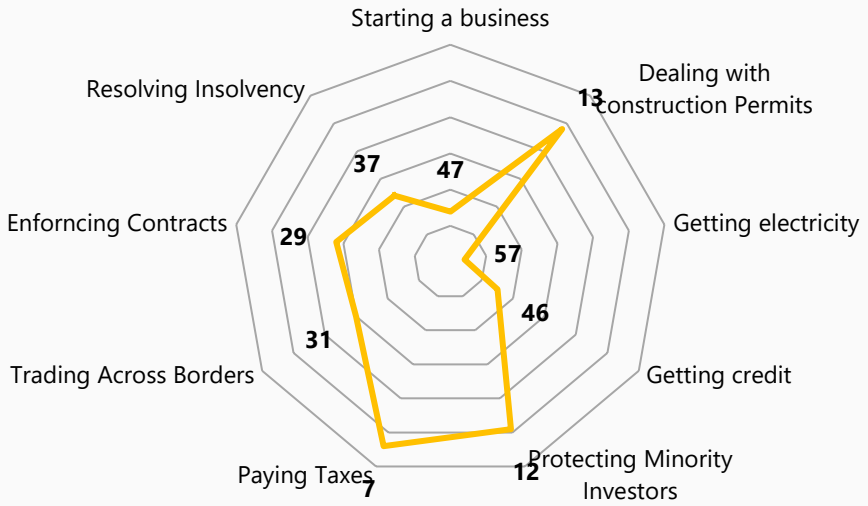
Macedonian economy is small compared to the other Balkan States especially with the ones in the same "Upper-Middle Income" ranking like Bulgaria, Romania, and Serbia. The private sector in North Macedonia still faces a range of obstacles to doing business, notwithstanding the country's strong performance in the World Bank's ease of doing business ranking. The report highlights some of the main problems that enterprises are facing in the country. This includes the large informal economy which is estimated 30%/40% of total GDP and the unfair burden is placed on the legitimate business, which illustrates the problems of a weak level of governance and enforcement of regulations.

The enforcement of competition policy is weak and administrative capacity in this area needs to be improved. The lack of access to finance is also an issue for many firms, particularly as non-bank sources of finance are largely undeveloped. To address the problem with the finance, several Business Accelerators were created in 2018 and the state-owned Fund for Technological and Industrial Innovations (FITR) is offering risk capital for Start-Up's and SME's especially for companies in the ICT Sector, but more about them in the report part named "Access to Finance".

STRUCTURE OF THE PRIVATE SECTOR

Most economic activities are privately – generated, and the stake in the economy is relatively small compared to other Balkan countries. According to the latest EC Progress Report (May 2019), full state ownership remains in 16 companies (as the past 3 years), and as result, the value of the state assets in the GDP has amounted to 11.7%, a share that has been steady in the past five years. Most of the economic activity is generated by the private sector, through the exact share of GDP is unknown, not least because of the large informal economy.

CHART A.01
Ranking on Doing Business Topics
DB 2019 Rank: 10
DB 2019 Ease of Doing Business Score: 81.55
Year: 2019



Source: World Bank – Doing Business Economy Profile Macedonia, FYR 2019

SMEs dominate the economy, but the environment for small businesses is often difficult. According to the State Statistical Office, SMEs make up nearly 99.8% of all businesses, with a share of employment equal to 76.6%, and they add an estimated two-thirds of the country's total annual value-added, a proportion similar to EU Average. North Macedonia is more Advanced than its peers in the Western Balkans in terms of policies to support SME's. Its average score on the OECD scale (across ten policy dimensions) is 3.42, on a scale of 1 to 5, compared to an average of 3.07 in the Western Balkans. But some problematic areas remain including: 1) Entrepreneurial learning and women's entrepreneurship (including women's access to finance); 2) SMEs in the green economy; 3) enterprise skills; and 4) support services for SMEs and Start-Ups;

Five sectors account for most economic activity. The five sectors are domestic trade, industry, public administration (including education, health care, and social care), real estate activities, and agriculture. Domestic trade, including transport and storage as well as accommodation and food services, is the largest sector in the economy, as it is in other Western Balkan countries. The share of public administration in the economy is 15% and it is smaller than in other countries of former Yugoslavia.

North Macedonia is rated highly among WB6 countries in terms of economic criteria for EU Membership. In the EU Progress Report, North Macedonia is assessed at a good level of preparation in "the existence of a functioning market economy" and as moderately prepared in "the capacity to cope with competitive pressure and market forces within the EU". Concerning the country's readiness to cope with market forces within the EU, the EC report identifies weaknesses in the education curricula, low innovation rates and major investment needs in public infrastructure as the main problems, although it recognizes progress made towards diversification of exports and higher-value added output in the manufacturing sector. Prioritizing policy reforms towards higher quality education and increasing support for new labor market entrants could go far in addressing these concerns.

From the historical data and its current performance, there is high probability that the ICT Industry will be one of the leading sectors in the Macedonian economy in near future if positive business climate is established. There are several reasons why the ICT Industry segment have the potential: 1) The added value for ICT services is high; 2) ICT sector has higher positive trade balance compared to some other segments which are considered as strategic for North Macedonia (example Tobacco Industry); 3) The positive trade balance (trade surplus) of IT services has grown 4 times in the period between 2014 – 2019 from 26 million euro to 115 euro; 4) The ICT companies and employees are becoming one of the largest taxpayers and spenders in North Macedonia; 5) The portion of total employees that are working in ITC is increasing; 6) The salaries of the employees (wage expenses) in ICT companies are significantly higher compared to nearly all other sectors; 7) Active business entities (companies) in the ICT Industry doubled in the past 5 years; 8) The faculties for ICT have enrolled most students;

Competition policy enforcement is weak. The Commission for Protection of Competition (CPC) level of expertise and administrative capacity is not adequate. Its level of finding varies each year, raising concerns about its independence. In addition, the CPC administrative capacity to deal with state aid remains inadequate. Also, corruption during the procurement process is frequent and little has been done to increase the cooperation between the CPC and the Commission for Prevention of Corruption.

North Macedonia is an intermediate knowledge economy, constrained by poor skill availability. The quality of secondary education lags behind EU levels, as shown by poor results on PISA exams, which test skills and knowledge of 15-year-old-students. This can also indicate a lack of understanding of how to use knowledge to solve practical problems, an important aspect for business development. The share of those with tertiary education is about half of the EU Average. Improving vocational education and training in line with private sector requirements is another area where more progress is required.

Source: EBRD – North Macedonia Diagnostics 2019 – Assessing Progress and Challenges in Developing a Sustainable Market Economy;

A. GENERAL OVERVIEW
A3.1 LEGISLATION FRAMEWORK

The development of the ICT Industry in recent years with an average growth of 5.9% or close to 900 million euros total income undoubtedly moves the entire economy of the country forward and has a significant effect on many macroeconomic indicators such as: reducing unemployment, increasing average wages, increasing exports, etc. This trend of movement of the entire ICT Industry with special emphasis on certain segments is expected to continue in the future, but the direction of movement is currently predetermined only by the operation of the companies themselves without a long-term development strategy by the state. Only, as a support for the ICT Industry, it has been issued National Short-Term ICT Strategy 2016 – 2017 in August 2015, but it has not been fully implemented. Yet, the dynamics of the development of the ICT Industry in every economy to some extent depends on the state policies that have a direct impact on the level of competitiveness and attractiveness of the industry. Analyzing the tax policy in North Macedonia, it is universal and does not imply special relief for the ICT industry, the same rules exist for every company.

Currently, the tax system implies a flat tax for all companies regardless of the activity and it has a better effect compared to the introduction of the progressive tax in 2019. In the times of existence of progressive taxation, the trend of faster growth of salaries in the IT industry or specifically in the field of computer planning, consulting, and related activities to the average salary are changing in the opposite direction. Unlike the years before the introduction of progressive tax rates when salary growth in the IT sector is several times higher in comparison with the growth of the average salary, in 2019 the average salary in the country has increased more than the growth of salaries in the field of computer planning, consulting and related activities. The effect of progressive tax rates is suggested as a reason for this reverse trend.

According to current regulations, the financial operations of companies can be affected by Personal Income Tax, Corporate Tax, and participation in Technological Industrial Development Zones. The rest of the financial support is distributed through three state pillars: investment support, competitiveness support, and innovation support.

IT LEGISLATION FRAMEWORK IN BALKAN COUNTRIES

To get a realistic picture of the need for change in the legal legislation by the state, it is appropriate to look at the situation in neighboring countries (Serbia, Bulgaria, Romania, and Croatia) which are making significant progress in the ICT industry.

For example, Romania is introducing a complete exemption from personal income tax for employees with an appropriate level of education who work directly on software development, and accordingly, there has been an increase in income levels, the number of employees as well as liquidity and stability in the operation of companies. The policy refers to 5 main rules: 1. Employees are required to have an appropriate level of education (in the fields of automation, computers, computer science, cybernetics, mathematics, or electronics); 2. To be employed in a company that is registered for an activity related to consulting and software delivery; 3. To work in the field of software development; 4. To have an appropriate position/title in the company (programmer or system designer) and 5. To be employed in a company that keeps special accounting records for software development revenues and it achieves a minimum of 10,000 dollars (per employee) in this activity.

Another example from the region is Bulgaria, where the ICT Industry also is a promoter of national economic growth and hires more than 35,000 people. There is a flat taxation system for all companies, but specifically for the ICT Industry, the state has set a limit on the basis on which employee's social and health insurance contributions are paid by the companies.

Serbia's tax system stipulates that employment income tax be collected at a rate of 10%, which is applied to the tax base calculated as income reduced by a certain amount that is not taxed. There are also certain reductions in the tax base for specific income categories. For example, to encourage investment in innovation, 80% of copyright and other related rights are not taxable.

Croatia's tax system does not imply special exemptions aimed at the ICT industry, but existing ones meet the needs and stimulate development. There is a complete exemption from all taxes for young people up to 25 years of age and a 50% exemption for young people up to 30 years of age. Also, young people up to 30 years of age are completely exempt from 16.5% compulsory health insurance contributions. The reductions in the part of the amount of the tax rate on the profit tax and the period in which it will be applied depending on the number of newly created jobs and the amount of the investment. Reducing income tax ranges from 50% to investing more than 50,000 EUR and creating 3 jobs to 100% exempting the profit tax from investing more than 3,000,000 EUR and creating a minimum of 15 new jobs. There are conditions for a period in which the employer is required to retain employees and investment. Also, small and micro enterprises can reduce the basis for profit tax by up to 55% for recognized education and training costs, while in medium and large enterprises that percentage is 45% or 35%.

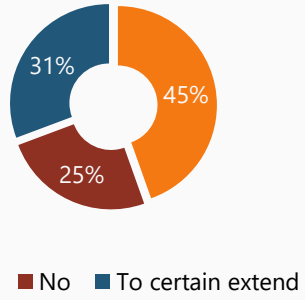
Source: "Reforms for improving business climate for the successful operation and growth of the ICT Industry" – Jovan Zafiroski

Through the above-mentioned positive examples from neighboring countries that have introduced various types of measures suitable for participants in the ICT industry, it can be noted that there is no universal approach to policymaking. To encourage the development of the ICT industry, they have tailored specific tax policies that are compatible with the structure of the industry and that have the greatest contribution to both sides, the companies and the fiscal policy of the country.

For that purpose, it was necessary to conduct a research to find out the needs and attitudes of companies on this issue, like: How big is the current tax burden for companies, Which of the taxes is most significant in the operation of the company, What type of support from institutions companies would like to receive, etc.

CHART A.02

E5. Do taxes significantly affect your company financial performance?



According the ICT Export 2020 Report survey results from ICT companies in North Macedonia, most of the companies exactly 45% answered that the taxes significantly affect the financial performance of the company, but on the other side for every 4th company, the answer is opposite, which suggest that change in the taxation policy is certainly needed but this opens the question if in case of implementing it, how big the impact would be toward boosting the development of the whole ICT industry, including the rest of the existing barriers in the industry.

As a percentage, the total amount of direct costs of companies in the form of taxes and contributions to the state is 47%-48%, which leads to a serious reduction in the financial resources of companies, but on the other hand a significant source of income for the state.

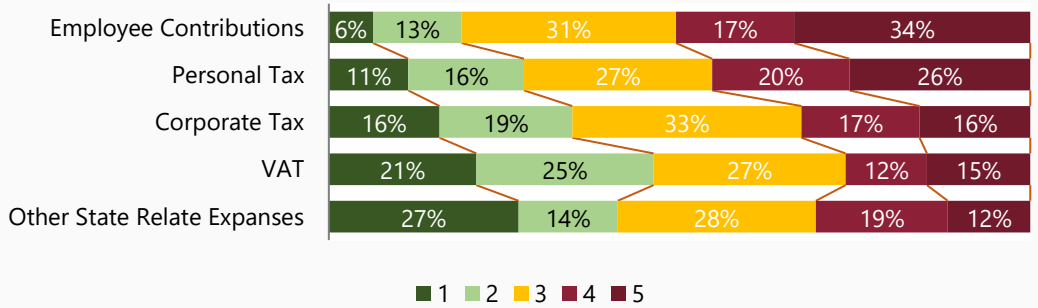
Additionally, companies are asked to rate the significance of the financial impact on a scale from 1 – no impact at all to 5 – extreme impact. Results showed that companies picked out Employee Contributions and Personal Tax with a share in a range from 45% to 51% as the most influential fiscal expenditure. This percentage reveals the number of companies that will have a chance to differently dedicate the amount of money if the government makes some releases on the company's duties. As a taxes with less significant impact are positioned Corporate Tax and Other State Relate Expanses with an almost equivalent share on rates 4 and 5.

VAT is distinguished with a lower impact on the performance of the companies, which is expected because the VAT is excluded in export (is not been invoiced).

CHART A.03

E4. How significant is the impact of the following taxes and expenses on your company?

General Obstacles Impact



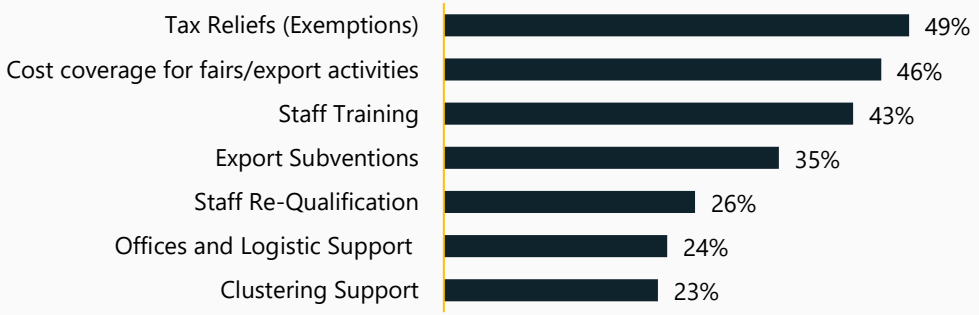
Ranking: 1 – no impact at all on my company | 5 – significant impact on my company

Research Details: ICT Export 2020 Report

Of great importance and the part of the ICT Export 2020 Report in which segment in the operation of the companies in the ICT Industry, the state should focus its support. In addition to the pre-existent three pillars of support: investment, competitiveness, and innovation that apply to the entire economy, IT companies in the survey pointed out that they would like to receive institutional support in three different segments. The main needs of the companies are noted for the following fields: Tax Reliefs (Exemptions), Cost coverage for Fairs /export activities, and Staff Training.

GRAPH A.04

E2. What kind of institutional support would you like to have?
General answer distribution



In general, all three fields where institutional support is needed are important for every second company in the ICT industry, but they all touch different areas and do not complement each other. The challenge for the affected institutions is to direct their support where will cause the most effective long-term results and solve the current problems in the industry. Although the general analysis of the needs of companies is of great importance for state support in the area of tax exemptions, when correlating with the type of company (whether it sells its products/services on the domestic or foreign market) there are differences in the priority needs for institutional support.

According to the companies, it is much more important, especially those who sell exclusively on the domestic market, to receive institutional support in terms of education of the employees and their additional training.

TABLE A.01

	A1. On which market do you sell your services?		B4. Are you offering final product (software solution), outsourcing activities or both?	
Kind of institutional support	**Domestic**	**International**	**Final product**	**Outsourcing**
Tax Reliefs (Exemptions)	24%	50%	43%	40%
Cost coverage for fairs/export activities	35%	41%	40%	52%
Staff Training	47%	38%	40%	44%
Export Subventions	18%	32%	28%	36%
Staff Re-Qualification	18%	32%	30%	20%
Offices and Logistic Support	18%	21%	30%	12%
Clustering Support	18%	24%	23%	20%

The ICT Export 2020 Report shows that 47% of companies that don't export their services or products, would need support for Staff Training which implies that the supply of workforce from the current educational system is not enough and does not meet the level of preparedness for the companies. This is the only segment where companies that sell on the domestic market showed a higher demand for institutional support compared to the companies that sell internationally. As a second need is Cost coverage for fairs/export activities with a share of 35% and in the third-place are positioned Tax Reliefs with 24%. The situation with the companies that sell internationally is different, the priority for the required support they consider should be directed in Tax Reliefs (Exemptions) with a share of 50% and Cost coverage for fairs/export activities with 41%. A related indicator linked to the matter of employee education is noted for companies that sell on international markets and it is associated with Staff Re-Qualification. Accordingly, the creation of a long-term strategy for state support should take into account the need for this type of companies and their importance for the ICT Industry in North Macedonia because of their significant share of "Software and IT Services" export into the total ICT revenue.

If we analyze the needs of companies according to the kind of service, there is a need for institutional support mainly in three generally analyzed segments but with different intensity according to the group to which the company belongs. For companies that offer Final product in the first place, the need for support in the direction of Tax Reliefs stands out with 43% compared to the companies that are Outsourcing for which the most necessary is Cost coverage for fairs /export activities with 52%.

Research Details: ICT Export 2020 Report

A. GENERAL OVERVIEW

A4. NRI (NETWORKED READINESS INDEX) AND GII (GLOBAL INNOVATION INDEX)

NETWORKED READINESS INDEX - NRI

The World Economic Forum's Networked Readiness Index (NRI), also referred to as Technology Readiness, measures the propensity for countries to exploit the opportunities offered by information and communication technology (ICT). The Network Readiness Index 2019 ranks a total of 121 economies. A total of 62 indicators have been identified for the NRI 2019. Of these indicators, 40 are hard/quantitative data, 12 are index/composite indicator data, and 10 are survey/qualitative data. North Macedonia is ranked on the 65 positions from 121 economies in the 2019 ranking, down 18 positions from the one in 2016. The average score of the country is 48.97, and average scores for 4 pillars, Technology 42.41, Impact 51.6, People 40.62, and Governance 61.24.

Compared to the counties which are considered as "role model" for attracting employees, large IT Projects and highly skilled employees Bulgaria and Romania, North Macedonia is behind at least 13 spots. Serbia has significant leap forward from the ranking in 2016, from 75th to 52nd place or jump of whooping 33 places. From the region (Montenegro and Kosovo are excluded from the NRI), only Albania and Bosnia and Herzegovina have lower scores and ranking from North Macedonia. The best ranking country from former Yugoslavia as expected is Slovenia with a score of 66.89 and 27 rank out of 121 countries.

NETWORKED READINESS INDEX

			PILLARS				
Country	**Score**	**Rank**	**Tech.**	**People**	**Gover.**	**Impact**	**Income Group**
Slovenia	66.89	27	64.86	58.06	76.13	65.53	High Income
Greece	57.07	43	57.02	53.25	61.62	56.39	High Income
Croatia	56.75	44	52.75	46.45	68.82	58.97	High Income
Romania	55.47	47	56.25	41.29	64.99	59.36	Upper-Middle
Bulgaria	54.77	49	56.11	45.06	63.54	54.37	Upper-Middle
Serbia	53.65	52	50.54	46.53	61.49	56.03	Upper-Middle
N. Macedonia	48.97	65	42.41	40.62	61.24	51.60	Upper-Middle
Albania	46.57	75	41.31	41.75	50.17	53.07	Upper-Middle
Bosnia and Herzegovina	42.72	81	35.70	33.65	51.88	49.46	Upper-Middle

Source: World Economic Forum https://networkreadinessindex.org/

If the pillars are analyzed in detail, Bulgaria and Romania rank better or they are approaching the scores compared to High-Income states (except Slovenia) in "Technology", "Governance" and "Impact". The only pillar that they are lacking significantly behind is the "People", especially in the sub-pillar "Business" which suggests that the business itself (not ICT Companies) has lower usage of ICT Services in everyday activities. (Stats in the Sub-pillar Business are: Firms with Websites, Internet Shopping, etc.)

North Macedonia is catching up only in the pillar of "Governance" which means that in some parts the requirements are met for developing the ICT Industry. Still in the same pillar, the stats like "Rule of Law", "Social safety net protection" and "Secure Internet servers" are significantly lower than Bulgaria and Romania.

GLOBAL INNOVATION INDEX - GII

The Global Innovation Index (GII) is an evolving project that builds on its previous editions while incorporating newly available data and that is inspired by the latest research on the measurement of innovation. The GII relies on two sub-indices—the Innovation Input Sub-Index and the Innovation Output Sub-Index—each built around key pillars.

GLOBAL INNOVATION INDEX

Country	**GII**	**Output rank**	**Input rank**	**Income**
North Macedonia	**84**	**63**	**52**	**Upper-Middle**
Serbia	55	57	62	Upper-Middle
Bulgaria	37	38	45	Upper-Middle
Romania	49	53	54	Upper-Middle
Croatia	41	52	46	High
Slovenia	30	30	33	High

Source: Global Innovation Index https://www.globalinnovationindex.org/

The general GII score of North Macedonia is 84. The economies that outperform on innovation relative to GDP are called innovation achievers. North Macedonia is new entrant in this group for 2019 for the first time which is highly positive. Even so, there is huge potential for improvement in most of the segments the country has low ranking and Bulgaria is one of the Top 3 Economies within the Upper-Middle income group and is far the best one compared to all countries in the region.

A. GENERAL OVERVIEW

A5. FINANCE DEMAND BY THE ICT COMPANIES IN NORTH MACEDONIA

Companies' needs for finance are always expected to be present including companies in the ICT Industry. The real challenge for the financial stakeholders is to measure if the available types of funding and amount are enough for satisfying the volume of the market demand. Also, a question that arises is about which companies' primary should receive funding considering their proper use and effects of contributions directly to industry development.

The EC (2016) report on Macedonia says access to finance remains difficult for SMEs, given impediments to both credit supply and demand, despite abundant liquidity of banks. This problem has been found across the country. The ILO (2013) Enabling Environment for Sustainable Assessment (EESE) Assessment found that the growth of SMEs is mainly based on self-financing, with a strong preference for the use of retained earnings or new, private or family capital or capital from friends. Debt financing is low, compared to other countries. Similarly, the use of business angels and venture capital is low. The cost of a bank loan was cited in the ILO (2016) survey as one of the greatest problems for SMEs, especially smaller firms.

Analyzing the current situation in the ICT Industry and its growth through the last years gives a solid ground for additional financial support which will certainly initiate an increase in the percentage of start-ups but as well boost of performance of the current enterprises.

According to the results of the research conducted where a representative number of ICT companies had to respond on question "C2. Rank the following aspect of your business by the degree you consider them as challenge/problematic", a total of 44% of the companies said that the access to additional finance for innovation and development is a problematic issue. In detail, 24% of the 44% ranked it as very problematic which suggests that for every fourth company in the analyzed industry there is a lack of finance that would support future development.

Generally, the analyzed aspect is in third place among ten analyzed aspects with an average rate of 3.31 on a scale from 1-Not problematic to 6- Highly problematic. It suggests that the problem with access to additional finance for innovation and development it's not crucial but takes an important role from the development objective of the companies.

CHART A.05

C2. Rank the following aspects of your business by the degree you consider them as challenge/problematic

Access to additional finance for innovation and development

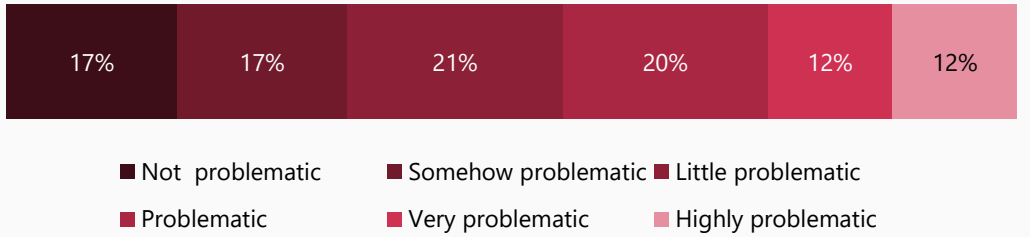
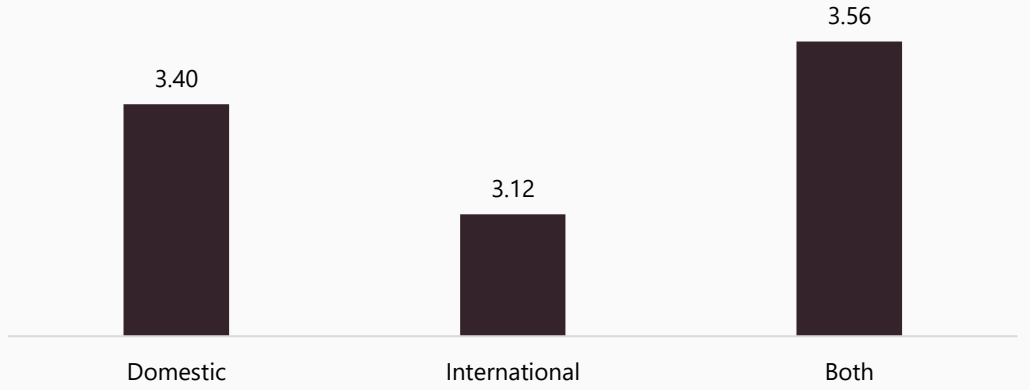


CHART A.06

A5. Access to additional finance

Correlation: Access to additional finance for innovation and development- On which market do you sell your services?



A. GENERAL OVERVIEW

A5.1 FINANCE DEMAND BY THE ICT COMPANIES IN NORTH MACEDONIA

The average score that the ICT companies gave for Access to additional finance is defined in a range from 3.12 to 3.56 depending on the market where they sell their services, implicating on existing differences. It's noticed companies that have a pure sale of services on International markets ranked the analyzed aspect as less problematic and it takes the sixth place on scale among ten aspects.

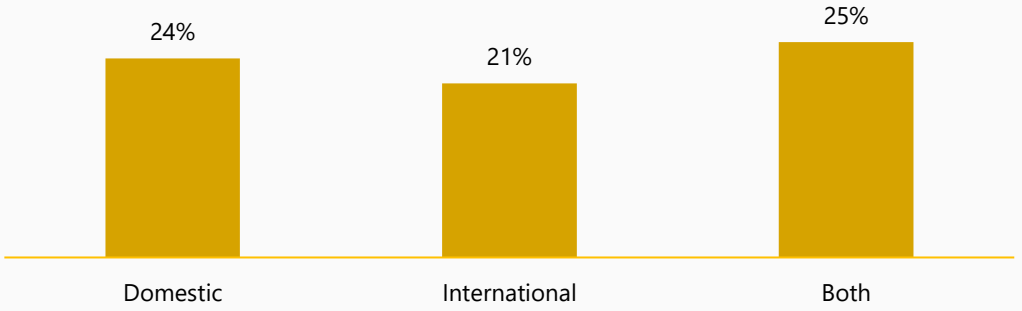
If compared, the ICT companies that only operate on the Domestic market where the average score is higher and it's in the fifth place which suggests that it isn't their main challenge, but it is present and still consider as a problematic aspect. Even though there is financial support available for the companies, there is a lack of awareness firstly for their existence and then about the conditions for eligibility of companies and their further usage.

An addition to the previous analysis of different business aspects, ICT companies that took part in this year's ICT Export 2020 Report research were also asked if "they have invested in developing new software, enhanced software, SAAS, etc. in the past 24 months?". The companies that had invested were asked about the biggest issue they had. For every third company in North Macedonia which invested in developing a new product, as the biggest issue stood out the funding issue on the same level as new and unknown technologies.

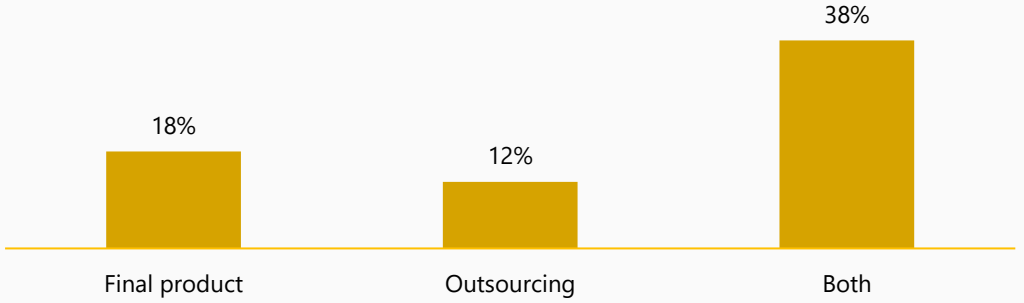
In the correlation made on Chart A.07 is noticeable that companies that work on the domestic market have bigger issues with Funds in comparison to companies that sell internationally.

Based on the kind of service the company offers, there is a different percentage of considering Funds as the biggest issue. Therefore, for the companies that offer final product, funding is considered as the biggest issue with +6% compared to companies that are outsourcing their services (12%). Accordingly, future planning of public/private funds should be more oriented towards companies that offer final products in order to meet the market demand and enable more companies to invest in new products and technologies and produce a positive impact on the ICT Industry performance level.

GRAPH A.07
A6. Funds
Correlation: Funds - A1. On which market do you sell your services?



GRAPH A.08
A6. Funds
Correlation: Funds. - B4. Are you offering final product (software solution) or outsourcing activities or both?



Research Details: ICT Export 2020 Report

A. GENERAL OVERVIEW

A5.2 FINANCE SUPPLY FOR THE ICT COMPANIES IN NORTH MACEDONIA

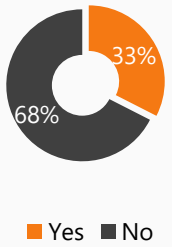
Generally, the finance supply for ICT Industry in North Macedonia comes from different sources including Incubators, Technology Parks, Accelerators, Banks, State-owned institutions, and EU findings. Each of the available types of financing is suitable for different growth stages in the company's life cycle.

According to the information gathered in the ICT Export 2020 Report, the average percentage of companies that have applied for funding from FITR or other institutions is 33%, which is considered a positive sign that the companies are informed of the financing options, aware of their usage in supporting the growth of the company. Anyway, this information should be considered with reserve, regarding the random choice of the companies in the research.

CHART A.09

A6. Have you ever applied for funding from FITR or other institutions?

General answer distribution



INSTITUTIONAL SUPPORT

Through FITR, the state realizes the third pillar of the state plan, the so-called Economic Growth Plan, and focuses directly on supporting innovation. Two types of instrument from FITR are available for the companies. The first is Financial support instruments under pillar 3 of the Economic Growth Plan that support: Co-financed grants for technological development; Co-financed grants to improve innovation; Co-financed grants for small and medium enterprises with a tendency to fast growth ("Gazelles") and Co-financed grants for micro enterprises and Co-financed grants for professional development and internship for newly employed young people.

The second is Support program through the "Skills Development and Innovation Support Project" funded by a World Bank loan and supports: Co-financed grants for newly established trade companies' "start-up" and "spin-off"; Co-financed grants for commercialization of innovations; Co-financed grants for technological extension; Co-financed grants for establishment, operation, and investment in business technological accelerators.

The latest information about the results of the call for the instrument "Co-financed grants for start-ups and spin-offs" showed 4.5 higher applicant's demand for financing compared to a dedicated amount of money for the exact call. The structure of the companies that showed interest in this kind of support is 88.5% micro vs. 11.5% small companies. Analyzed by the industry 42% of the companies operate in the IT Industry.

FITR IS FOCUSING ON THE FOLLOWING ACTIVITIES

Co-financing of micro, small and medium-sized enterprises, registered in the Republic of North Macedonia, with the aim of encouraging innovation, implementation of innovative solutions and processes, introduction of innovations and technology transfer to companies, as well as support to high performing companies with growth potential;

Financing start-ups, micro and small companies registered in the Republic of North Macedonia, foundations and accelerators, with the aim of fostering innovation in companies and transferring the results of scientific research into applied or commercial activities, by establishing a spin-off companies.

Achieving a long-term positive contribution to the development of the national economy, improving competitiveness through technological and operational upgrades and providing new jobs; supporting the establishment of business-technology accelerators, entities providing infrastructure support to innovation activity, with the aim of accelerating entrepreneurship by supporting individuals who want to start a company, as well as start-ups in their start-up phase (existing for a maximum of 6 years) by providing educational, logistical and financial assistance.

Research Details: ICT Export 2020 Report

A5.3 FINANCE SUPPLY FOR THE ICT COMPANIES IN NORTH MACEDONIA

One of the agencies dedicated to entrepreneurship development in the country is **APPRM-Entrepreneurship Support Agency.** The main purpose of the agency is to implement Government policies for SMEs and other related projects/programs adopted by the Government to support entrepreneurship, competitiveness, and innovation. The Agency supports sustainable economic development, regional development, and employment growth, supporting Macedonian companies in starting new businesses, their growth and development, and reaching a technological level for a more competitive appearance on the international market.

Another support institution is **NCDIEL- National Centre for developing innovation and entrepreneurial** learning which is being developed under the recommendations of the South-East Europe Co-operation of Innovation and Finance Agencies project. This network seeks to strengthen the capacity to effectively provide innovative, technological and financial support to micro, small and medium enterprises.

BUSINESS ACCELERATORS IN NORTH MACEDONIA

Business Accelerator is a program that provides emerging companies with access to mentoring, investors, and other forms of assistance that will enable them to become stable and self-sustainable businesses. Companies using business accelerators are often the "Start-Up" that have passed the first stages of founding. In fact, they are entering the Adolescent phase, which indicates that the business is to some extent self-sustaining but needs guidance and support to create a long-term growth strategy. Companies that are underdeveloped and not prepared for an accelerator program should first get the support of business incubators. In addition to mentoring and investing, the business accelerator enables growing companies to access logistical and technical resources as well as office space. The accelerator also connects companies into networks of participants/associates from which experience companies can learn about business.

The three accelerators are planned to support 100 companies in the next 3 years. Within the accelerators, the companies are planning full support, mentoring, and all the necessary conditions for the development of business plans and innovations. Accelerators are a useful opportunity for start-up companies in the ICT Industry to continue the development process for the companies that have left the incubation period. Entering the stage of "adolescence" where the probability of successful growth is increasing, additional support is necessary through building appropriate conditions for achieving the same.

EUROPEAN UNION FUNDING

Besides the domestic supply of finance, EU funding is also an available and very important support for the Macedonian ICT companies. The European Commission has set up a "Small and Medium Enterprises Executive Agency" which has the main objective of managing several EU Programs in the areas of support, innovation, climate change, energy, environment, etc.

EASME is the most important agency to monitor all events, as it coordinates projects and initiatives that are of major importance for financing, grants, and support to SMEs and organizations that mediate between companies and European agencies. This agency is of the utmost importance for the entire entrepreneurial eco-system in the country.

COSME is a European Union program for "Promoting the competitiveness of small and medium-sized companies", in the period 2014-2020, with a budget of 2.3 billion euros. COSME is directly supporting innovative SME's thus the IT Companies also.

The Horizon 2020 project is the largest EU research and innovation program with a budget of approximately 80 billion euros over a 7-year period (2014 - 2020), which is expected to attract additional investment from private sources of funding. The Horizons 2020 project is the financial instrument for the implementation of the Innovation Union initiative, the main program for securing competitive advantage.

COMMERCIAL BANKS

Commercial Banks should be considered as one of the most important parts of the finance chain, but their position from the availability perspective in North Macedonia is different. Banks are known for their very steady credit risk portfolio. Mainly. they are directed to supporting only low-risk loans and avoiding risky projects such as start-ups finance needs.

Also, "European Investment Bank and Fund" provides crediting through intermediary institutions like "Development Bank in North Macedonia" and "**EBRD Macedonia**" (European Bank for Reconstruction and Development). European Bank for Reconstruction and Development finances big projects from 5 mills. euros to 250 mills. euros (more than 800 hundred big projects are financed by now). Smaller projects are financed through financial intermediates like commercial banks, capital funds, leasing institutions allowing entrepreneurs, and small businesses greater access to finance.

ICT INDUSTRY DETAILED ANALYSIS

B. ICT INDUSTRY PERFORMANCE

B1. GENERAL ANALYSIS AND INTRODUCTION

B. ICT INDUSTRY PERFORMANCE

B1. EXPLANATIONS ABOUT THE FINANCIAL ANALYSIS

ANALYSIS EXPLANATION

The financial analysis are calculated by using data obtained from CRM and provided through Ministry of Information Society and Administration. In total, 2,634 companies are analyzed between 2016 – 2019, which are or were active (by law) in the previous period. For every subsegment revenues, expenses, number of employees, employee related expenses, average income and expense per employee, operating margin and projection for the next two years is analyzed. The net-profit is also analyzed, but the operating income and margin are better indicator for the performance of the companies, because they are showing how good one company is performing from its primary activity and by this the ICT Industry in general.

The biggest issue for analyzing the financials is the classification of the companies by their registered (primary) activity. It is common that one company has been registered with one classification code the last year and included in financial performance in that year, but in the current one to change the code thus to be excluded from the financials. Also, different data sources are giving different information (from State Bureau for Statistics, UJP, NBRM), issue that shouldn't be happening, but maybe the discrepancy is due different classifications or used methodologies for analyzing and structuring the data. The consultants are analyzing the data as it is, for the given time-frame, so if one company is classified within the ICT Industry for example in 2016 its financials are included in the input, but if the same company has changed the classification in 2017 it will be excluded and vise versa.

The ICT Industry is divided, by the nature of their work in 5 different subsegments: Telecommunication, Software and IT Services, ICT Trade, ICT Manufacturing and Other IT. Within the subsegments there are 19 different sectors, which are also analyzed separately to define their financial and economic performance.

Also, as **economically active (or just active) companies are considered the ones that have income over 1 euro in the respective year**, by which they are showing some economic activity. Those are the companies which will be analyzed and taken into account for this report. Statistically and by law, active companies are all registered companies who have submitted tax report, even with 0 revenue. The calculation is very important to be done based on the economically active companies, because including companies which are not producing any economic value will reduce the average values, thus the conclusions won't be realistic.

Note: because there are few IT Manufacturing companies, they will be integrated with the ones in IT Trade but analyzed separately as sectors so accurate conclusions are made.

The projections for the next few years are created as average of the absolute growth in the past 4 years. If its calculated based on relative numbers (percentages) in some alternatives are highly inaccurate and growing the values exponentially and not allowing accurate predictions. When projection is highly unstable and there is no clearly expressed trend in the data, will not be shown in the analysis to avoid false conclusions and opinion on the subject.

Another specific is the difference between the net-profit/margin and operating income/margin. Naturally, the operating income should be higher than the net-income, because is delivered by extracting all operating costs (from primary activity) from the total revenue (from primary activity). Afterwards all additional income streams (from various investment, interest etc.) are added and additional expenses are extracted (interests, loans etc.) thus getting to gross-profit. When the Corporate TAX is subtracted from the gross-profit, the net-income is calculated. Also, the financial loss should be subtracted from the Net-Profit to get a number that is close to the result between the subtraction product between revenue and expenses. There is possibility in some subsegments or sectors that the net-income has higher value than the operating-income due the previously mentioned additional revenue of the companies.

All financials and information about the companies are gathered and structured in one central database from which all calculations are made. That is allowing consistency and relevance within one projection as well as between differently connected projections and analysis.

In this section, first the whole ICT Industry is analyzed in general and its performance, then all segments and subsegments as "Software and IT Services", "Telecommunication etc.", after that all sectors within the subsegments are analyzed in details and in the end simulation about the performance of different subsegments is made.

B. ICT INDUSTRY PERFORMANCE
B2.1 GENERAL ICT INDUSTRY PERFORMANCE

PERFORMANCE OF COMPANIES
INTRODUCTION AND SHORT ANALYSIS OVERVIEW

The financial analysis of the ICT companies and its subsegments is crucial to break down the results and define exactly which sectors are responsible for the growth. In matter of fact, the analysis will enable to define the sources of multiple issues the industry is facing as the serious lack of qualified workforce and the reality for the financials performance and needs. Additionally the analysis would define, what should the state and its institutions implement or enhance, in order to create better business environment especially for the "Software and IT Services" subsegment. One of the biggest questions this analysis should answer, is how many new potential qualified employees should the educational system be producing per year to satisfy the companies needs. From the research conducted for this report, the competition between the companies and availability for a qualified workforce is among the biggest challenges.

The most important part of this segment of the report is the simulation of what does it mean to have an additional 1 million euro in revenue in terms of expenses, employee-related expenses, number of jobs created, and tax. This calculation should highlight the potential of "Software and IT Services" subsegment and emphasize the need for structural, strategic, and institutional support mainly as an effective National Strategy for ICT Industry Development.

SHORT CONCLUSION WITH GENERAL INFORMATION ABOUT ICT INDUSTRY

Note: Because there is a huge number of subsegments and sectors within the ICT Industry the information below should be taken only as general and average for the industry. In the detailed analysis, the segments are broke down and analyzed to the integral parts, so the information is highly accurate and reliable for usage.

Currently, there are 1,957 economically active companies in the ICT Industry in 2019, which generates a total of 879,65 million euros in revenue, 792.48 million expenses, and 118.65 million net-profit. There is a high probability that in the next 2 years the revenue will reach nearly 1 billion euros and 134 million net-profit. Most of the companies or 56% of the total are concentrated within the "Software and IT Services" subsegment and 27% in "ICT Trade and Manufacturing". From the projection, the total number of economically active companies will reach 2,390 or growth of nearly 15% compared to 2019.

The industry is employing a total of 15,093 individuals with total employee-related expenses of 199.69 million euros (gross salaries) and 138.33 million in net salaries and salary allowances in year 2019. It is expected that in the next several years the number of employees to grow up to 17,676. The average number of employees per company is 7.46 with a possibility to decrease in the near future to 7.17. If the intensity for start-ups and new companies enlarges, and there is no solution for the educational (supply) problem, in the next few years, the total number of employees may grow even faster but the average will decrease even more.

From the employee-related indicators, the average revenue per employee in 2019 was 58,884 euros down from 68,482 euros and with high probability, it will continue to decline to 52,522 until 2021. On the other side, the average expenses per employee are 51,168 in 2019 and they are also down from 64,846 and will continue, reaching 43,448 euros. Even in a period when the average revenue and income are declining, the average net-profit is growing from 5,386 to 6,875 between 2016 - 2019 and probably will continue to grow to reach 8,000 euros in 2021. The average employee-related expense (gross salary) per employee is between 12,048 and 13,966 in the same period with the projection to 2021 included. Considering that the wage-related expenses (healthcare, insurance, etc.) are on average 47% of net-salary, subtracted from the previous gross salary, the calculated average Net-Salary in the ICT Industry is placed from 7,526 euro to 8,242 euro or 627 euro to 686 euros from 2016 to 2019. It should be noted that the average salary of all ICT Industry consists of all employees from building maintenance to General Managers and Owners of the companies. Thus, the detailed financial analysis of every subsegment is giving by far more accurate picture.

The largest segment by revenue in 2019 is "Telecommunication" by far with 368 million euros in front of "Software and IT Services" with 273 million in the same year. Still, by 2021 this two segments will be the same by revenue, and currently when it comes to employee related expenses (salaries etc.) and the number of employees the software segment is the leader and has significant share of the employee related costs in total cost structure.

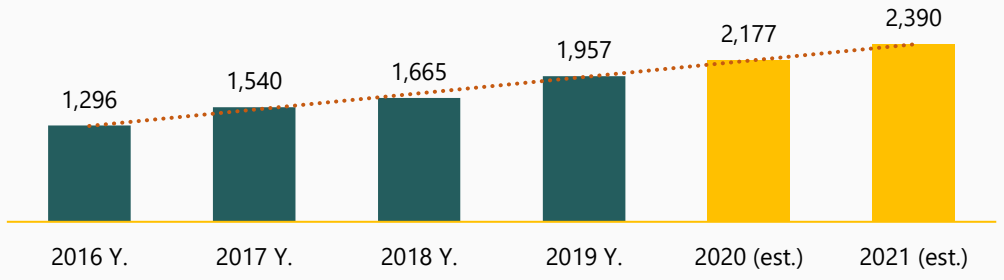
In general, the whole ICT Industry, and again especially "Software and IT Services" subsegment has a huge potential for growth and having an impact on the whole Macedonian economy.

B. ICT INDUSTRY PERFORMANCE
B2.2 GENERAL ICT INDUSTRY PERFORMANCE

The first part is dedicated to analyzing the overall performance of the ICT Industry and defining the basic indicators. This will allow comparison between the industry as a whole and its subsegments even sectors within the subsegments. About the future projections, the crisis caused by the COVID-19 virus through 2020 will have severe impact part of the companies in ICT especially the ones working in the retail segment, thus it is hard to define the exact consequences until relevant data is available for analysis.

By 2019, there were 2,198 registered and active by law companies, but economically active (with revenue at least above 1 euro) were 1,957 within the ICT Industry. The number has grown 50% from 2016 to 2019 with an average growth rate of 14% per year in the same period.

CHART B.01
ICT INDUSTRY Economically Active Companies
Growth (2019/16): 51%
Criteria: income above 1 euro



Because the ICT industry especially the sectors within the subsegment "Software and IT Services" has substantial growth until now but also in future, the number of companies will continue to grow to 2,390 in 2021 with the possibility this number to be even higher in the same period.

CHART B.02
ICT GENERAL COMPANY PERFOMANCE
in million ('000 000) euro

	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 (est.)	2021 (est.)
Revenue	751.59	803.02	850.97	879.65	922.34	962.11
Expenses	711.69	720.01	756.37	772.28	792.48	816.64
Profit	59.11	70.19	93.26	103.77	118.65	134.80
Financial Loss	27.12	9.88	8.91	8.65	0.00	0.00

The ICT industry has a total of 879 million euros in 2019 up from 751 million in 2016 and total growth (2019 compared to 2016) of 17% in a 4-year period. From the trend, the revenue could reach nearly 960 million until the end of 2021, if the growth continues to be between 30 – 50 million per year or 5% on average. Even this growth is not significant, its higher than the GDP growth of the domestic economy (3.6% estimation in 2019), which is again positive, but not high enough if we consider that the ICT Industry is in development and there is huge potential. Because the ICT Industry is very diversified, and the nature of business on different companies, in the detailed subsegment analysis different growth rates could be observed.

The expenses on other side were 772 million in 2019, with an estimation that they will grow up to 816 million by 2021. Thus, the profit was 103 million in 2019 and it will reach 134 million by 2021. It's positive that the expenses are growing at a slower rate compared to the revenues (3% in expenses compared to 5% in revenues), which directly suggests that the companies potentially having higher profits until now and in future the difference in absolute numbers will grow.

Note: when analyzing a whole industry segment, the net-profits doesn't represent only the difference between the revenue and expenses (which are from the primary business), but the financial loss, additional revenue (mostly financial) and other financials present, so from an analytical point of view and for the purpose of this report, only the main financial indicators will be analyzed.

B. ICT INDUSTRY PERFORMANCE

B3.1 ACTIVE BUSINESS ENTITIES (ECONOMICALLY ACTIVE >1 EURO REVENUE)

TABLE B.01
ECONOMICALLY ACTIVE COMPANIES STRUCTURE IN ICT SEGMENT AND SUBSEGMENTS

Subsegment	Sector	16 Y.	17 Y.	18 Y.	19 Y.	% of total in ICT Industry	% of total in Segment
Telecommunication	Wired telecommunications activities	31	33	32	33	1.7%	27%
	Wireless telecommunications activities	18	20	21	23	1.2%	19%
	Satellite telecommunications activities	4	5	5	5	0.3%	4%
	Other telecommunications activities	51	55	57	62	3.2%	50%
	Subtotal - Telecommunication	**104**	**113**	**115**	**123**	**6.3%**	
Software and IT Services	Publishing of computer games	0	0	0	8	0.4%	0.7%
	Other software publishing	0	0	0	3	0.2%	0.3%
	Computer programming activities	323	387	448	533	27.2%	48.2%
	Computer consultancy activities	111	130	141	164	8.4%	14.8%
	Computer facilities management activities	8	9	9	8	0.4%	0.7%
	Other information technology and computer service activities	226	261	289	313	16.0%	28.3%
	Data processing, hosting and related activities	46	54	63	76	3.9%	6.9%
	Subtotal – Software and IT Services	**714**	**841**	**950**	**1105**	**56.5%**	
Other IT	Web portals	41	89	93	122	6.2%	67.8%
	Repair of computers and peripheral equipment	0	0	0	58	3.0%	32.2%
	Subtotal Other IT	**41**	**89**	**93**	**180**	**9.2%**	
ICT Trade	Wholesale of computers, computer peripheral equipment and software	105	116	123	133	6.8%	25.1%
	Wholesale of electronic and telecommunications equipment and parts	89	103	103	107	5.5%	20.2%
	Retail sale of computers, peripheral units and software in specialised stores	173	185	183	186	9.5%	35.2%
	Retail sale of telecommunications equipment in specialised stores	57	80	85	103	5.3%	19.5%
	Subtotal ICT Trade	**424**	**484**	**494**	**529**	**27.0%**	
ICT Manufacturing	Manufacture of computers and computer peripheral equipment	13	13	13	13	0.7%	65.0%
	Manufacture of communication equipment	0	0	0	7	0.4%	35.0%
	Subtotal ICT Manufacturing	**13**	**13**	**13**	**20**	**1.0%**	
	Total ICT Industry	**1296**	**1540**	**1665**	**1957**		

As analyzed before, 1,957 companies were economically active by 2019 up from 1,296 in 2016. Still, it is very important to get a detailed concentration of the segments and subsegments in the total number to get a glimpse into their structure.

Note: the % of the total in the ICT Industry and % of the total in Segment are calculated from the total and subtotals for every segment for 2019 because they are currently economically active companies.

Most of the companies in the ICT Industry are concentrated in the "Software and IT Services" subsegment or 56.6% of the total number. The two sectors within the Software subsegment, "Computer Programming..." and "Other information...." have a significant combined share of 44% in total number of economically active companies in the ICT Industry. In a matter of fact, the same subsegment has the largest growth of economically active companies of nearly 400 in a 4-year period, and from the later projections, they will grow even faster in the future projections.

The second subsegment with a share of 27% is ICT Trade in which there is no dominant sector, or all of them have a fair share in the total number of companies. This segment is very specific for assessment of the number because part of the companies within is changing the classification code on yearly bases, so one company this year could be classified as a retailer for computers and the next as a retailer for home appliances. By law, the classification is based on the product/service category that has the largest share in the revenue of the company.

The segment which has the highest revenue and profits from all within is the ICT Industry is "Telecommunication" but has a share of "only" 6.3% of the total number of companies. The most interesting part is that the largest revenue (312 million euros) is produced by 1.2% of the companies in the "Wireless telecommunication activities". Although this subsegment doesn't have a large share in the number of companies, it has a very high impact on every aspect of the ICT Industry from revenue, expenses to profit and overall performance.

Last two subsegments of the ICT Industry are "ICT Manufacturing" with 1.0% and "Other IT" with 9.2%. Most of the companies in "Other IT" are concentrated in "Web portals" with 6.2% in the total number of companies.

The structure of the companies in near future won't change dramatically, there is potential for significant growth in "Web Portals" and "Software and IT Services" but all other subsegments will remain in the range they are already in the moment.

B. ICT INDUSTRY PERFORMANCE
B3.2 ACTIVE BUSINESS ENTITIES (STATISTICAL DATA)

TABLE B.02
NUMBER OF ACTIVE COMPANIES BY INDUSTRY

INDUSTRY	Active Business Subjects	Share of Total	Average Growth (2014 - 2019)
G Wholesale and retail trade; repair of motor vehicles and motorcycles	23140	32%	-1.27%
C Manufacturing	8362	11%	1.75%
M Professional, scientific and technical activities	7636	10%	4.62%
H Transportation and storage	5780	8%	-0.46%
F Construction	5270	7%	3.95%
S Other service activities	5976	7%	7.59%
I Accommodation and food service activities	4777	6%	1.25%
Q Human health and social work activities	3241	5%	-0.48%
A Agriculture, forestry and fishing	2605	4%	-1.69%
J Information and communication	**2041**	**3%**	**6.75%**
N Administrative and support service activities	1962	2%	4.85%
R Arts, entertainment and recreation	1753	2%	8.46%
P Education	1289	2%	3.92%
L Real estate activities	645	1%	5.01%
K Financial and insurance activities	470	1%	3.33%
O Public administration and defense; compulsory social security	264	0%	0.00%
E Water supply, sewerage, waste management and remediation activities	260	0%	-2.62%
B Mining and quarrying	221	0%	4.30%
D Electricity, gas, steam and air conditioning supply	224	0%	8.38%
General Growth	75916	100%	0.59%

Source: State Bureau for Statistics – North Macedonia

Note: The segment "J. Information and communication" (according NACE Classification) is including the subsegments "58. Publishing activities" and "59. Motion picture, video and television program production, sound recording and music publishing activities". The shown statistical data will be use sorely in the current slide and analysis because for the comparation with other industries because its not reliable 100% for additional analysis.

The only available way (currently) to compare the growth between different industries is the official statistical data of active subjects. This analysis is created sorely to compare the growth between the industries, not to analyze the specific number of active subjects. All other analyses in the report including the number of economically active companies in the ICT Industry and its subsegments are delivered from the companies' classification and financial statements. The number of companies shown in "J. information and communication" does not include the companies which are part of the "ICT Trade and Manufacturing" subsegment.

From the official statistical data, currently, there are 2041 active (by law) business subjects in the ICT Industry (without the trade and manufacturing) with a 3% share in the total number and average growth of 6.75%. The ICT Industry is ranked on the 10th position by the number of active business subjects, out of 19 in total. The growth is 4th among all other industries, just behind "Art, entertainment and recreation" with 8.46%, "Electricity, Gas, Steam and air conditioning supply" with 8.38% and "Other services" with 7.59%. There is no available way to include them, but if statistically the ICT companies are classified under the "G. Wholesale and retail..." and "C Manufacturing" is added in the industry, the final number of companies will be even higher as potentially but also as the average growth.

There is another information that can be extracted from this statistical numbers, and that's the comparison between the official number or companies active by law and the economically active companies which have revenue above 1 euro. Active by law as seen in the table is 2,041 companies but by the same classification economically active are 1,408 companies (Subsegments: "Telecommunication", Software and IT Services" and "Other IT") or nearly 69% of the total number of companies are active. That is directly suggesting that a high 31% of the total number of companies are considered as active but they are not having any kind of activity, thus they should be excluded in the financial analysis.

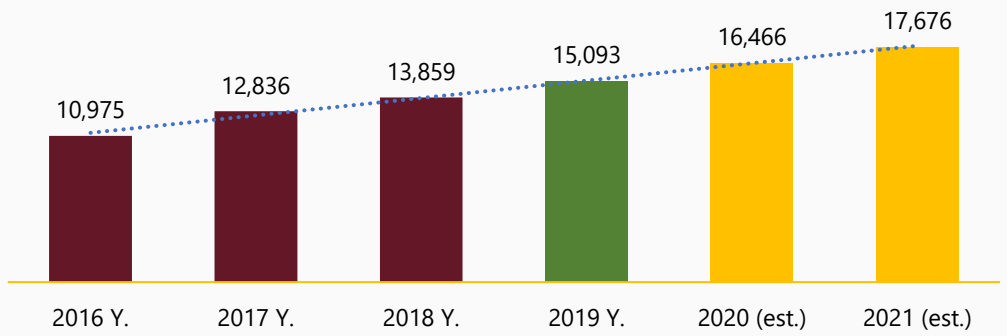
Also, the ICT Industry as it is statistically classified will overtake industries that are strategic for the Macedonian economy such as "A, Agriculture, forestry and fishing" in several years. This is very important because these industries are having strong institutional especially financial support to sustain and develop, opposite of ICT where there is no National Strategy for development and the institutional support is very weak.

B. ICT INDUSTRY PERFORMANCE
B4.1 EMPLOYEE RELATED PERFORMANCE

The growth of the number of employees in the ICT Industry is depends on several factors, which if were met the number could be even higher than it currently is. First and foremost, the lack of qualified workforce within the industry is considered as most serious challenge by the companies, which is suggesting that the supply of potential employees isn't satisfying even the current needs. Thus, the problem of the supply of candidates, could be potentially traced back to the educational system (formal and informal) and the lack of structural solutions offered by the companies and the government. Nonetheless, if the government and companies are not able to create a sustainable strategy for education or supply of qualified employees, it will be an even bigger problem for the ICT Industry itself (continuous growth of wages and losing the competitive advantage) and also will cannibalize all other industries because all potential employees would be interested in working in ICT where the salaries are significantly higher.

In 2019 there were a total of 15,093 employees within the ICT Industry, up from 10,975 in 2016 with total growth of 37% and the average yearly growth of nearly 10%. The average absolute number per year is 1,373 employees from which (concluded in the detailed analysis in this report) most of the jobs are created in the "Software and IT Services" subsegment.

CHART B.03
Number of Employees in ICT Industry



Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

The number of employees should reach 17,767 by 2021 with a growth of nearly 70% compared to 2016 if the previously projected growth continues.

CHART B.04
Salaries and employee related expenses

	Salaries and salary allowances (net)	Wage tax and salary compensations	Compulsory Social Security Contributions	Other employee related expenses	Employee Related Expenses without Net-Salary (total)	Employee Related Expenses with Net-Salary (total)
2016 Y.	82.60	8.29	29.84	11.51	49.63	132.23
2017 Y.	92.71	9.21	33.26	12.97	55.44	148.15
2018 Y.	108.51	11.00	39.46	15.05	65.51	174.02
2019 Y.	124.40	12.68	45.40	17.21	75.30	199.69
2020 (est.)	138.33	14.14	50.59	19.12	83.85	222.18
2021 (est.)	153.54	15.79	56.37	21.16	93.32	246.86

The total Employee Related Expenses (with Salary and Salary Allowances) in 2019 for all employees in the ICT Industry were 199.69 million euro up from 132 million in 2016. If the trend continues, these expenses will reach 246 million by 2021 or 86% higher compared to 2016, which is highly positive.

The Salaries and Salary Allowances (Net-Salary from Employees Perspective) are 124 million euro in 2019, while they will reach 153 million in 2021. The Employee Related Expenses (Tax, Contributions, and Other Employee Related Expenses) are reaching 75 million in 2019 and projected on 93 million in 2021. or 37% of total employee expenses. In the detailed analysis about the salary in this part of the report for comparison between the subsegments and sectors within the ICT Industry for clarifying the differences between the expenses and average values per employee.

B. ICT INDUSTRY PERFORMANCE
B4.2 EMPLOYEE RELATED PERFORMANCE

TABLE B.03
INDICATORS PER EMPLOYEE

BASIC PER EMPLOYEE INDICATORS	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 (est.)	2021 (est.)
Economically Active Companies (income above 1 euro)	1,296	1,540	1,665	1,957	2,177	2,390
Number of Employees	10,975	12,836	13,859	15,093	16,466	17,676
Average Number of Employees	8.47	8.34	8.32	7.71	7.46	7.17
Average Revenue Per Employee	68,482	62,560	61,402	58,282	54,882	52,322
Average Expenses Per Employee	64,846	56,093	54,576	51,168	46,609	43,448
Average Profit Per Employee	5,386	5,468	6,729	6,875	7,372	8,006
Average Employee Related Expenses per Employee	12,048	11,542	12,556	13,231	13,494	13,966
Average Net-Salary (Salary and Salary Allowances) per Employee	7,526	7,223	7,830	8,242	8,401	8,686
ADDITIONAL INDICATORS						
Share of Average Employee related Expense in Average Expenses per Employee	19%	21%	23%	26%	29%	32%
Estimated Monthly salary in ICT Industry (Average Net-Salary/12)	627.18	601.90	652.47	686.84	700.09	723.96

Note: the ICT segments which are part of the financial analytics, are not the same one used by the State Bureau for Statistics, thus the indicators such as salary (gross and net) are different

To have a better overview and comparison of the segment, all financial indicators as revenue, expenses, and profit are brought down on a single employee level. The results are showing that there are several different trends which could be observed and analyzed. With the huge expansion of the number of companies (51% growth 2016 – 2019) and limited growth of supply of qualified workforce, start-up endorsement activities, the average number of employees per company is expected to decline from 8.47 to 7.71 by 2019 and additionally 7.17 in 2021. As an absolute number, a decline of 0.68 employees per company is not much but that's nearly 10%, which means that the newly opened companies are employing fewer individuals, so they are downsizing the whole average of the industry which is expected.

The growth of the economically active companies and employees is dispersing the revenue and expenses, thus the average employee related indicators are decreasing *(the number of companies and employees is growing with higher rate compared to the revenue and expenses)*. The revenue has dropped from 68,482 to 58,282 euro per employee between 2016 and 2019 and probably will continue so down to 52.322 euro until 2021. The Expenses, are dropping at a higher rate compared to the revenue, which is positive because there is probability that the companies are optimizing their activities and allowing them to have higher net-profit (which is the case). In an alternative where the opening of new companies will slow down allowing the current ones to absorb the available workforce, there will be stabilization of the average number of employees and stagnation of the revenue and expense, thus optimizing the activities even more and with that insuring higher profit.

The "Average Profit per Employee" as mentioned before is the most positive indicator that can be seen growing for 26.5% between 2016 – 2019 from 5,386 euros in 2016 to 6,875 euros by 2019 and if the trend continues in future it will reach 8,006 euro. It is very important to stress that the profit per employee will be 93% of the yearly net salary (8,006 euros compared to 8,686 euros) or one employee will earn the same amount of cash for the company as he/she is taking per year. Given the fact that the employees are the largest asset especially for the IT Segment and its main "Software and IT Services" sub-segment, and the lack of qualified employees, the companies will probably "sacrifice" part of the profit for allowing higher salaries.

As for the Average Employee Related Expenses, they have insignificant growth from 12,048 in 2016 to 13,494 euro by 2019 and reaching nearly 14,000 euro until the end of 2021. The average share of "Employee Related Expenses per Employee" in "Average Expenses per Employee" is 19% in 2016 and reaching 26% in 2019, but the growth is mainly due to lower revenue per employee and growth of the employee-related expenses. If the trend continues the share will grow up to 32%. Still, as mentioned before there is a potential of an additional increase in the salaries in the whole ICT Industry, thus the share will grow even higher. In some sectors as "Software and IT Services" for example, the share of employee-related expenses in the total expenses of the company is 55% which is directly suggesting that the employees are the biggest asset of the companies.

Still, this analysis is very general, on an industry level and is allowing us to get a glimpse into the bigger picture. Below is a detailed analysis first on the ICT industry segments (IT and Telecommunication) the subsegments ("Software and IT Services") and in detail for the sectors (example "Computer Programming").

B. ICT INDUSTRY PERFORMANCE

B5.1 AVERAGE SALARIES (STATISTICAL DATA)

Another very important official source for the average salaries is State Statistical Office, where all salaries are recorded for different industries and segments. When comparing the current statistical data and the one gathered from the financial statements, there is possible discrepancy between the salary's records, due difference in data recording type and interpreting the working positions. Still, the official data is enabling comparation with the other industries and subsegments, thus, to prove the importance of how the creation of positive business environment in the ICT Industry can affect the salaries in the economy.

The ICT Indistry (J Information and communication) has the highest gross-salary in 2019 reaching 1,104 euros compared to the National Average of 608 euros. The average gross salary for "Computer programming, consultancy and related activities" is even higher reaching nearly 1,500 euro in the same year or more than double from the national average. The only industry that has average gross salary above 1,000 euros per month is "K. Financial and Insurance activities" reaching 1,033 euros in 2019.

Significant part of the industries or 9 (out of 19) have average gross salary below the national average. The lowest payed employees are in Manufacturing, Agriculture, Administrative and support services and Accommodation which have at least 20% lower average salaries than the national average. Compared to "Computer programming...." the employees for example in "Manufacturing" have on average 3 times lower gross salaries or the ones in "Accommodation and food service activities" have 3.5 times lower.

From one stand point the defined difference between the salaries can be seen as privilege for the employees in the ICT Industry, but from another, if there is stable and improved business environment for the same industry the national average salary will increase even more. That of course will increase the pressure and for rising the wages in other industry segments as well. **Subjective opinion:** The salaries spent from IT Employees in the domestic economy would result with increased income for the local businesses, increased salaries for the employees in the local businesses. Increase in number of employees in the ICT Industry will directly and positively affect all other industries thus the economy. Additionally it is expected that the average salary per employee in the "Software and IT Services" subsegment to increase even more in the following years.

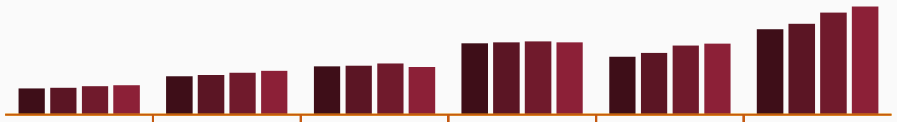
TABLE B.04
INDUSTRIES AVERAGE GROSS-SALARY (monthly)
values In euro

	2016 Y.	2017 Y.	2018 Y.	2019 Y.	% of Nat Av.
NATIONAL AVERAGE	**533.68**	**547.76**	**579.28**	**608.92**	**100%**
62. COMPUTER PROGRAMMING, CONSULTANCY AND RELATED ACTIVITIES	**1181.29**	**1258.38**	**1413.23**	**1493.28**	**245%**
INDUSTRY					
J Information and communication	874.22	919.14	1057.75	1104.66	181%
K Financial and Insurance activities	958.21	975.42	999.77	1033.58	170%
D Electricity, gas, steam and air conditioning supply	902.94	903.29	926.50	949.52	156%
B Mining and quarrying	631.66	694.33	818.53	835.25	137%
Q Human health and social work activities	587.46	597.79	641.15	712.17	117%
M Professional, scientific and technical activities	680.97	692.57	680.55	710.28	117%
S Other service activities	628.60	654.45	684.25	705.70	116%
O Public administration and defense, compulsory social security	644.44	654.48	671.74	697.46	115%
L Real estate activities	575.55	582.14	634.88	634.28	104%
H Transportation and storage	550.37	573.51	553.98	610.89	100%
P Education	532.85	535.22	562.14	593.12	97%
F Construction	505.08	495.19	525.15	563.63	93%
G Wholesale and retail trade, repair of motor vehicles and motorcycles	481.45	503.40	535.26	552.44	91%
R Arts, entertainment and recreation	496.68	512.34	527.67	534.54	88%
E Water supply, sewerage, waste management and remediation activities	474.20	481.23	495.66	511.97	84%
C Manufacturing	405.01	429.73	477.25	508.25	83%
A Agriculture, forestry and fishing	398.59	415.36	451.74	480.75	79%
N Administrative and support service activities	389.67	395.05	423.18	453.14	74%
I Accommodation and food service activities	365.58	381.18	420.02	437.01	72%

Source: State Statistical Office – www.stat.gov.mk
Note: % of National Average is the ratio between the salary in the industry vs. the national average salary:

B. ICT INDUSTRY PERFORMANCE
B5.2 AVERAGE SALARIES (STATISTICAL DATA)

CHART B.05
XX. Average (yearly) net and gross salaries
Period: 2016 - 2019
values in euro



	National		Telecommuniaciton		Computer programming, consultancy and related activities	
2016	4,357	6,404	8,002	11,831	9,643	14,175
2017	4,474	6,573	8,142	12,023	10,266	15,101
2018	4,739	6,951	8,488	12,138	11,476	16,959
2019	4,920	7,307	7,894	12,000	11,782	17,919

Source: State Statistical Office – www.stat.gov.mk

TABLE B.05
SALARY GROWTH 2016-19

Segment		2017	2018	2019	General Growth	Average Growth
National	Net	2.67%	5.93%	3.82%	12.92%	4.14%
	Gross	2.64%	5.76%	5.12%	14.10%	4.50%
Telecommunication	Net	1.75%	4.25%	-7.00%	-1.36%	-0.34%
	Gross	1.62%	0.96%	-1.13%	1.43%	0.48%
Computer programming, consultancy and related activities	Net	6.46%	11.78%	2.67%	22.19%	6.97%
	Gross	6.53%	12.31%	5.66%	26.41%	8.17%

Source: State Statistical Office – www.stat.gov.mk

To get a closer look of the salaries recorded by the State Statistical Office of North Macedonia, the salaries between the National average, Telecommunication and Computer programming are compared. The average National salary by 2019 is 7,307 euros (gross) or nearly 2.5 times lower than the one in "Computer programming, consultancy and related activities" where in the same year was 17,919 euros. The Telecommunication segment is somewhere between the two values reaching 12,000 euros in 2019. The salaries in "Computer programming.." are growing with significantly higher than the National Average reaching double digits in 2018 both for gross and net salary. On other side, the "Telecommunication" segment has insignificant oscillation of +/-1.5% in the same period.

When analyzing the salaries, there is one important information about the intervention of the Government in setting the lower threshold for the salary or the minimum wage in 2019 on 250 euros (net). The industries which are labor intensive, mainly in manufacturing, before minimal wage increase, were paying the employees less than 250 euros, so the companies within those industries were seriously affected by this "intervention". The problem is accruing because now the companies have to pay significantly higher salaries without any increase in the productivity, thus the expense is higher than before. The unnatural growth of the minimal wage is increasing the National Average also. **This is very important, because the salaries in the ICT Industry have natural growth (or partially natural because the lack of workforce is pressuring the wages also) so in comparation with the National Average the growth rate is even higher in the analyzed period.**

The only decrease in the growth for the salary in the "Computer programming...." subsegment is in 2019 where the (from unofficial data) the introduction of the progressive taxation was responsible for this setback. To certain degree the taxation is explaining why the Gross salary growth in the same year is the highest (due higher taxation), but the net salary has lower growth rate than the National Average. Still, the return of the flat taxation (10% corporate and personal tax) the salaries in the Computer programming segments will continue to grow in the next few years with high probability.

Even the average yearly growth is oscillating, the general growth from 2016 to 2019 of the salary in "Computer programming, consultancy..." is 22.19% of the net and 26.41% for the gross. It is nearly double compared to the growth of the national average and significantly higher than the stagnant salary in "Telecommunication".

B. ICT INDUSTRY PERFORMANCE

B6.1 SIMULATION – THE IMPACT OF ADDITIONAL REVENUE

As is known, that one of the biggest benefits from working in the "Software and IT Services" subsegment, is the salary which for part of the professions (as Programmer) the highest in the Macedonian economy. Thus there is a need to define how significant are the expenses and the expenses related to the employees in the revenue, and what can be expected from every additional 1 euro of revenue in the relation of wages. In other words, to break down on basic components that 1 euro, and later extrapolate the given shares on larger revenues (Simulation).

In Table B.05, the total expenses and expenses related to employees are correlated with the revenue in the three segments which had the biggest revenue from 2016 to 2019. The difference between them and the share of the employee-related expenses in total income is significant in "Software and IT Services" reaching high 44% in 2016 and growing up to 47.7% in 2019. If the trend continues the share of the employee-related expenses in total revenue will reach nearly 50%. Simply explained for every additional 1-euro income, the employees will get 0.5 euro as gross salary. The other subsegments, on the other hand, have a significantly lower share of employee-related expenses reaching the highest 12.3% of income for Telecommunication and 10.0% for IT Trade & Manufacturing. Both segments have a decrease in the employee-related costs in total cost structure, where in trade and manufacturing is going down to 8.9%. Even they are not analyzed for the current report, the cost structure of various industries and industry segment, is similar to the ones calculated for "Telecommunication" and "IT Trade and manufacturing".

Subjective perspective: the share of employee-related costs of 50% in total revenue is outstanding and cannot be met in other industries even within other service industries. Of course, there are exceptions in other industries, but the average is calculated on more than 1,100 economically active companies which means that for "Software and IT Services" its not exception but the rule.

If the average employee-related expense per employee is compared between the same segments in 2016 wasn't as pronounced but in 2019 is nearly 2,800 euro or 22% higher per employee. The individuals who are employed in "Software and IT Services" are as twice as paid from the ones in "IT Trade & Manufacturing". The average (gross) salary in North Macedonia (for December for every analyzed year) by 2019 is 7,791 euro, the employees in "Software and IT Services" subsegment have nearly 100% higher than the average, and the trend will continue until 2021.

TABLE B.06
SHARE OF EXPENSES AND EMPLOYEE RELATED EXPENSES IN TOTAL REVENUE

	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Software and IT Services						
% of expenses in revenue	90.1%	84.3%	86.5%	84.6%	83.7%	83.6%
% of employee related expenses in revenue	44.0%	45.1%	46.3%	47.7%	48.3%	48.9%
Telecommunication						
% of expenses in revenue	96.6%	91.3%	86.8%	86.7%	83.6%	81.3%
% of employee related expenses in revenue	11.3%	12.3%	11.6%	11.1%	11.1%	10.7%
Trade & Manufacturing						
% of expenses in revenue	94.8%	92.0%	93.7%	93.3%	92.7%	93.0%
% of employee related expenses in revenue	10.0%	9.7%	9.0%	8.9%	8.4%	8.0%

Note: *Only three segments are shown, because they have large revenue and expenses, thus they are enabling the comparation to be done. The % of employee related expenses is also incorporated in % of expenses in revenue;*

TABLE B.07
EMPLOYEE RELATED EXPENSES PER EMPLOYEE
Values in euro

PER YEAR (GROSS)	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est)	21 Y. (est.)
Software and IT Services	13,269	13,936	14,603	15,280	15,629	15,957
IT Trade	9,264	8,501	7,861	7,218	6,577	5,935
Telecommunication	12,961	12,827	12,707	12,563	12,443	12,314
PER MONTH						
Software and IT Services	1,106	1,161	1,217	1,273	1,302	1,330
IT Trade	772	708	655	602	548	495
Telecommunication	1,080	1,069	1,059	1,047	1,037	1,026
AVERAGE SALARY (GROSS)						
Monthly	558	569	613	649	679	716
Yearly	6,707	6,832	7,356	7,791	8,153	8,593

B. ICT INDUSTRY PERFORMANCE
B6.2 SIMULATION – THE IMPACT OF ADDITIONAL REVENUE

To emphasize the importance for development and structural support of the "Software and IT Services" subsegment, in Table B.07 a simple projection for answering the question "What is the added value of additional revenue of 1-million-euro in the analyzed segments?" is created. It is based on the previously calculated shares of the expenses and employee-related expenses in total revenue. The most important information is the additional number of employees could potentially be employed if the segment receives an additional 1 million in revenue and how much income would be generated for taxes (personal and corporate tax).

From the projection, there is a significant difference between the "Software and IT Services" and the other two segments. If additional 1-million-euro revenue is generated in the "Software and IT Services" subsegment it will allow potential employment of 31 new employees with the current average salary (employee-related costs) which are as calculated 22% higher than the ones in Telecommunication or 110% compared to "Trade and Manufacturing". The same income in the "Telecommunication" segment will produce an additional 9 new employees and 12 new employees for "Trade and Manufacturing". For each additional 1 million revenue, "Software and IT Services" is generating nearly 200% more additional positions than other segments and industries which is highly positive.

Simulation explanation

The calculation is simplified to enable a comparison between the segments. The average rate of wage-related costs as Wage Tax and Salary Allowances, Compulsory Social Security Contributions, Health Insurance, and Other employee-related expenses are 47% - 48% above the net-salary. From which 10% is Personal Tax (same as corporate).

The expected TAX (Personal and Corporate) is the sum of the potential net profit (Total Income – Total expenses * 10%) and Wage Tax (Employee Related Expenses / 1.47 * 10%). Employee related expenses are divided by 1.47 (47% before mentioned expenditures) to calculate the basis (net-salary) on which all cost positions are added among them the Wage Tax of 10%.

The share of expenses projection (total and employee-related) is based on the previous Table C3.01 – "SHARE OF EXPENSES AND EMPLOYEE RELATED EXPENSES IN TOTAL REVENUE" and the average Employee Related Expenses are from the previous calculations.

Note: The calculations are not 100% accurate, there is a potential of +/-5% oscillation. The projections for 2020 and 2021 are based on the previous calculation of employee-related expenses and revenues.

TABLE B.08
SIMULATION FOR ADDITIONAL 1 MILLION EURO INCOME BY SUBSEGMENT
All values are in euro except number working positions

TOTAL INCOME	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Software and IT Services	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**21 Y. (est.)**
Total Expenses	900,673	843,336	864,531	845,659	836,765	835,558
Employee Related Expenses	439,804	450,532	462,741	476,653	482,610	488,502
Employee Related Expenses Per Employee	13,269	13,936	14,603	15,280	15,629	15,957
Newly generated working positions	33	32	32	31	31	31
Expected TAX (Personal and Corporate)	39,851	46,315	45,026	47,859	49,154	49,676
Compulsory Social Security Contributions and Other Employee Related Expenses (State Income)	118,779	121,676	124,974	128,731	130,340	131,931
Total state related expenses	158,630	167,991	170,000	176,590	179,494	181,607
Telecommunication	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**21 Y. (est.)**
Total expenses	966,175	913,010	868,489	866,993	836,308	812,762
Employee Related Expenses	112,501	123,269	116,059	111,481	111,165	107,449
Employee Related Expenses Per Employee	12,961	12,827	12,707	12,563	12,443	12,314
Newly generated working positions	9	10	9	9	9	9
Expected TAX (Personal and Corporate)	11,036	17,085	21,046	20,884	23,931	26,033
Compulsory Social Security Contributions and Other Employee Related Expenses (State Income)	30,383	33,292	31,344	30,108	30,023	29,019
Total state related expenses	41,419	50,376	52,391	50,992	53,954	55,052
IT Trade & Manufacturing	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**21 Y. (est.)**
Total expenses	947,880	919,876	937,169	932,974	927,407	930,373
Employee Related Expenses	99,777	96,588	90,144	88,548	84,356	79,539
Employee Related Expenses Per Employee	9,264	8,500	7,860	7,218	6,576	5,934
Newly generated working positions	11	11	11	12	13	13
Expected TAX (Personal and Corporate)	11,999	14,583	12,415	12,726	12,998	12,374
Compulsory Social Security Contributions and Other Employee Related Expenses (State Income)	26,947	26,086	24,346	23,915	22,782	21,481
Total state related expenses	38,946	40,669	36,761	36,641	35,780	33,855

B. ICT INDUSTRY PERFORMANCE

B6.3 SIMULATION – THE IMPACT OF ADDITIONAL REVENUE

The second very important information from the simulation is the expected tax income (corporate and personal) as well as contribution and other wage-related expenditures from which the state and its institutions would benefit. Because 2019 is the last year for which historical data is available, the conclusions would be made initially for the same year. It should be stressed that the employees in the "Software and IT Services" subsegment have at least a 22% higher salary than the ones in "Telecommunication" and 100% higher salary compared to the average in North Macedonia. The projected tax is only the direct one or the one that can be directly calculated or Personal and Corporate (for the period is still in power the Flat-Taxation of 10%). The employees are spending their salaries mostly in the domestic economy mostly in local businesses, so higher the net-salary is the higher the benefit is for the local business and the economy as well. **Additionally, the cash which is spent by the companies on using services and products from other companies is suggesting that the expected economic impact is significantly higher. If the multiplier is pessimistically only 2 (in some industries is reaching 7), the initial expenses of only 845,659 euros are creating nearly 1.7 million euros for the economy.**

Note: because there is too much information within the simulation, every sector will be analyzed separately, and then compared.

Multiplier effect (explanation): When a change in spending leads to a much larger change in real GDP than the initial change. For example, if an employee initially spends 100 euro in local business, and that change in spending leads to real GDP increasing by 200 euro than the multiplier effect has multiplied the initial spending (impact) 2 times, because the small business is continue spending the same 100 euros in the local economy (purchasing supplies, salaries for employees etc.)

Software and IT Services. From the simulation, the additional 1 million revenue will generate additional 31 work positions which will get 476,654 **euro (gross) as salaries or on average 15,280 euros per employee**. The tax will be (Personal and Corporate) 47,859 euros and additional 128,731 euros for Compulsory Social Security Contributions, Health Insurance, and Other employee-related expenses. The total potential state-related expenditures are 176,590 euros or 17% of 1 million in revenue.

Telecommunication. The second analyzed segment with 1 million additional will generate 9 work positions which will get 111,481 euros (gross) as salaries per year or on average 12,563 euros per employee. The tax will be (Personal and Corporate) 20,884 euros and additional 30,108 euros for Employee related expenses (above net-salary). The total potential state-related expenditures are 30,108 euros or 3.0% of 1 million in revenue.

Trade & Manufacturing. Additional 1 million revenue in the segment of trade in manufacturing will generate 12 work positions which will get 88,548 euro (gross) as salaries or on average 7,218 euros per employee. The tax will be (Personal and Corporate) 12,726 euros and an additional 23,915 for Compulsory Social Security Contributions, Health Insurance, and Other employee-related expenses. The total potential state-related expenditures are 36,641 euros or 3.6% of 1 million in revenue.

If the three subsegments are compared, it's easy to conclude that "Software and IT Service" is by far the best for managing and spending the additional 1 million revenue. It creates 200% more new positions, 300% - 400% more revenue for the state through taxes, and other employee-related expenses and the employees are getting the highest salary in the economy (100% higher than the average salary in North Macedonia – Source: State Bureau for Statistics). In this report are not analyzed, but other industries and industry segments have a similar structure of costs and shares of employee-related expenses like the ones calculated in "Telecommunication" and "IT Trade & Manufacturing", thus the "Software and IT Services" is outperforming nearly all other industries. If that number is extrapolated on 100-million-euro additional revenue, there will be 3,100 new work positions in "Software and IT Services" compared to 1,100 in the other analyzed industries. A higher number of employees in the "Software and IT Services" subsegment is also directly affecting the average salary on the national level and GDP.

The benefits from strategic development are numerous, still, about "Software and IT Services" there is a huge setback when it comes to a qualified workforce. As shown in the analysis, only this subsegment of the IT Industry requires on average 1,200 new employees every year (natural growth), not taking the fact that IT (Programmers, System Engineers, etc.) professionals are needed nearly in every company in every segment. On the other side, the supply from formal education (graduated students) is 685 students per year, which means that there is a huge "hole" in the supply and that's the reason why even undergraduate students are already employed before finishing the formal education. If the Government wants to avail the benefits from "Software and IT Services" and the companies to grab the huge potential on the global market, first and foremost they should create a strategy for the development of formal and potentially informal education (more about the education) to meet the labor market requirements.

ICT INDUSTRY DETAILED ANALYSIS

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.1 GENERAL SUBSEGMENT ANALYSIS

Going deeper into the performance of the ICT Industry is allowing us to define the segments and subsegments which are bearing the development. The IT Subsegment – "Software and IT Services" is leading the growth of active companies with 55% comparing 2019 to 2016. The subsegment "Other IT" which includes the sectors of "Web portals" and "Repair of computers and peripheral equipment" has also an impressive growth of 300%. As expected, the "IT Trade" subsegment is also consistent with a large number of active companies reaching 529 in 2019.

The revenue analysis is enabling to observe a very specific and important trend. In 2016 the "Software and IT Services" subsegment is third by revenue and expenses, but by 2019 is second, generating more revenue and expenses than the IT Trade which is highly positive. Also, the same subsegment is by far the larger employer from all ICT Industry with 8,570 with an average growth of 1,200 employees per year, which is suggesting that in near future will be one of the leading segments by performance in the Macedonian economy. Even with small growth in the revenue in the period 2016 - 2019, the Telecommunication segment is the largest between the segments/subsegments with 348 million in 2016 and 368 in 2019. Nonetheless, If all subsegments follow the growth as in the previous 4 years, there is a real possibility the "Software and IT Services" to get the lead in revenue and expenses until the end of 2021.

The growth of expenses, especially in "Software and IT Services" should be also seen as positive, because nearly 55% of total expenses are employee-related, thus the growth means more employees, higher salaries, and employee-related expenses. Analyzed from the macro economical perspective, more employees and higher salaries in this subsegment are stimulating higher spending in the local economy, so improving not only the ICT Industry but all other industries in which that money is spent.

As mentioned before, the "Software and IT Services" subsegment is by far the largest employer with 8,478 or more than 5,000 from the second "Telecommunication" segment with 3,307 employees. On the third position is IT Trade with 2,570 in 2019. If the trend continues, the "Software and IT Services" subsegment will employ more than 10,700. As analyzed in the previous slides, in an alternative where the Government and the Companies manage to improve the supply of qualified workforce through informal and formal education, the number of employees could be even higher in the next few years.

TABLE B.09
ICT SUBSEGMENTS GENERAL INDICATORS

Number of economically active companies	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**2021 Y. (est.)**
Software and IT Services	714	841	950	1,105	1,235	1,366
IT Trade	424	484	494	529	564	590
IT Manufacturing	13	13	13	20	22	25
Telecommunication	104	113	115	123	129	134
Other IT	41	89	93	180	226	272
Total	1,296	1,540	1,665	1,957	2,177	2,390

Revenue Analysis In million ('000 000) euro	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Software and IT Services	151.96	194.51	229.21	272.99	313.34	352.94
IT Trade	234.27	237.71	250.51	213.19	206.16	195.65
IT Manufacturing	13.07	11.79	13.88	14.25	14.64	15.59
Telecommunication	348.38	352.65	351.14	368.61	375.35	382.92
Other IT	3.90	6.37	6.24	10.61	12.84	15.00
Total	751.59	803.02	850.97	879.65	922.34	965.97

Expenses Analysis In million ('000 000) euro	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Software and IT Services	136.87	164.04	198.16	230.86	262.19	294.91
IT Trade	222.63	218.58	234.78	199.29	191.51	182.49
IT Manufacturing	11.83	10.93	13.00	12.90	13.26	14.04
Telecommunication	336.59	321.97	304.96	319.58	313.91	311.23
Other IT	3.77	4.49	5.48	9.65	11.61	13.98
Total	711.69	720.01	756.37	772.28	792.48	816.64

Number of employees	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Software and IT Services	5,012	6,257	7,227	8,479	9,635	10,761
IT Trade	2,451	2,625	2,820	2,570	2,610	2,605
IT Manufacturing	216	213	214	221	223	226
Telecommunication	3,048	3,419	3,242	3,307	3,393	3,385
Other IT	248	322	356	516	605	700
Total	10,975	12,836	13,859	15,093	16,466	17,676

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.2 GENERAL SUBSEGMENT ANALYSIS

Also from the Net-Profit and Net-Profit Margin indicators, several trends can be analyzed. In 2016 the "Software and IT Services" subsegment is third by revenue, second by profit with 17 million and first by a net profit margin of 11.7%. Until 2019 it reached 41.91 million in euro and if the same trend continues in the next 2 years, this subsegment will reach the "Telecommunication" segment both by Net-Profit and Revenue. The "IT Trade" subsegment has stagnant net-profit on average with 14 million euro from 2016 – 2019 and net-profit margin of 5.7% - 6.3%, but considering the current COVID-19 crisis and the impact that it had on the Retail segment (IT and Communication Equipment), there is potential for downfall of the revenue and net-profit of this subsegment. At this moment it is hard to project what the exact impact will be, but it should be mentioned as a very important factor for 2020.

Also, there are companies that have accounted for financial loss in the previous 4 years which is expected because it is a natural part of the companies to go bankrupt, close, or have a negative financial outcome. The loss is severe in 2016 where is topping 27 million or nearly half the profit in the same year. After 2017, the loss is stabilizing on average of 9 million and from the projection it will continue in the same amount in the next 2 years. Analyzed by subsegments, the reason for 2016's downfall is the" Telecommunication" segment, because it accounts for 19 million loss or 70% of total financial loss for the year.

One of the most important financial indicators is "Expenses related to Employees" and its trend, because that's the number of financials which is available for the private expenditure of the employees, and the amount the state is getting trough taxation and other related costs. Even in 2016, where the "Software and IT Services" subsegment is third by revenue and expenses, expenses related to employees are the first with 66.8 million versus the 39.2 million of Telecommunication. 48.5% of the total expenses in "Software and IT Services" are employee-related compared to the 11.6% in Telecommunication (Employee Related Expenses/Total Expenses). In continuation of this report, a detailed analysis of the employee-related expenses is done.

For the end of the current analysis, the Net-Margin is growing for nearly every subsegment (with different rates). The largest is accounted for in "Software and IT Services" which will reach 16.5% in 2021 if the trend from 2016 to 2019 continues. Significant growth could be also observed in the Telecommunication segment from 7.6% in 2016 to 12.5%, potentially reaching 15.7% by 2021.

TABLE B.10
ICT SUBSEGMENT GENERAL INDICATORS

Net-Profit In million ('000 000) euro	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Software and IT Services	17.73	24.63	32.78	41.91	49.96	58.41
IT Trade	13.48	13.63	15.21	13.44	13.43	13.36
IT Manufacturing	1.16	0.78	0.77	1.27	1.31	1.49
Telecommunication	26.46	30.61	43.68	46.10	52.64	59.98
Other IT	0.27	0.55	0.82	1.05	1.31	1.57
Total	59.11	70.19	93.26	103.77	118.65	134.80

Financial Loss In million ('000 000) euro	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**2021 Y. (est.)**
Software and IT Services	4.66	2.97	4.75	4.29	4.16	4.56
IT Trade	3.29	1.15	0.96	1.03		
IT Manufacturing	0.03	0.04	0.00	0.06	0.07	0.08
Telecommunication	18.96	5.57	3.05	3.08	2.25	1.14
Other IT	0.18	0.15	0.15	0.19	0.20	0.22
Total	27.12	9.88	8.91	8.65	6.95	5.97

Expenses related to Employees In million ('000 000) euro	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**2021 Y. (est.)**
Software and IT Services	66.8	87.6	106.1	130.1	151.2	172.4
IT Trade	18.0	19.7	21.6	20.0	20.7	21.0
IT Manufacturing	6.7	4.4	2.3	0.1		
Telecommunication	39.2	43.5	40.8	41.1	41.7	41.1
Other IT	3.3	3.7	3.4	3.9	4.0	4.1
Total	134.0	158.9	174.0	195.2	215.6	234.5

Net-Margin	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est)**	**2021 Y. (est.)**
Software and IT Services	11.7%	12.7%	14.3%	15.4%	15.9%	16.5%
IT Trade	5.8%	5.7%	6.1%	6.3%	6.5%	6.8%
IT Manufacturing	8.9%	6.6%	5.5%	8.9%	9.0%	9.6%
Telecommunication	7.6%	8.7%	12.4%	12.5%	14.0%	15.7%
Other IT	7.0%	8.6%	13.1%	9.9%	10.2%	10.4%

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.A1 SOFTWARE AND IT SERVICES SUB-SEGMENT GENERAL PERFORMANCE

In 2019 there are 1,234 registered companies from which 1,108 are active with income above 1 euro. The number of active companies has exceptional growth with 55% between 2016 – 2019 or average of 16% in the same period. The total revenue in 2019 is 272 million euros with a growth of 80% (2019 compared to 2016) and average of 22.4% (2016-2019). The total Expenses were 230 million euros in 2019 with a growth of 69% and an average rate of 19%. The difference between the growth of the revenue and Expense of 11% is positive because it means that the companies are optimizing their activities and Expenses and thus, if the trend continues in future, higher profit and available financials for future development and investment. Also, one of the most important indicators for how the ICT industry is performing is the Operating income which has 179% growth in just 4 years or an average of 20% growth rate per year from 15 million in 2016 to 42 million in 2019. That is highly positive because it indicates that the companies have a significant operating margin from their primary activities (business) and again serious financial assets for current and future investment.

The net-profit is following the growth of the operating income, from 17.33 million in 2016 to 41.91 million euro in 2019, and average Net-Profit Margin from 12% – 15%. Naturally, the operating income should be higher from the net-profit (at least for the taxation), but part of the companies have income from additional sources as investments in other companies or in financial instruments (especially in 2016). Nonetheless, the net profit margin is reasonably high. The net profit per employee has grown for 40% in the past 4 years from 3,520 euro to 4,920, which, considering that 55% of total expenses are employee-related, is suggesting that in near future, further growth in wages can be expected within the sub-segment (potentially higher than the one calculated).

Within the sub-segment, there is a total of 8,516 employees for which more than 129 million euro are spent (in salaries and related Expenses). There is a steady increase of 1,100 – 1,200 employees per year which is a clearly larger number than total graduated students on IT Technologies, and in a certain amount, it's explaining why under-graduate students are already employed before completing the faculty. The Average Employee expenses Per Employee has grown 15% from 13,268 euros to 15,279 euros or on average 5% per year. The average income per employee has a low 6% growth compared to other criteria. On the other side, the average Expenses per employee are nearly the same in the past several years. It can be concluded as before, that the companies are optimizing all other Expenses, except the salaries of the employees because even with a 15% increase of direct employee-related costs, the total Expenses per employee is stagnant in the past 4 years.

TABLE B.11
GENERAL SOFTWARE AND IT SERVICES SUB-SEGMENT PERFORMANCE

Criteria	2016 Y.	2017 Y.	2018 Y.	2019 Y.	General Growth (2019/16)	Aver. Growth (2017 - 2019)
Number of Active Companies	715.00	845.00	957.00	1,108.00	55%	16%
Revenue (in million)	151.96	194.51	229.21	272.99	80%	22%
Expenses (in million)	136.87	164.04	198.16	230.86	69%	19%
Operating Income (in million)	15.09	30.47	31.05	42.13	179%	46%
Operating Margin	10%	16%	14%	15%	55%	19%
Net-Profit (in million)	17.73	24.63	32.78	41.91	136%	33%
Financial Loss (in million)	4.66	2.97	4.75	4.29	-8%	5%
Net-Profit Margin	12%	13%	14%	15%	32%	10%
Number of employees	5,037	6,288	7,263	8,516	69%	19%
EMPLOYEE RELATED INDICATORS						
Employee Related Expenses (in million)	66.83	87.63	106.06	130.12	95%	25%
Employee Related Expenses Per Employee	13,268	13,936	14,603	15,279	15%	5%
Average Income Per Employee	30,169	30,933	31,558	32,056	6%	2%
Average Expense Per Employee	27,172	26,087	27,282	27,108	0%	0%
Average Net-Profit Per Employee	3,520	3,916	4,513	4,920	40%	12%

Note: All values are in euro
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

SOFTWARE AND IT SERVICESES SECTORS (NACE Classification)

58.21 Publishing of computer games; 58.29 Other software publishing; 62.01 Computer programming activities; 62.02 Computer consultancy services; 62.03 Computer facilities management activities; 62.09 Other information technology and computer service activities; 62.11 Data processing, hosting and related activities;

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.A2 SOFTWARE AND IT SERVICES SUB-SEGMENT FUTURE PERFORMANCE

TABLE B.12
GENERAL SOFTWARE AND IT SERVICES SUB-SEGMENT PERFORMANCE

Software and IT Services	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est)	2021 Y. (est.)
Number of Active Companies	715.00	845.00	957.00	1,108.00	1,282.38	1,473.76
Revenue (in million)	151.96	194.51	229.21	272.99	313.34	352.94
Expenses (in million)	136.87	164.04	198.16	230.86	262.19	294.91
Operating Income (in million)	15.09	30.47	31.05	42.13	51.15	58.04
Operating Margin	10%	16%	14%	15%	16%	16%
Net-Profit (in million)	17.73	24.63	32.78	41.91	49.96	58.41
Financial Loss (in million)	4.66	2.97	4.75	4.29	4.16	4.56
Net-Profit Margin	12%	13%	14%	15%	16%	17%
Number of employees	5,037	6,288	7,263	8,516	9,676	10,805
EMPLOYEE RELATED INDICATORS						
Employee Related Expenses (in million)	66.83	87.63	106.06	130.12	151.22	172.41
Employee Related Expenses Per Employee	13,269	13,936	14,603	15,280	15,629	15,957
Average Revenue Per Employee	30,170	30,933	31,558	32,056	32,384	32,665
Average Expense Per Employee	27,173	26,087	27,283	27,109	27,098	27,294
Average Net-Profit Per Employee	3,521	3,917	4,514	4,921	5,164	5,406

Note: All values are in euro except number of employees and relative numbers
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

SOFTWARE AND IT SERVICESES SECTORS (NACE Classification)

58.21 Publishing of computer games; 58.29 Other software publishing; 62.01 Computer programming activities; 62.02 Computer consultancy services; 62.03 Computer facilities management activities; 62.09 Other information technology and computer service activities; 62.11 Data processing, hosting and related activities;

Based on the data provided for the past 4 years, and the calculated average growth rates, it can be expected that the Software and IT Services sub-segment in the next 2 years 2020/21 will have nearly double the companies compared to 2016 and nearly 135% growth in revenue from 151 million in 2016 to 352 million euro in 2021.

Larger revenue in the Software and IT Services sub-segment means larger export and trade balance surplus, more employees and higher salaries and employee related Expenses. The total Expenses will grow to 294.91 million in 2021 up from 136.87 million euro in 2016. The difference between the revenue and Expenses (Operating Profit) is the maximum profit which the ICT Companies can expect or nearly 58 million in 2021 (17% operating margin), can be used for re-investment, innovation and development of the companies. The net profit will also grow up to 58 million euro with 17% net-profit margin, while the average net-profit per employee will get up to 5,430 euro until 2021.

From employee point of view, it's expected the number to increase from 5,037 to 10,805 until the end of 2021 or more than double, if the steady growth of 1,300 per year continue in the next two years. The COVID-19 crisis surely will have short-term negative effect on the employment, but ICT, especially Software and IT Services companies is expected not to be affected as other industries. Total employee related Expenses will increase to 172 million euros in 2021 from 66 million in 2016. **The share of employee related Expenses in total Expenses is nearly 57% (in 2019 y.), which compared to other industries is commonly between 15-20% and is directly imposing that the employees are the biggest asset in the ICT Industry and the most significant expense within the companies.** Considered the intense competition, lack of qualified workforce, and the challenge the companies are facing to retain their employees, this percent could be even higher in future or they will find another ways of motivation like ownership, share options etc. Employee related Expenses per employee, will increase to 15,957 until 2021 with average rate between 2% - 5%. In absolute numbers the average revenue per employee will roughly increase 2,000 euro or 2% and is larger than the salary increase of nearly 700 euro. It can be expected the salary increase to be even larger (in absolute amount) in the next two years because there is financial potential.

Based on the previous years' financials and data, there are no visible obstacles except the lack of workforce, for reducing the growth, because the companies in the ICT Export 2020 Report didn't stated that they have lack of projects or clients (even part of them have that issue).

Research Details: ICT Export 2020 Report

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.A3 SOFTWARE AND IT SERVICES SECTOR OVERVIEW

TABLE B.13
SOFTWARE AND IT SERVICES DETAILED SECTOR OVERVIEW

Software and IT Services - Revenues	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	72.74	102.16	123.89	149.94	175.68	200.19
Other IT and computer service	53.30	58.99	60.72	64.94	68.82	72.10
Computer consultancy activities	14.44	17.33	21.24	28.00	32.52	37.59
Data processing, hosting and related activities	5.91	11.78	18.96	24.72	30.98	37.38
Computer facilities management activities	5.58	4.25	4.40	4.73	4.44	4.51
Publishing of computer games	0.00	0.00	0.00	0.31	0.41	0.55
Other software publishing	0.00	0.00	0.00	0.35	0.47	0.62

Software and IT Services- Expenses	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	62.41	85.07	110.24	130.60	153.33	176.09
Other IT and computer service	50.49	53.98	56.76	59.17	62.07	64.76
Computer consultancy activities	13.94	14.58	17.51	23.96	27.30	31.54
Data processing, hosting and related activities	4.88	6.44	9.49	11.74	14.02	16.55
Computer facilities management activities	5.14	3.96	4.15	4.46	4.23	4.32
Publishing of computer games	0.00	0.00	0.00	0.60	0.80	1.07
Other software publishing	0.00	0.00	0.00	0.32	0.43	0.57

Software and IT Services – Profit	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	11.20	12.22	15.31	19.91	22.81	26.34
Other IT and computer service	3.25	5.06	4.34	5.82	6.67	7.21
Computer consultancy activities	1.42	2.18	3.60	3.95	4.80	5.67
Data processing, hosting and related activities	1.46	4.90	9.28	11.98	15.48	19.01
Computer facilities management activities	0.40	0.26	0.26	0.22	0.16	0.12
Publishing of computer games	0.00	0.00	0.00	0.01	0.02	0.02
Other software publishing	0.00	0.00	0.00	0.02	0.03	0.04

Software and IT Services - Profit Margin	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	15%	12%	12%	13%	13%	13%
Other IT and computer service	6%	9%	7%	9%	10%	10%
Computer consultancy activities	10%	13%	17%	14%	15%	15%
Data processing, hosting and related activities	25%	42%	49%	48%	50%	51%
Computer facilities management activities	7%	6%	6%	5%	4%	3%
Publishing of computer games	/	/	/	4%	4%	4%
Other software publishing	/	/	/	7%	7%	7%

Note: All values are in euro except number of employees and relative numbers;
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

In order to get the complete picture of the Software and IT Services sub-segment, it should be analyzed even deeper through its integral parts/sectors. All sectors have significant at least 100% growth between 2016 to 2019 except for "Other information technology and computer services" but even there the rate is 20%. It is very important to stress that a large number of the companies from this sub-segment are working in several sectors simultaneously (ex. Offering Computer Programming and Computer Facilities management activities), but they are classified by the services that have the largest share in the revenue. The companies that are working in "Computer programming activities" are responsible for the largest share of the revenue or 149 million in 2019 or 55% of "Software and IT Services" total revenue. "Other information technology...." has also solid revenue of 64 million in 2019, but the growth of the segment is not significant as the one of computer programming and data processing. "Data processing, hosting and related activities" even with less significant revenue of 24 million euros in 2019, has the most intense growth from 2016 to 2019 of nearly 5 times, and it is expected to continue with the same pace in the next 2 years. The growth of every "Software and IT Services" sector is very important, but the most important is "Computer programming activities" because at the moment and in near future its services are and will be of huge demand, thus this sector is affecting every aspect of the ICT Industry from average salaries to trade balance.

The Expenses are following the revenue growth, but on the positive side is that the Net-Profit is growing in absolute number, which means that even with higher expenses and serious growth, the companies are successful in maintaining the profit margin steady trough time. The net-profit margin, with exception of "Other IT and Computer Services" is positive, is exceeding 10% which is positive, but the companies which are working in the sector of "Data processing..." are accounting for 48% net-profit margin in 2018 – 19 which is very high from any aspect from business to financial. The main "Software and IT Services" sector "Computer Programming Activities" which is employing the most individuals and is responsible for the largest revenue has a steady net-profit margin from 12% – 15% in the last 4 years and will continue in the next 2 years.

The projections are made based on previous historical data, but if the companies in the "Software and IT Services" subsegment receive institutional support especially for training and education of high qualified staff, the growth will be even more significant.

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.A4 SOFTWARE AND IT SERVICES SECTOR OVERVIEW

TABLE B.14
SOFTWARE AND IT SERVICES DETAILED SECTOR OVERVIEW

Software and IT Services - Employees	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	3,038	3,863	4,453	5,286	6,035	6,785
Other IT and computer service activities	1,144	1,360	1,526	1,629	1,791	1,952
Computer consultancy activities	543	629	699	853	956	1,060
Data processing, hosting and related activities	190	298	438	641	791	942
Computer facilities management activities	97	107	111	44		
Publishing of computer games	0	0	0	23		
Other software publishing	0	0	0	3		
Total	4,915	6,150	7,116	8,409	9,574	10,738

Software and IT Services - Average Revenue Per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	23,942	26,446	27,822	28,366	29,109	29,506
Other IT and computer service activities	46,590	43,372	39,789	39,866	38,434	36,931
Computer consultancy activities	26,598	27,545	30,382	32,830	34,009	35,474
Data processing, hosting and related activities	31,112	39,538	43,284	38,559	39,155	39,701
Computer facilities management activities	57,481	39,748	39,643	107,417		
Publishing of computer games	/	/	/	13,531		
Other software publishing	/	/	/	116,352		

Software and IT Services – Average Expanse per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	20,544	22,021	24,756	24,707	25,406	25,954
Other IT and computer service activities	44,136	39,691	37,196	36,325	34,662	33,172
Computer consultancy activities	25,672	23,181	25,053	28,087	28,545	29,761
Data processing, hosting and related activities	25,698	21,627	21,674	18,314	17,723	17,576
Computer facilities management activities	53,020	37,018	37,378	101,342		
Publishing of computer games	/	/	/	26,206		
Other software publishing	/	/	/	107,683		

Software and IT Services - Average Profit Per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Computer programming activities	3,688	3,164	3,438	3,766	3,779	3,882
Other IT and computer service activities	2,845	3,718	2,844	3,571	3,725	3,692
Computer consultancy activities	2,613	3,471	5,147	4,635	5,018	5,351
Data processing, hosting and related activities	7,695	16,445	21,190	18,682	19,561	20,183
Computer facilities management activities	4,076	2,469	2,297	4,944		
Publishing of computer games	/	/	/	525		
Other software publishing	/	/	/	7,766		

Note: All values are in euro except number of employees and relative numbers;
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

From employee standpoint, their total number in the "Software and IT Services" sub-segment is 8,409 in 2019 and is expected to grow up to 10,738 in 2021. "Computer Programming Activities" sector is employing the most with 5,286 or 62% of total workforce in this sub-segment. Still, the most significant growth in the number of employees is achieved by the companies in "Data processing, hosting..." which had 190 employees in 2016 but by 2019 they had 641 or nearly 200% growth in 4 years period, and its expected to grow to nearly 950 in 2021. Again, its very important to emphasize that part of the employees are working in companies which are offering several services, but the company is classified by the one which is creating the larger income share.

For better insight of how companies are performing, considering the growth of employees, the average values for expenses and revenues will give an insight of how the "Software and IT Services"' companies are handling the growth per employee. With exception of "Other IT and Computer Services", all other segments have growth in average revenue per employee, and it's expected the growth to continue in the next 2 years. There is also a trend, where the difference in average revenues between the sectors is reducing on +/-5%, with exception of "Computer programming...", meaning (subjectively) that the companies are offering several different standardized services. The average revenue for all sectors is between 28,366 – 38,866 euros, which considering that the companies are not capital intensive, is highly positive. Average expenses per employee in two segments "Data processing, hosting and related activities" and "Computer facilities management activities" has decreased for more than 20%, but for "Computer programming.." is increasing mainly due the increase of the average salary and large number of employees.

The most interesting sector is "Data processing..." where several trends can be observed. First the growth of average revenue is high, but even more significant is the decrease of the average costs per employee, thus the profit is rising. From subjective (researcher) point of view, that performance is result of several factors as optimization and automatization of the processes while decreasing the impact of the employee related costs (including salaries). There is potential that this kind of trend in the next few years can be observed also in other "Software and IT Services" sectors.

The net-profit per employee for part of the sectors especially for the main one "Computer programming" is stagnant, mostly because the number of employees (and economically active companies) is increasing parallelly with the profit itself, so every additional employee is producing the same revenue and expense thus the same profit.

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.B1 ICT TRADE AND MANUFACTURING SUB-SEGMENT GENERAL PERFORMANCE

The second subsegment is consists of the companies which are doing business in IT Trade and IT Manufacturing. It is more capital intensive because investments in equipment, inventory, and other assets are needed, compared to "Software and IT Services" where the assets are mainly the employees. In 2019 there were 551 economically active companies (income above 1 euro) up from 438 in 2016, with general growth of 26% and average growth of 8% between 2016 and 2019. Nearly all financial indicators are suggesting that the companies in the current subsegment are lacking behind the ones in "Software and IT Services", because the revenue is decreasing, the operating margin is not high also as the net-profit, and fluctuation in the workforce where there is no visible and directed trend.

The revenues have decreased by 8% or on average 2% per year from 247 million in 2016 to 227 million in 2019. The decrease of revenue, while holding the positive financial outcome (net-profit) and operating margin, and a slight increase in the number of employees is pointing out that the companies are doing something right, or they are adjusting to the situation. The net profit per employee has a low oscillation of +/-5% in the last 4 years between 5,083 and 5,496 suggesting that companies are holding on to their profit, no matter the other oscillation in other financial indicators.

The financials are suggesting that employees and their wages are the ones amortizing part of the consequences of the decreased revenues. Total employee-related expenses are steady from 2016 to 2018 with an average of 24 million euros per year, and decreasing to 20 million in 2019, while the number of employees is increasing. The Average Employee Related Expenses per Employee have decreased from 9,264 euro to 7,218 euro or 22% comparing 2019 to 2016. Still the "Average Expenses per Employee" have decreased from 88,010 euro to 76,055 euro, which is suggesting that the companies in this sub-segment are cutting costs and optimizing their activities. The average share of employee-related costs is bellow 10%, which compared to "Software and IT Services" where is 55% and is proving the fact that the employees are the biggest asset for the software companies.

Note: the indicators for 2019 are more complex to analyze because one of the largest retailers in North Macedonia closed its stores, and the other one changed the primary income code, thus they are not included in the analysis. Thus, for this sub-sector, the employee-related indicators are more relevant to observe and analyze.

TABLE B.15
ICT MANUFACTURING & TRADE SUB-SEGMENT GENERAL PERFORMANCE

Criteria	2016 Y.	2017 Y.	2018 Y.	2019 Y.	General Growth (2019/16)	Aver. Growth (17 - 19)
Number of Active Companies	438.00	497.00	507.00	551.00	26%	8%
Revenue (in million)	247.35	249.50	264.39	227.44	-8%	-2%
Expenses (in million)	234.46	229.51	247.78	212.19	-9%	-3%
Operating Income (in million)	12.89	19.99	16.61	15.24	18%	10%
Operating Margin	5%	8%	6%	7%	29%	13%
Net-Profit (in million)	14.64	14.41	15.98	14.71	0%	0%
Financial Loss (in million)	3.32	1.19	0.96	1.08	-67%	-24%
Net-Profit Margin	6%	6%	6%	6%	9%	3%
Number of employees	2,664	2,835	3,032	2,790	5%	2%
EMPLOYEE RELATED INDICATORIS						
Employee Related Expenses (in million)	24.7	24.1	23.8	20.1	-18%	-6%
Employee Related Expenses Per Employee	9,264	8,501	7,861	7,218	-22%	-8%
Average Income Per Employee	92,849	88,008	87,200	81,519	-12%	-4%
Average Expense Per Employee	88,010	80,957	81,721	76,055	-14%	-5%
Average Net-Profit Per Employee	5,496	5,083	5,270	5,274	-4%	-1%

Note: All values are in euro
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

ICT – TRADE & MANUFACTURING SECTORS (NACE Classification)

46.51 Wholesale of computers, computer peripheral equipment and software; 46.52 Wholesale of electronic and telecommunications equipment and parts; 46.41 Retail sale of computers, peripheral equipment and software in specialized stores; 47.42 Retail sale of telecommunications equipment in specialized stores; 26.20 Manufacture of computers and computer peripheral equipment; 26.30 Manufacture of communication equipment;

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.B2 ICT TRADE AND MANUFACTURING SUB-SEGMENT FUTURE PERFORMANCE

TABLE B.16
GENERAL IT MANUFACTURING & TRADE SUB-SEGMENT PERFORMANCE

IT Manufacturing & Trade	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Number of Active Companies	438.00	497.00	507.00	551.00	596.08	634.87
Revenue (in million euro)	247.35	249.50	264.39	227.44	220.80	211.24
Expenses (in million euro)	234.46	229.51	247.78	212.19	204.77	196.53
Operating Income (in million euro)	12.89	19.99	16.61	15.24	16.03	14.71
Operating Margin	5.21%	8.01%	6.28%	6.70%	7.26%	6.96%
Net-Profit	14.64	14.41	15.98	14.71	14.74	14.85
Financial Loss	3.32	1.19	0.96	1.08	0.34	0.06
Net-Profit Margin	5.92%	5.78%	6.04%	6.47%	6.67%	7.03%
Number of employees	2,664	2,835	3,032	2,790	2,832	2,831
EMPLOYEE RELATED INDICATORS						
Employee Related Expenses	24.7	24.1	23.8	20.1	18.6	16.8
Employee Related Expenses Per Employee	9,264	8,500	7,860	7,218	6,576	5,934
Average Income Per Employee	92,848	88,008	87,199	81,519	77,966	74,615
Average Expense Per Employee	88,009	80,956	81,721	76,055	72,307	69,419
Average Net-Profit Per Employee	5,496	5,082	5,269	5,273	5,204	5,244

Note: All values are in euro
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

ICT – TRADE & MANUFACTURING SECTORS (NACE Classification)

46.51 Wholesale of computers, computer peripheral equipment and software; 46.52 Wholesale of electronic and telecommunications equipment and parts; 46.41 Retail sale of computers, peripheral equipment and software in specialized stores; 47.42 Retail sale of telecommunications equipment in specialized stores; 26.20 Manufacture of computers and computer peripheral equipment; 26.30 Manufacture of communication equipment;

The uncertainty for the future is very high by the time when this report has been created, which is caused by the crisis of the virus "COVID-19". If just half-year back (end of 2019) the brick-and-mortar retail was solid on the North Macedonia market, today (June 2020) it is experiencing a huge setback. Online sales is growing very fast, the large retailers today are struggling in delivering their value (products) using the digital channels. Also, the main strategy (thus the main revenue) of the companies was the development of traditional channels while the digital ones were mainly optional. This is directly affecting the wholesalers, which are highly dependent on retail networks. Even if the researchers have created a projection until 2021, it is very important to take it with reserve.

By the end of 2019, there were 551 economically active companies (with revenue above 1 euro) and if the growth continues it will reach 634 until the end of 2021. From the indicators that are most likely to occur, the first one is that the companies will continue to "nurse" the net-profit margin which is projected to be between 6-7% in the next 2 years, as well as the average Net-Profit Per Employee to hold on nearly 5,200 euro. The average number of employees would be steady 2,830 until 2021, again below its peak in 2018 of 3,032. The Operating Margin will also be the same level as before, between 7.00% – 7,50%. It is certain that part of the companies will shift on the digital channels, so there is potential because they are flexible and they have different cost structure (not paying rents, employees, or sustaining large retail network) than brick-and-mortar stores to have for several percent higher profit and operating margin.

On the other side, the average income per employee will decrease to nearly 74,500 euros in 2021, as the average expense to 69,400 euros. The employee-related expenses are projected to decrease at the same pace as before (average 700 euro per year) to the level of 6,000 euros per employee per year, which is roughly about 340-euro net-salary or maybe it would stabilize on the current level. The total expenses are estimated to be between 196 and 204 million euros, thus there is potential if the previous calculation is considered as relevant, that the employee-related costs are 9% of total costs, the salaries to be higher than projected above for 100 euro.

Again the projections for this sub-segment should be taken into account with caution because there are unpredictable external factors which have a huge impact on the work of the companies as previously mentioned COVID-19 crisis and the classification code changes of the companies.

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.B3 ICT TRADE AND MANUFACTURING SUB-SEGMENT FUTURE PERFORMANCE

TABLE B.17
IT TRADE & MANUFACTURING DETAILED OVERVIEW

ICT Manufacturing & Trade – Revenue	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	115.82	108.12	115.69	116.24	116.39	119.14
Wholesale of electronic and telecommunications...	48.22	44.76	42.78	57.14	60.12	65.24
Retail sale of computers...	57.71	65.52	77.61	24.82		
Retail sale of telecommunications...	12.52	19.31	14.43	14.98	15.80	14.62
Manufacture of computers ...	13.07	11.79	13.88	13.22	13.27	13.76
Manufacture of communication equipment	0.00	0.00	0.00	1.03	1.37	1.83

ICT Manufacturing & Trade – Expenses	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	107.78	99.40	106.90	107.97	108.03	110.91
Wholesale of electronic and telecommunications...	46.51	41.45	38.68	52.77	54.85	59.32
Retail sale of computers...	56.26	63.52	75.09	23.73		
Retail sale of telecommunications...	12.07	14.22	14.12	14.82	15.74	16.24
Manufacture of computers ...	11.83	10.93	13.00	11.93	11.97	12.31
Manufacture of communication equipment	0.00	0.00	0.00	0.97	1.29	1.73
Total	234.46	229.51	247.78	212.19	204.77	202.56

ICT Manufacturing & Trade – Profit	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	8.06	8.14	8.26	7.60	7.45	7.21
Wholesale of electronic and telecommunications...	3.16	3.03	3.99	4.31	4.70	5.25
Retail sale of computers...	1.77	2.15	2.58	1.25		
Retail sale of telecommunications...	0.49	0.31	0.38	0.28	0.20	0.17
Manufacture of computers ...	1.16	0.78	0.77	1.21	1.23	1.38
Manufacture of communication equipment	0.00	0.00	0.00	0.06	0.08	0.11
Total	14.64	14.41	15.98	14.71	14.74	14.85

ICT Manufacturing & Trade - Profit Margin	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	7.48%	8.19%	7.73%	7.04%	6.89%	6.51%
Wholesale of electronic and telecommunications...	6.80%	7.31%	10.31%	8.17%	8.56%	8.85%
Retail sale of computers...	3.14%	3.39%	3.44%	5.28%		
Retail sale of telecommunications...	4.05%	2.19%	2.67%	1.86%	1.30%	1.04%
Manufacture of computers ...	9.82%	7.12%	5.91%	10.15%	10.26%	11.19%
Manufacture of communication equipment	/	/	/	6.52%	6.52%	6.52%

Note: All values are in euro except number of employees and relative numbers;
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

From the detailed overview of the sub-segment several trends could be observed. First and foremost, as previously mentioned, the significant decline in the "Retail sale of computers" is caused by the closing of one of the largest retailers in North Macedonia in 2019 and change of the primary activity code of another pushing the segment to drop sharply nearly 40 million euro per year. When analyzing the financials of the segment for retail of IT and communication equipment it is very difficult to cut the share of the revenue that is from the IT equipment, because most often the retail companies are selling home appliances and other electronic devices together with the IT equipment. Also, part of the companies are changing their classification based on the share of different types of products/services in the revenue. For example, if in one-year sales, the Home Appliances sector is dominant, the company will have one classification code, but if the next IT Equipment overtakes the share, the same company will have completed another classification code, thus one year can be included in the ICT Industry and another one not.

Most of the "IT Trade & Manufacturing" sectors are stagnating or highly unstable (no visible trend) in revenue, expenses, profit, profit margin except "Wholesale of electronic and telecommunication" where those financial indicators are slightly growing. The largest sector by revenue is "Wholesale of computers..." with projected 119 million euros in 2021. The second one by revenue is the only steady growing "Wholesale of electronic and telecommunication" reaching 65 million in 2021. It can be expected, if a new retailer appears on the place of the previous one, the sector of "Retail sale of computers.." to reach again higher revenues and expenses thus reaching the level from 2016 – 2018 again.

The Profit and Net-Profit Margin are not significant for most of the sectors except in "Manufacture of computers" where in 2019 it is reaching positive 10.15%. Even the Net-Income is positive, its not significant to allow the companies significant growth or improving the employee's wages. The lowest Net-Margin is in the "Retails Sale of Telecommunications equipment..." reaching fragile 1.86% in 2019, but even the trend suggests that it will fall on 1.04% by 2021, the probability for doing business with 1% net profit margin is low so the companies within this segment will try to raise their profits.

There is an objective difference analyzing both IT sub-segments "Software and IT Services" and "IT Trade & Manufacturing", because the companies which are working software and IT services are more profitable and employee-oriented than the ones in the current sub-segment.

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.B4 ICT TRADE AND MANUFACTURING SECTOR OVERVIEW

TABLE B.18
IT TRADE & MANUFACTURING DETAILED OVERVIEW

ICT Manufacturing & Trade – Employees	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	702	737	829	931	1,007	1,097
Wholesale of electronic and telecommunications...	512	522	550	651	697	755
Retail sale of computers...	837	915	1,007	514		
Retail sale of telecommunications...	400	451	434	474	498	514
Manufacture of computers ...	216	213	214	203	198	193
Manufacture of communication equipment	0	0	0	18	24	32
Total	2,667	2,838	3,034	2,791	2,832	2,830

ICT Manufacturing & Trade - Average Revenue Per Employee	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	164,983	146,704	139,559	124,860	115,539	108,563
Wholesale of electronic and telecommunications...	94,177	85,753	77,779	87,780	86,215	86,321
Retail sale of computers...	68,952	71,608	77,072	48,295		
Retail sale of telecommunications...	31,312	42,810	33,238	31,599	31,675	28,422
Manufacture of computers ...	60,531	55,358	64,863	65,114	66,775	70,956
Manufacture of communication equipment	/	/	/	57,207	57,207	57,207

ICT Manufacturing & Trade - Average Expense Per Employee	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	153,537	134,872	128,951	115,972	107,245	101,061
Wholesale of electronic and telecommunications...	90,847	79,401	70,322	81,058	78,663	78,493
Retail sale of computers...	67,215	69,417	74,565	46,173		
Retail sale of telecommunications...	30,175	31,522	32,526	31,265	31,556	31,566
Manufacture of computers ...	54,777	51,317	60,738	58,780	60,231	63,495
Manufacture of communication equipment	/	/	/	53,947	53,947	53,947

ICT Manufacturing & Trade - Average Net-Profit Per Employee	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Wholesale of computers..	11,485	11,042	9,965	8,163	7,391	6,574
Wholesale of electronic and telecommunications...	6,174	5,803	7,251	6,623	6,733	6,947
Retail sale of computers...	2,113	2,354	2,566	2,436	2,658	3,050
Retail sale of telecommunications...	1,222	689	868	581	410	329
Manufacture of computers ...	5,378	3,654	3,589	5,968	6,182	7,108
Manufacture of communication equipment	/	/	/	3,515	3,515	3,515

Note: All values are in euro except number of employees and relative numbers;
Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

By 2019, the largest sector by the number of employees in the "IT Trade & Manufacturing" sub-segment is "Wholesale of computers" with 931 and is the one with the largest growth reaching 1,097 employees until the end of 2021. Still, "Retail sale of computers.." should be the largest sector and by 2018 was the one, but the shift of the one and closure of other retailers in 2019 caused a change, that why the projections are excluded from the tables for 2020 and 2021. Also, the crisis caused by the virus "COVID-19" will produce additional uncertainty which is hard to incorporate within the calculations especially for 2020. There are sectors where only a few companies are active from 2019 as "Manufacture of communication equipment" where only 24 individuals are employed.

There is a significant difference in the Average Revenue per Employee in the sectors, but the indicator is decreasing or is stagnant for nearly all of them except "Manufacture of computers" where there is growth and from the projection will reach nearly 71,000 euro till the end of 2021. The highest Average Revenue per Employee is in "Wholesale of computers.." with 124,960 euros per employee (down from 164,983 in 2016) and by 2021 to decrease under 110,000 euros. The lowest is in "Retail sale of telecommunication" with 31,599 euros in 2019, and they will probably fall to little bellow 28,500.

On another side, the Average Expense per Employee is also decreasing for most of the sectors, except again for "Manufacture of Computers and computer peripheral equipment" where the average is expected to reach 101,000 euro till 2021, also "Wholesale of electronic and telecommunication..." has high Average Expense per Employee which is projected to be 78,500 euro again in 2021.

The indicator that is continuous and stable which is highly positive for most of the sectors is Average Net-Profit per Employee, but for "Wholesale of Computers...." has decreased by nearly 30% in the past 4 years and if the trend continues it will reach 6,500 euro. The lowest Average Net-Profit per Employee is in "Retail Sale of Telecommunication Equipment" which has reached 581 euros and its highly possible to maintain the same level or even fall lower. Other sectors, although are having a low net-profit margin (analyzed in the previous slide) is stable and continuous.

Unlike the previously analyzed sub-segment "Software and IT Services" which is (for now and unofficially) slightly affected by the current COVID-19 crises, the current one "IT Trade & Manufacturing" will be heavily damaged by it. Until there is official data at disposal the analysis of the current historical data and creating trends is the only viable option.

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.C1 **OTHER IT** SUB-SEGMENT GENERAL PERFORMANCE

The last IT Subsegment consists of companies in "63.12 Web portals" and "95.11 Repair of computers and peripheral equipment". The analysis will be only in general because there are very few companies. Still, their growth of 339% is significant in the past 4 years from 41 in 2016 to 180 by 2019. The average yearly growth is 72% in the same period, which is directly suggesting that it will continue in the next period, reaching potentially 484 companies by 2021, and from small subsegment, it will grow in a serious employer.

The revenue of 10.6 million euros in 2019 for subsegment with a small number of companies and the number of employees is significant up from 3.90 million euros in 2016. If the trend continues it will continue to grow up to 15 million by 2021. Also, there is another positive variable that cannot be calculated currently, and it is related to the growth of the currently active companies, meaning that part of them will have even more employees in future, thus enlarging the revenue and profit. The expense on the other side the expenses are growing from 3,77 million to 9.65 million euros from 2016 to 2021.

The operating income and operating margin are inconsistent throughout the period and it is not allowing to create the future projection. The Operating Margin peak is in 2017 with 29.48% but decreases as low as 3.38% in 2016, which is expected considering the low number of companies within the segment. In absolute numbers, the Operating Income is ranging 0.13 million (2016) to 1.88 million euro (2017) but in all analyzed years is positive.

The Net-Profit is growing from 0.27 million in 2016 to 1.05 million euros in 2019 which is positive, reaching nearly 10% Net-Profit Margin. From the calculations, there are also companies that had a financial loss each year, but on the positive side is that the loss is stagnant and on the same level for the 4 analyzed years ranging from 0.15 to 0.18 million euros. Because the values of the basic indicators have high fluctuation, the indicators per employee are maybe overestimated or underestimated, but several trends can be observed. The number of employees is growing continuously from 248 in 2016 to 516 in 2019 and it is very clear that even the number of active companies has grown for 339% the number of employees "only" 108% in the same period.

Subjective view: The average income per employee has increased from 15,716 euro to 20,556 euro which analyzed as an absolute value is highly positive, but considering that most of the companies are micro (on average 3 employees), the salary of the owner/manager is rising the general average, thus this numbers should be analyzed with caution.

TABLE B.19
OTHER IT SERIVICES SUBSEGMENT GENERAL PERFORMANCE

Other IT Services	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Number of Active Companies	41	90	93	180	310	484
Revenue (in million euro)	3.90	6.37	6.24	10.61	12.84	15.00
Expenses (in million euro)	3.77	4.49	5.48	9.65		
Operating Income (in million euro)	0.13	1.88	0.76	0.96		
Operating Margin	3.38%	29.48%	12.21%	9.03%		
Net-Profit	0.27	0.55	0.82	1.05	1.31	1.57
Financial Loss	0.18	0.15	0.15	0.19	0.20	0.22
Net-Profit Margin	6.98%	8.57%	13.11%	9.91%	10.20%	10.43%
Number of employees	248	322	356	516	605	699
EMPLOYEE RELATED INDICATORS						
Employee Related Expenses	3.33	3.69	3.37	3.86	4.03	4.14
Employee Related Expenses Per Employee	13,446	11,456	9,465	7,474	6,659	5,923
Average Income Per Employee	15,716	19,768	17,525	20,556	21,217	21,439
Average Expense Per Employee	15,184	13,942	15,385	18,699		
Average Net-Profit Per Employee	1,097	1,693	2,298	2,036	2,164	2,237

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

Note: Because the growth rates are inconsistent, the future projections will be shown only for the indicators which are relevant and allowing high-quality conclusion.

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.D1 **TELECOMMUNICATION** SUB-SEGMENT GENERAL PERFORMANCE

The "Telecommunication" currently is largest by generated revenue and expenses, and second by the number of employees behind "Software and IT Services". It's expected the number of companies to be lower compared to other segments, wherein 2016 there were 104 economically active companies growing up to 123 by 2019 with total growth of 18% or 19 companies. When financially analyzing this segment, it should be emphasized that this type of company have huge expenses for deploying and maintaining the equipment for telecommunication ether they are working in wireless, wired, or satellite communication. Also, the entry barriers for new companies (competitors) are high, because the initial investment, requires a highly trained workforce, distribution network, etc., which does this business of high profile with huge costs for implementation and maintenance. Even the number of companies is small, the total revenue is significant reaching 368 million euros in 2019 up from 348 million in 2016 with 6% total growth and 2% average yearly growth in the same period. The average revenue per company is 3 million euros, again significant given the fact from the previous subsegment "Other IT" where 180 companies were having a total of 10 million euros. On the side of expenses, they reach 336.59 million in 2016 and are decreasing on 319 by 2019. The decrease is potentially caused by the optimization of the processes within the companies other than employees because the revenue is growing and the number of employees is nearly stagnant together with the employee-related expenses in the same period.

The operating income has increased from 11.78 million to 49.03 million between 2016 to 2019 with an average growth rate of 72% which is highly positive. The operating margin is ranging between 3% and 13%, which means that the companies are having a fair margin from their primary activities. The Net-profit is growing from 26 million in 2016 to 46 million in 2019 growing 74% or an average of 21% per year. In 2016th there is a significant financial loss of 18 million, but afterward is falling on 5 million and in the last 2 years stabilizing on 3 million each. In the "Telecommunication" segment the number of employees has grown from 3,024 to 3,271 in 2019 but the growth from 2017 onwards is stagnant with +/-100 employees and on average, one company has 26 employees by 2019. The Employee Related Expenses are also stagnant with one peak in 2017 with 43 million euros, but from the data, they are between 40 – 41 million.

From the last employee-related indicators, the average Employee related expenses per employee are also nearly the same in the range of +/-5,000 euros from 104,056 to 115,204 euros. The Net-Profit Per Employee has grown from 8,751 euros to 14,092 euros with total growth between 2016 to 2019 of 61% and average growth of 19% per year.

TABLE B.20
TELECOMMUNICATION SEGMENT GENERAL PERFORMANCE

INDICATOR	2016 Y.	2017 Y.	2018 Y.	2019 Y.	General Growth (2019/16)	Aver. Growth (17 - 19)
Number of Active Companies	104	113	115	123	18%	6%
Revenue (in million euro)	348.38	352.65	351.14	368.61	6%	2%
Average Revenue per company (in million euro)	3.35	3.12	3.05	3.00	-11%	-4%
Expenses (in million euro)	336.59	321.97	304.96	319.58	-5%	-2%
Operating Income (in million euro)	11.78	30.68	46.18	49.03	316%	72%
Operating Margin	3%	9%	13%	13%	293%	70%
Net-Profit	26.46	30.61	43.68	46.10	74%	21%
Financial Loss	18.96	5.57	3.05	3.08	-84%	-38%
Net-Profit Margin	8%	9%	12%	13%	65%	19%
Number of employees	3,024	3,389	3,207	3,271	8%	3%
Average Number of Employees per Company	29.08	29.99	27.89	26.59	-9%	-3%
EMPLOYEE RELATED INDICATORS						
Employee Related Expenses	39.19	43.47	40.75	41.09	5%	2%
Employee Related Expenses Per Employee	12,960	12,826	12,707	12,562	-3%	-1%
Average Income Per Employee	115,204	104,056	109,490	112,690	-2%	-1%
Average Expense Per Employee	111,307	95,004	95,091	97,701	-12%	-4%
Average Net-Profit Per Employee	8,751	9,032	13,620	14,092	61%	19%

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.D1 **TELECOMMUNICATION** SUB-SEGMENT FUTURE PERFORMANCE

TABLE B.21
TELECOMMUNICATION SEGMENT GENERAL PERFORMANCE

GENERAL INDICATORS	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Number of Active Companies	104	113	115	123	129	135
Revenue (in million euro)	348.38	352.65	351.14	368.61	375.35	382.92
Average Revenue per company (in million euro)	3.35	3.12	3.05	3.00	2.90	2.84
Expenses (in million euro)	336.59	321.97	304.96	319.58	313.91	311.23
Operating Income (in million euro)	11.78	30.68	46.18	49.03	61.44	71.70
Operating Margin	3.38%	8.70%	13.15%	13.30%	16.37%	18.72%
Net-Profit	26.46	30.61	43.68	46.10	52.64	59.98
Financial Loss	18.96	5.57	3.05	3.08	2.25	1.14
Net-Profit Margin	7.60%	8.68%	12.44%	12.51%	14.02%	15.66%
Number of employees	3,024	3,389	3,207	3,271	3,353	3,341
EMPLOYEE RELATED INDICATORS						
Average Number of Employees per Company	29	30	28	27	26	25
Employee Related Expenses	39.2	43.5	40.8	41.1	41.7	41.1
Employee Related Expenses Per Employee	12,961	12,827	12,707	12,563	12,443	12,314
Average Income Per Employee	115,204	104,056	109,490	112,690	111,935	114,598
Average Expense Per Employee	111,307	95,004	95,091	97,702	93,612	93,141
Average Net-Profit Per Employee	8,752	9,032	13,621	14,092	15,698	17,951

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

The growth in this segment will continue in the next two years and the number of economically active companies will reach 135 by 2021 up from 123 in 2019, which again its not significant, but their financial results are significant compared to all other analyzed segments. The current crisis caused by COVID-19, with high probability, will not affect the financial performance of the "Telecommunication" segment so the projected values for 2020 are valid.

According to the previous period growth rates of the "Telecommunication" segment, the revenue will reach 382 million euros by 2021 and average revenue per company will decrease to 2.84 million euros in the same year down from 3.00 in 2019. This revenue, with high probability, will ensure the first position on this segment by revenue until 2021, after which "Software and IT Services" will take the lead. On the expenses side, they will stay nearly on the same level as until 2019 or 311.23 million in 2021 a little lower than 319.58. Still, there is potential for an increase in the expenses, because in the next few years part of the companies will have to implement a 5G network on the territory of North Macedonia, therefore they will need to invest a significant amount of cash.

The operating income, considering the previous trend, will continue with the growth reaching 71 million by 2021 up from 49 million euros in 2019. The average operating margin will grow to nearly 19% in the same period. Considering that 20% operating margin is too high, there is a high probability that the margin and operating income will stay on the level projected in 2020 or on average 16%. The Net-Income is also projected to grow to 60 million euros by 2021, but the previously mentioned investment in the 5G network could lower the net profit depending on the method of financing.

The average number of employees will stay nearly the same averaging nearly 3,340 employees in the next 2 years. Also, the Average Employee Related Expenses will stay the same as Average Employee Related Expenses. The only employee-related indicator which could possibly decrease is the Average Expense Per Employee down to 93,141 euros in 2021. If the Net-Profit reaches the projected level of 60 million in 2021, the average net-profit per employee will increase significantly to 17,951 mainly because the number of employees will stay the same while the net profit is increasing.

In general, the "Telecommunication" segment will keep its high performance in the next few years reaching new levels of revenue and high net-profit. From the projected values this segment will stay on the top analyzed by revenue compared to all other in the ICT.

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.D1 **TELECOMMUNICATION** SECTOR OVERVIEW

It should be noted that nearly every company in the "Telecommunication" segment is offering all services which are shown as subsegment. For example, if one company is offering wireless telecommunication it is also offering wired or satellite telecommunication, thus it is very difficult to conclude exactly how much of the income is coming from various sources analyzing the general company financial data.

In each analyzed indicator the subsegment "Wireless telecommunication activities" is by far the largest one. This subsegment has a total of 312 million up from 304 million and It will grow to 320 million euros by 2021. Analyzing the revenue, it is showing that the growth of the segment is produced by all subsegments, except "Satellite telecommunication activities". Even the far smaller segment of "Wired telecommunication activities" has a growth of 4 million euros and is responsible for a fair share of the total growth. Nearly all subsegments, again except satellite telecommunication, will continue with the growth in the next 2 years reaching a total of 382.92 million euros by 2021.

On the side of expenses, there is a significant difference between the subsegment. The largest "Wireless telecommunication activities" has a significant cut of expenses from 299 million euros in 2016 down to 267 million by 2019 or nearly 8 million per year, and the same subsegment is responsible for lowering the expense of the whole segment. All others have growth in expenses, especially "Other telecommunication activities" with nearly 30%.

The profit has increased from 26 million to 46 million from 2016 to 2019, but its mainly caused by the growth of the profit in the biggest sector. All others have stagnant or low-profit growth. From the Profit-Margin perspective, in 2019, 3 of 4 subsegments have two-digit or above 10% which is highly positive. The "Wired telecommunication activities" subsegment in 2016 has even a 22% net profit margin which is very high. The only "fragile" segment as expected is "Satellite telecommunication activities" because barely profitable. Until 2021, all projections are positive with an average margin for 3 segments above 10%. Still "Wired telecommunication activities" subsegment has a significant drop of the Net-profit margin from 22.09% in 2016 to the projected 10.80% margin in 2021.

The very interesting situation could be observed in the "Satellite telecommunication activities" subsegment, where even the expenses are higher than the revenue, they are accounting for profit in each year, or one company is accounting it (5 companies are economically active within the subsegment).

TABLE B.22
TELECOMMUNICATION DETAILED OVERVIEW

Telecommunication - Revenue	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	17.22	18.71	19.38	21.33	22.70	24.03
Wireless telecommunications activities	304.93	297.46	306.33	312.50	315.02	320.88
Satellite telecommunications activities	2.66	2.42	2.19	2.33	2.22	2.15
Other telecommunications activities	23.56	34.05	23.24	32.45	35.42	35.87
Total	348.38	352.65	351.14	368.61	375.35	382.92
Telecommunication - Expenses	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	13.86	15.85	16.56	18.62	20.21	21.67
Wireless telecommunications activities	298.14	270.35	263.28	267.99	257.93	253.80
Satellite telecommunications activities	2.76	2.87	2.77	3.56	3.83	4.10
Other telecommunications activities	21.83	32.90	22.34	29.41	31.93	31.61
Total	336.59	321.97	304.96	319.58	313.91	311.17
Telecommunication - Profit	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	3.06	2.73	3.09	2.59	2.44	2.34
Wireless telecommunications activities	21.67	26.94	39.50	40.33	46.55	53.08
Satellite telecommunications activities	0.02	0.03	0.01	0.01	0.01	0.00
Other telecommunications activities	1.72	0.91	1.08	3.16	3.64	4.55
Total	26.46	30.61	43.68	46.10	52.64	59.98
Telecommunication - Profit Margin	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	22.09%	17.24%	18.66%	13.93%	12.07%	10.80%
Wireless telecommunications activities	7.27%	9.96%	15.00%	15.05%	18.05%	20.92%
Satellite telecommunications activities	0.75%	1.13%	0.18%	0.39%	0.31%	0.12%
Other telecommunications activities	7.86%	2.75%	4.84%	10.74%	11.40%	14.40%

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

BX. ICT INDUSTRY – DETAILED PERFORMANCE
BX.D1 TELECOMMUNICATION SECTOR OVERVIEW

TABLE B.23
TELECOMMUNICATION DETAILED OVERVIEW

Telecommunication - Employees	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	384	463	477	500	538	563
Wireless telecommunications activities	2,293	2,231	2,156	2,049	1,967	1,879
Satellite telecommunications activities	16	17	19	16	16	15
Other telecommunications activities	355	708	590	742	871	925
Total	3,048	3,419	3,242	3,307	3,393	3,385
Telecommunication - Average Revenue Per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	44,855	40,406	40,620	42,658	42,136	42,610
Wireless telecommunications activities	132,984	133,332	142,082	152,514	160,100	170,690
Other telecommunications activities	66,357	48,100	39,388	43,736	40,663	38,766
Telecommunication - Average Expense Per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	36,090	34,227	34,725	37,248	37,524	38,426
Wireless telecommunications activities	130,022	121,179	122,117	130,788	131,086	135,005
Other telecommunications activities	61,500	46,466	37,864	39,634	36,663	34,163
IT Manufacturing & Trade - Average Net-Profit Per Employee	**2016 Y.**	**2017 Y.**	**2018 Y.**	**2019 Y.**	**2020 Y. (est.)**	**2021 Y. (est.)**
Wired telecommunications activities	7,972	5,901	6,478	5,189	4,528	4,152
Wireless telecommunications activities	9,449	12,075	18,323	19,682	23,656	28,238
Other telecommunications activities	4,832	1,278	1,834	4,258	4,180	4,920

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

The last indicators for the "Telecommunication" segment are the employee-related ones. The largest segment by the number of employees is again "Wireless telecommunication activities" but the number is declining from 2,293 to 2,049 and with high probability will continue so to 1,879 until 2021. It's interesting that even the other segments have significantly lower revenue, they have a fair share of the total number of employees within the segment.

Previous conclusion about the number of employees and the revenue also can be observed in the indicator Average Revenue per Employee. There is a huge difference between "Wireless telecommunication activities" and the other segments or 152,514 euro compared to 42/43.000 euro in the other segments. The difference between the largest and the other two segments will deepen even more. The average revenue per employee will continue to grow for the main segment, but for the other two will stagnate or even reduce. "Satellite telecommunication activities" will be excluded due, a low number of employees and economically active companies.

Analyzing from point of view of an expense, there is a slightly different situation than the revenue. The expenses for the main segment "Wireless telecommunication" are fluctuating from 2016 to 2018, but they will increase nearly 5,000 euros per employee until 2021. There is a significant drop in the average expenses in "Other telecommunication services" from 61.500 in 2016 to 39,634 by 2019 and an additional drop is projected on 34,163 until 2021.

The average Net-Profit which is calculated for the "Wireless telecommunication services" of 19,682 is the highest among the ICT Industry together with the "Data processing…" subsegment from the "Software and IT Services" segment. Bearing in mind the number of employees (2,049) and there are only 23 companies this net-performance I highly positive. The two other subsegments wired and other communications have net-profit which is not for underestimating reaching 5,000 euros per employee for wired but is it continuously declining and 4,258 for other telecommunication services by 2019.

In general, this "Telecommunication" segment is led by the "Wireless telecommunication services" subsegment because 85% of the revenue and 87% of the profit is produced by it. Also, it employs most of the individuals and has significant results in average revenue, expense, and net profit per employee. As mentioned at the beginning of this detailed financial analysis, most of the companies are offering every telecommunication service (mentioned) but they are classified by the one that has the largest share within the subsegment.

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.E1 LARGEST 100 COMPANIES IN ICT INDUSTRY

by revenue in year 2019 (values in '000 000 million euros)

Position	Company	REVENUE 2019	EXPENSES 2019	PROFIT 2019	EMPLOYEES 2019
1	Македонски Телеком АД	177,413,711	146,662,383	26,999,744	1060
2	ОНЕ.ВИП ДООЕЛ	127,308,289	114,276,728	11,480,678	764
3	СЕАВУС ДООЕЛ Скопје	16,894,837	13,026,575	3,629,283	447
4	СУПОРТ & СОЛУШНС ЦЕНТАР МК ДООЕЛ	15,556,804	3,818,909	10,574,899	189
5	РОБИ ДООЕЛ	13,102,994	11,156,914	1,789,957	221
6	АССЕКО СЕЕ ДООЕЛ	12,824,818	10,352,166	2,176,438	172
7	ПАКОМ КОМПАНИ ДООЕЛ	12,388,183	11,953,169	382,382	35
8	ИНГРАМ МИКРО МАКЕДОНИЈА ДООЕЛ	11,829,995	11,798,173	18,744	15
9	АНХОЧ ДООЕЛ	11,761,394	11,324,891	389,640	104
10	КОМТРЕЈД ДИСТРИБУЦИЈА ДООЕЛ	11,532,250	11,449,491	56,353	20
11	ИТД ДИСТРИБУЦИЈА ДОО	10,617,817	10,477,046	106,748	33
12	АМАКО НЕТ ДООЕЛ увоз-извоз Скопје	10,183,551	9,977,004	186,764	30
13	НЕТЦЕТЕРА ДООЕЛ експорт-импорт Скопје	9,957,950	9,166,456	627,333	235
14	АИТОНИКС АД Скопје	9,443,633	8,847,893	544,640	35
15	ЕНДАВА ДООЕЛ Скопје	9,011,767	8,044,297	845,083	250
16	ЕЛИНГ ДОО Увоз - Извоз,Скопје	8,409,123	7,534,366	813,928	63
17	АГЕНЦИЈА ЗА ЕЛЕКТРОНСКИ КОМУНИКАЦИИ	8,305,054	5,943,019	2,279,147	125
18	ЕРИКСОН ТЕЛЕКОМУНИКАЦИИ МАКЕДОНИЈА ДООЕЛ	7,665,350	7,490,845	107,966	199
19	С и Т МАКЕДОНИЈА ДООЕЛ	7,309,816	6,975,570	273,227	37
20	НЕКСТСЕНС ДОО	6,529,221	5,730,351	733,526	89
21	НЕОТЕЛ ДОО	6,327,557	6,112,368	186,393	70
22	НЕОКОМ АД	5,673,311	5,615,702	50,044	42
23	АЛОКЕЈТ СОФТВЕР ДООЕЛ	5,160,574	4,572,305	514,688	164
24	ИНТЕРВОРКС увоз-извоз ДООЕЛ	4,973,291	2,977,304	1,861,103	149
25	МАКЕДОНСКА РАДИОДИФУЗИЈА-СКОПЈЕ	4,732,468	2,823,815	1,705,460	141
26	АЈ СТАИЛ ДОО	4,490,698	4,420,153	61,568	16
27	ХАЈ КОМУНИКАЦИИ ДОО	4,107,471	3,917,214	177,730	10
28	ПЦ КОНТРОЛ ХАРДВЕР ДООЕЛ	3,822,571	3,584,849	217,059	49
29	ПРОГРАМ ПЛУС Горан ДООЕЛ	3,748,905	3,587,244	139,231	4
30	ИНТЕК СИСТЕМ ДОО	3,681,667	3,479,970	173,772	34
31	ЗТЕ МАКЕДОНИЈА ДООЕЛ	3,552,471	3,202,642	312,924	4
32	МУСАЛА СОФТ ДООЕЛ	3,498,640	3,467,751	20,037	142
33	ИНСКЕЈЛ МАКЕДОНИЈА ДООЕЛ	3,459,336	3,253,624	181,359	100
34	САГА МК ДООЕЛ	3,356,295	3,290,752	46,818	10
35	ТЕЛЕЛИНК МК ДОО	3,316,156	3,282,785	#VALUE!	/
36	ИТГМА ДОО	3,198,425	2,930,420	236,000	61
37	ХЕНДИ ТЕЛЕКОМ ДООЕЛ	3,166,888	3,102,594	57,354	109
38	Х4 СЕРВИЦЕС ДООЕЛ	3,166,796	3,045,158	84,106	66
39	ИНПЛЕЕР ХУБ ДООЕЛ	3,118,875	3,086,487	14,541	109
40	ДУНА ДОО	2,926,112	2,830,330	89,675	52
41	АКСАПТА МАСТЕРС ДОО	2,813,777	2,156,137	588,122	47
42	АКЦЕНТ ДООЕЛ	2,805,332	2,058,055	664,783	63
43	ПАН-ЕВРОПА Л.Т.Д.Зоран ДООЕЛ	2,678,415	2,637,162	33,434	17
44	ИНЕТ ДОО	2,677,571	2,666,382	744	9
45	ИНФО-БИРО Драган и Димитри ДОО	2,474,419	2,248,673	212,686	87
46	ПЕЈТЕН ДООЕЛ	2,410,077	2,101,760	276,509	29
47	ЛЕКС-ЕЛЕКТРИК ДООЕЛ	2,381,041	2,163,283	194,219	20
48	Интернационален Картичен Систем АД Скопје	2,369,563	1,895,033	421,945	36
49	МАТРИКС И.Т.ГЛОБАЛ СЕРВИЦЕС МАКЕДОНИЈА ДООЕЛ	2,347,961	2,188,776	127,032	120
50	ТОТАЛ ТВ ДОО Скопје	2,251,407	3,494,780	0	12

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

BX. ICT INDUSTRY – DETAILED PERFORMANCE

BX.E1 LARGEST 100 COMPANIES IN ICT INDUSTRY

by revenue in year 2019 (values in '000 000 million euros)

Position	Company	REVENUE 2019	EXPENSES 2019	PROFIT 2019	EMPLOYEES 2019
51	УЛТРА ДОО	2,243,501	2,218,017	20,291	45
52	АКСЕЛТРА ДООЕЛ	2,216,976	1,879,206	305,299	88
53	МЕЛОН СОЛУШНС ДООЕЛ	2,123,209	2,017,947	95,503	82
54	ЦИЛИНДО ИНТЕРНАЦИОНАЛ АпС (ДОО)	2,120,889	2,094,677	15,735	74
55	КАБТЕЛ ДООЕЛ	2,114,321	2,101,748	3,234	51
56	ВИСТА ГРУП ДООЕЛ	2,101,926	1,935,604	144,187	10
57	СЕКТРОН ДООЕЛ	2,031,902	1,728,616	272,958	11
58	ДООЕЛ	1,977,345	1,669,517	274,867	56
59	ИНТЕРТЕК.ИО ДОО	1,920,692	1,910,995	5,623	68
60	КЕРНЕЛ ГРОУП ДООЕЛ	1,902,958	1,677,572	202,017	15
61	АСПЕКТ ДОО	1,878,235	1,098,888	700,890	67
62	СМЕЛТ-ИНГ ДОО	1,857,232	1,737,694	119,537	23
63	ИНТЕЛЕГЕНТ НЕТВОРК СОЛУШН ДОО	1,835,029	1,662,255	155,236	40
64	ВИЗАРД СИСТЕМИ ДООЕЛ	1,831,316	1,437,635	393,165	23
65	САБАХ ТРЕЈД ДООЕЛ	1,780,835	1,754,524	23,426	37
66	БОСОН СОЛУШНС ДОО	1,777,566	1,503,214	244,303	9
67	ИНФОСОФТ СИСТЕМС ДОО	1,773,830	1,677,315	86,359	7
68	НВСП ДООЕЛ	1,773,485	1,613,764	150,175	2
69	ОВЕРНЕТ ДМД ДОО	1,610,515	1,386,677	211,213	37
70	ИНФО - КОД ДОО	1,589,744	1,249,649	305,283	7
71	МАКСАТ ДОО	1,533,839	1,521,703	9,978	23
72	СОФТВЕР4ИНШУРЕНС ДООЕЛ	1,497,190	1,250,670	225,009	42
73	АВЦ ГРОУП ДОО	1,466,176	1,330,564	119,283	6
74	АНТАРИАС ДООЕЛ	1,461,165	1,447,715	12,275	49
75	МЕЛОН ТЕХНОЛОГИИ ДООЕЛ	1,449,870	1,310,548	123,862	43
76	КУИПУ ДООЕЛ	1,429,920	1,393,273	31,928	44
77	ТИМ КОРПОРЕЈШН ДООЕЛ	1,409,201	1,380,935	24,340	22
78	ГДи експорт-импорт ДООЕЛ	1,398,448	1,250,475	125,901	17
79	И-ПРОДУКТС ДООЕЛ	1,354,866	698,253	590,951	1
80	ПРИНТЕК ТЕХНОЛОЏИ ДООЕЛ	1,335,542	1,284,199	44,369	11
81	ПИСТА СОФТВЕР ДЕВЕЛОПМЕНТ ДООЕЛ	1,332,178	916,485	372,847	26
82	ЛАНКОМ КОМПЈУТЕРИ ДОО	1,329,636	1,326,530	2,281	13
83	МИКРОСОФТ ДООЕЛ	1,328,836	1,172,010	131,705	5
84	ДОКСТЕАМ ДОО	1,317,225	1,116,961	176,003	56
85	ПОЛАР КЕЈП МАКЕДОНИЈА ДООЕЛ	1,312,513	1,245,555	55,626	53
86	КИНГ ИЦТ ДООЕЛ	1,311,434	1,263,473	40,900	14
87	ИТ ЛАБС ДОО	1,309,215	1,287,300	15,753	77
88	ВЕРИНТ СИСТЕМС ДООЕЛ	1,306,187	1,218,916	75,061	34
89	ЛОГИНГ ЕЛЕКТРОНИКС ДОО	1,240,775	1,160,410	72,440	20
90	РОУД ГАМЕС ИНТЕРНАЦИОНАЛ ДОО	1,208,124	912,940	267,593	3
91	НЕТ - БИТ ДОО	1,206,624	1,110,005	69,811	14
92	ГТС-ГЕМАК ТЕЛЕКОМУНИКАЦИСКИ СЕРВИСИ ДООЕЛ	1,186,073	1,193,300	0	3
93	ПРОМОТЕЛ ДОО	1,184,178	999,592	165,916	5
94	ИНФИНИТЕ СОЛУТИОНС ДОО	1,182,307	1,138,086	39,472	32
95	ДАТА МЕДИКАЛ СОФТВЕР ДООЕЛ	1,166,313	1,138,979	26,021	66
96	КОСМИК ДЕВЕЛОПМЕНТ ДОО	1,150,680	1,146,518	0	61
97	СЕМОС ДОО	1,137,954	1,126,134	5,216	43
98	КСТ-МАКЕДОНИЈА ДОО	1,135,915	1,032,956	90,530	3
99	КДС-КАБЕЛ НЕТ ДОО	1,134,396	1,125,978	7,576	46
100	ТЕЦХНИЦАЛ СУППОРТ СЕРВИЦЕС ДООЕЛ	1,134,350	1,079,954	48,183	90

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia)

INTRODUCTION TO THE ICT INDUSTRY

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY

C1. GENERAL INTRODUCTION

By the end of 2019 in the ICT Industry the number of economically active companies in the segment has grown for 51% from 1,296 up to 1,957 between 2016 and 2019. The total turnover in 2019 is nearly 880 million euro, expenses 772 million and the net-profit of 103 million euros. In short words, with the current pace, the ICT industry in the near future will be one of the most important in North Macedonia. Additionally in the current crisis caused by the COVID-19 virus, has shown (from unofficial data) that the companies in the IT Segment (unfortunately not in the whole ICT Industry) are more resilient than many other industries that before the crisis were considered as strategic or more important. Still, there should be official data to analyze the exact impact of the crisis and define if there was downfall in revenues and other financials.

The companies within the ICT Industry are divided in 5 subsegments or Software and IT Services, Telecommunication, ICT Manufacturing, ICT Trade and Other IT Services. The main IT subsegment which has the biggest accent of analysis and impact of the whole ICT Industry is "Software and IT Services" which has significant results in the analyzed period, outperforming nearly every industry and segment especially with the employee related financial results offering the biggest salaries and employing nearly 8,500 individuals by 2019.

Until today 2019/20 the Macedonian ICT Industry has impressive results even with weak institutional support. The export is continuously growing from 121 million euros in 2014 to 210 million euros in 2019, but more impressive is the growth of export in the IT segment from 60 million euro to 179 million euros in the same period. The ICT Industry is accounting for significant trade surplus of 121 million euros by 2019 out of the 121 total for the ICT Industry. If the trend continues with the average growth of 25% of the IT Segment in the next few years will reach nearly 300 million euros. Also, 63% of the total value (generated revenue in 2019) of the IT Segment is exported and only 23% imported with share of the trade surplus of 41% which again is highly positive.

The analysis of the import and export is allowing estimation of the domestic IT market which is valued nearly 167 million euros. The value of the market is calculated on a way where from the total revenue of the companies in the IT Segment 283 million euros, the total export of 179 million is subtracted, and the import of 72 million is added with the presumption that all import of IT Services is used by domestic companies. This calculation is not 100% valid, but that is the share (167 million euro) of the total revenue in the IT Industry that is "staying" in the local economy.

From the conducted research the satisfaction of the companies from the formal education system I low averaging bellow 3.00 (at least 4.00 in order to be on satisfactory level). Most of the companies or 51% consider that there is not enough qualified workforce in North Macedonia and mostly they are solving that problem taking interns from Faculties (Formal Educations) of hiring freelancers.

This issue that is huge obstacle for the development of the ICT Industry especially in the "Software and IT Services" subsegment is the education of qualified workforce. From the official data in 2019 there were 6,870 enrolled students on any IT related department from which 10% or 685 have graduated or the ratio is 1:10. On other side the number of employees only in the previously mentioned subsegment is 1,200 per year, which considering the low number of graduated students is creating a huge yearly gap between the supply and demand. From the estimations, if nothing this situation continues, the gap between the needed and employed students will be nearly 5,000 until 2023 presuming that the growth of employees will be 19% and 10% of graduated students.

Also one part is dedicated for analyzing the informal education, which from the data and field research to certain amount is not meeting the needs of the companies but still there are positive aspects. Nearly 66% of the interviewed companies have stated that they would support informal education with other companies, which is directly suggesting that if it is improved and the needs of all stakeholders are met, then it could be important source for new employees.

The interviewed companies for the ICT Export 2020 Report, consider the lack of qualified staff as the biggest challenge they are facing currently, which combined with the competition for qualified employees, 40% are in need of kind of employee related support. In the end for this general overview one of the issues the companies are facing is the "Access to additional finance" but currently there are several financial institutions (including FITR) and organizations which are supporting the innovation and development of ICT Companies. In the previous part of this report they are shown and analyzed.

In the detailed analysis bellow every mentioned aspects in this short conclusion are divided on their elementary pieces so the exact straights, weaknesses, opportunities and barriers are defined.

Research Details: ICT Export 2020 Report

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY

C2.1 TRADE BALANCE OVERVIEW

From the macroeconomic data shown at the beginning of this report, North Macedonia generally has a deficit in the trade balance of 2.01 billion euros in 2019 or 6.42 billion export and 8.43 billion imports. It is strongly suggesting that the country needs industries that are export-oriented and help lower the trade deficit. Also lowering the trade deficit will release part of the foreign exchange reserves which are held by the Central Banks for balance payments of the country. The ICT Industry is one of the potentials because most of the companies especially within the "Software and IT Services" are export-oriented and they have significant added value. The share of the export realized by the ICT Industry is nearly 3.58% from national total (5.86 billion) export and 1.1% in total import.

The whole ICT Industry has been growing from 121 million euros in 2014 to 210 million or 73% growth by 2019 with a 5-year period with an average rate of 11%. On the other side, the import is growing at a lower rate or an average of 8%, or the export is growing significantly higher (in absolute and relative numbers) than the import, thus in the next several years, the trade surplus will be even higher. According to the historical data, the average growth rate of the export is fluctuating as shown in Table C.01 from -2% in 2017 to 25% in 2018, as for the import but with lower rates.

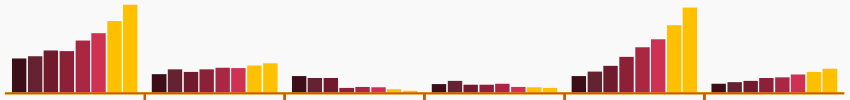
Analyzed separately, IT Segment has the most significant growth (in absolute value and relative growth rate) compared to the Telecommunication segment. IT has grown from 60 million in 2014 to 179 million in 2019 or nearly 200% in a 6-year period, with an average pace of 28%. If the growth continues with the same rate, it can be expected that till 2021 the exported volume of IT Services will be above 278 million euros. From the average import/export growth rates, the export of IT Services has an average growth of 25% from 2015 – 2019 and the import 13% in the same period. Also it is highly positive that the value of the import in IT as well as the average growth is significantly lower than the one of the export, which means that in future the positive gap or the trade balance surplus will grow, which in the end will have a direct positive impact with lowering the national trade deficit.

Telecommunication on the other side as part of the ICT Industry has a constant decrease of the export from 60.89 to 21.18 million euros and an average pace of -13% per year. The import in most of the analyzed years is between 22.2 – 44.2 million euros, with one peak in 2015. Because there is no clearly expressed trend, the export could be higher for several percent points than the one projected, because in the last 6 years it didn't fall below 10 million per year. The import and export rates are fluctuating highly for the Telecommunication segment and again there is not a pronounced trend.

CHART C.01

C2.1 ICT Industry Segment – Import & Export

Values in millions ('000 000) euros



	Export	Import	Export	Import	Export	Import
	ICT		Telecommunication		IT	
2014 y.	121.3	67.03	60.89	32.84	60.41	34.2
2015 y.	129.83	83.64	54.18	44.26	75.63	39.35
2016 y.	149.98	74.72	53.36	30.74	96.64	43.94
2017 y.	147.54	83.75	19.72	29.81	127.8	53.92
2018 y.	183.85	89.86	22.58	34.1	161.24	55.76
2019 y.	210.13	88.25	21.18	22.26	188.95	66.00
est. 2020 y.	252.20	96.81	14.66	21.41	237.54	75.40
est. 2021 y.	308.55	104.95	9.69	18.94	298.86	86.02

TABLE C.01

B1. ICT INDUSTRY

Import & Export Growth Rates

Industry/Segment		2015 y.	2016 y.	2017 y.	2018 y.	2019 y.	2020 Y. (est.)	2021 Y. (est.)	Average (16 – 19)
ICT	Export	7%	16%	-2%	25%	14%	13%	21%	12%
	Import	25%	-11%	12%	7%	-2%	6%	8%	6%
Telecommunication	Export	-11%	-2%	-63%	15%	-6%	-31%	-34%	-13%
	Import	35%	-31%	-3%	14%	-35%	-4%	-12%	-4%
IT	Export	25%	28%	32%	26%	11%	25%	24%	25%
	Import	15%	12%	23%	3%	15%	13%	13%	13%

Source: NBRM- National Bank of the Republic of North Macedonia

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C2.2 TRADE BALANCE OVERVIEW

CHART C.02
C2.2 ICT Industry - Export/Import
Years: 2014 – 2018
In million ('000 000) euros

	ICT Industry	Telecommunication	IT
2014 y.	54.27	28.05	26.21
2015 y.	46.19	9.92	36.28
2016 y.	75.26	22.62	52.70
2017 y.	63.79	-10.09	73.88
2018 y.	93.99	-11.52	105.48
2019 y.	121.88	-1.08	122.95
est. 2020 y.	155.39	-6.74	162.14
est. 2021 y.	203.60	-9.25	212.85

TABLE C.02
B1. ICT INDUSTRY
Trade Balance Growth Rates

Industry	2015 y.	2016 y.	2017 y.	2018 y.	2019 y.	Average growth per year
ICT Industry	-15%	63%	-15%	47%	30%	22%
Segment						
Telecommunication	-65%	128%	-145%	14%	-91%	-32%
IT Segment	38%	45%	40%	43%	10%	35%

Source: NBRM http://www.nbrm.mk/content/statistika

According to the trade balance, the ICT Industry is continuously in surplus and growing (except 2015), from the lowest point in 2015 with 46 million to 121 million euros by 2019, while having a peak in 2016 with 63% growth compared to 2015. The average growth rate is 22% per year in the period between 2015 – 2019, but it is unstable due to the large oscillations in the Telecommunication segment. From the Chart C.02 it is very clear that the companies that are working in IT are the main contributors to the positive trend and export in the whole industry.

The IT Segment had "only" 26-million-euro trade surplus in 2014, growing nearly 350% in just 6-year period and this growth will continue in the next few years, reaching 196 million in 2021. Because the export growth of the IT Segment is directly connected with other aspects such as education, entrepreneurship, start-up ecosystem, and finance, if few current obstacles are overcome in the next period, the export has even bigger potential in near future. The average growth rate of the trade surplus was 35% in the last 6 years, reaching the highest 45% in 2016 and the lowest 10% in 2019 (compared to 2018). The current 2020 will be hard to project, mostly because of the COVID-19 crisis, but the researchers from the communication with the IT companies consider that this industry won't be affected severely so the growth will continue.

On the other hand, the "Telecommunication" segment has a different outcome for each year. From 2014 to 2016 it accounted for trade surplus between 8 and 22 million euros per year. But from 2017 till 2019, records are negative reaching -11.52 million euros in 2018, and this negative trend is projected to continue until 2021. Because this segment doesn't have a straight trend or movement, the average growth per year is –32%, but it should be taken with caution because the oscillations are too high to make a certain conclusion. If the Government wants to intervene to lower this negative trade balance, it should analyze which are the sub-segment that should be stimulated (and there is a real possibility to do so) for local development, thus lowering the need for import.

Even the total value of ICT Export has 3.3% share in total export for 2019 of North Macedonia, the additional 100 million trade surplus (which is very real in the next 3 years) can contribute to lower the negative trade balance for more than 5% (100 million / 1.81 billion). Lowering the negative trade balance will release part of the Foreign Exchange Reserves, which could be used for different and productive purposes. The need for lowering the negative trade balance of the country will be even more needed after the devastating crisis caused by COVID-19 in the first half of 2020.

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY

C2.3 TRADE BALANCE OVERVIEW

When analyzing the export, import and trade balance surplus of the IT Segment, it should be calculated what should be expected from every additional 1 million revenue for trade balance. The analyzed period is between 2016 and 2021 because for the same there are available information about the revenue and other indicators about the companies.

The average export per economically active company is 127,830 euros and its growing up to 139,371 euros despite the 51% growth of number of the companies, which should lower the average what is highly positive. In the same time, the average import per company is decreasing from 58,121 euros in 2016 to 49,619 euro which again is positive because it is increasing the trade balance surplus per company which is getting up to 100,000 euros in 2018 and till will be again at the same point by 2021.

From standpoint of additional 1 million of revenue within the IT Segment, according the numbers of 2019, 660,000 euros will be export, 230,000 will be import and the trade surplus would be roughly 430.500 euros. If the same numbers are extrapolated on additional revenue of 100 million euros there will be 41 million trade surplus which is near 2.3% of the total National trade deficit (by 2018 1.81 billion). Its highly important to stress again that the industries which are export oriented, because the domestic economy is highly dependent from the import, thus there is significant trade deficit that should be controlled and financed with the foreign exchange reserves. The additional trade surplus will release some of the reserves, which could be used in other more productive purposes.

The projections for the future 2020 and 2021 are suggesting that even with higher growth of the number of the economically active companies, the averages will continue with the same rates as before. There is probability that the share of the export in the revenue is overestimated (76% by 2021) but considering that most of the newly opened companies are focused on foreign markets.

This projection is allowing another conclusion, that the Macedonian market for IT Services is 160 million euro, because if from the total revenue of 283 million in 2019 nearly 188 million euro is exported the difference between them are all the services plus the import that is made with presumption that those services are used by Macedonian companies.

TABLE C.03
Import/Export Analysis IT Segment

INDICATOR	2016 Y.	2017 Y.	2018 Y.	2019 Y.	2020 Y. (est.)	2021 Y. (est.)
Revenue (in million euro)	155.86	200.87	235.44	283.60	326.18	367.95
Number of companies	756	935	1050	1288	1592	1958
IT – Export (in million euro)	96.64	127.80	161.24	188.95	223.57	278.15
IT – Import (in million euro)	43.94	53.92	55.76	66.00	72.53	82.09
Trade Balance (in million euro)	52.70	73.88	105.48	122.95	151.03	196.05
ADDITIONAL INDICATORS						
Average Export per company (in euro)	127,830	136,684	153,561	139,371	140,412	142,045
Average Import per company (in euro)	58,121	57,668	53,104	49,619	45,554	41,923
Average Trade Balance per Company (in euro)	69,708	79,016	100,457	89,715	94,957	100,121
Coverage (export/import) (Export/Import)	1.20	1.37	1.89	1.81	2.08	2.39
% share of export in revenue	62%	64%	68%	66%	69%	76%
% share of import in revenue	28%	27%	24%	23%	22%	22%
% share of trade balance in revenue	34%	37%	45%	43%	46%	53%

Note: The revenues and number of economically active companies are sum of the Subsegments "Software and IT Services" and "Other IT" which are the holding the classification codes under which the export and import under the IT Segment is done;

Source: NBRM http://www.nbrm.mk/content/statistika (Trade Balance)

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C3.1 ICT AND HIGHER EDUCATION

One of the main subjects in this report is the lack of a qualified workforce in order to sustain and follow the growth of the ICT Industry. One of the key reasons why there is chronic deficiency of IT employees, can be traced back to the education or the "main source" for people. From the general data, in 2019 there were 6,870 enrolled students in Faculties (Private and Public) on any ICT related programs. From them 10% or 685 have graduated in the same year. On the other side, the "natural" growth of employees in the "Software and IT Services" is on average 1,200 per years which is directly suggesting that the formal education is not fulfilling the market needs. Even there are 10 state and private Faculties which are ICT related, 70% are enrolled on FINKI as a part of Ss. Cyril and Methodious" in Skopje.

The educational system in the past few years has been significantly changed, due huge expansion of informal education centers. The lack of qualified workforce and high salaries in the IT Segment (and other service industries) is seen as a potential to train individuals to in shorter period to fill the gap. Currently there are 53 informal education center, from which most are offering IT related training and education.

It is very important to stress the companies' point of view on the subject, because in the end they are the employers of the individuals from both education channels, formal and informal. From the conducted research where more than 100 "Software and IT Services" companies were interviewed, choose the alternative to take undergraduate students (50%) from formal education instead of employing someone from informal center (29%). That is suggesting that there is significant discrepancy between what the companies need and what the informal centers offer. Still, there are several positive sides on this topic. The first is that there is interest among current employees in other industry segment to requalify and become part of the IT Segment. The second, if the companies involve in the informal education more intensively there is potential to get much better candidates for the job positions. In the part of this report where the suggestion for future are, this alternative is seen as the one possibility to overcome the staff demand.

When analyzing the higher education in North Macedonia through the prism of ICT oriented studies, there are 5 state universities that offer ICT studies and 5 private higher education institutions that offer the same type of studies. There are 6,870 students enrolled in ICT oriented studies in 2019. Out of 5845 graduate students, 685 total are graduated from ICT studies or more precisely 639 graduated from state ICT Universities while 46 graduated from private ICT oriented Universities.

TABLE C.04
ENROLLED AND GRADUATED ICT STUDENTS 2019

	Name of educational institution	Enrolled Students in ICT Programs	% of total ICT Students	Graduated Students on ICT Departments
PUBLIC	University "Ss. Cyril and Methodius" - Skopje	4.786	69.0%	489
	University "St. Kliment Ohridski" – Bitola	503	7.3%	75
	University "Goce Delcev" – Shtip	513	7.4%	33
	Mother Teresa University	100	1.4%	/
	University for Information Science and Technology - Ohrid	375	5.4%	42
PRIVATE	European University - Skopje	30	0.4%	4
	FON University - Skopje	87	1.2%	/
	American College - Skopje	99	1.4%	20
	International Slavic University "Gavrilo Romanovic Derzavin" - Sveti Nikole	37	0.5%	22
	Vision International University	47	0.6%	/
	Total students	**6,870**	**100%**	**685**

Source: State Statistics Office in the Republic of North Macedonia 2019

Based on the data provided from this past year, it is safe to say that the majority of the students opt for public universities when it comes to ICT programs. The main leader according by the number of enrolled students is the biggest and oldest university in the country University "Ss. Cyril and Methodius" - Skopje. This University has two separate faculties dedicated to ICT studies. "Faculty of Electrical Engineering and Information Technology" and "Faculty of Information Science and Computer Engineering" are the two separate faculties. "The Faculty of Electrical Engineering and Information Technology" has 1,313 students while the "Faculty of Information Science and Computer Engineering" has 3,473 students enrolled this year only.

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C3.2 ICT AND HIGHER EDUCATION

Apart from the general answer distribution from the ICT Export 2020 Report, where most of the companies consider that North Macedonia has lack of qualified workforce, it is necessary to define which are the companies that are least satisfied and develop a proposed strategy for their association and joint improvement of the quality of IT staff. According to the market where they sell, the companies that sell on the domestic market are more agreeable that in North Macedonia there is a sufficiently qualified staff with twice the rate of the companies that sell Internationally. Depending on the product they offer, most of the companies that offer Outsourcing are satisfied with the level of qualified staff.

It is very alarming, that the companies which are delivering the export of IT Services or the ones working on international market have significantly higher share exactly 60% consider that there is not enough qualified workforce.

In addition to the suggestion for an association of several IT companies to establish an informal education center and improve the quality of IT staff in the country, the average rate of satisfaction with the current education system in Macedonia by the surveyed companies is 2.79 on a scale of 1- not satisfied at all to 5-extremely satisfied. Comparing based on the market they sell and what kind of service they provide, companies that sell internationally and provide outsourcing showed a higher level of satisfaction based on current education. Still, all average degrees are not passing 3.00 which is average satisfaction and it indicates that the companies consider the formal education is far from the level that's needed.

Again, this results could be recognized as negative (which in the moment is true), but also as notification what should be done in near future to improve the situation. If the companies, consider that the formal education isn't on the level they need, then the formal education institutions should consider restructuring. The companies from one side are employers and they know what they need as knowledge from their employees, but on other, is very obvious that are highly dependent from their clients. If the clients are asking for job position for which currently the faculties, thus the students (future employees) are unable to fulfill, its suggesting that there is significant space for improvement. One of the solutions is higher involvement of the companies and other stakeholders in creation of the curriculum and joint ventures with formal educational institutions in improving the knowledge and preparedness of future employees.

TABLE C.05
D5. Opinion for qualified IT Workforce in North Macedonia

	A1. On which market do you sell your services?			B4. Are you offering final product (software solution), outsourcing or both?		
D5. Do you think that North Macedonia has enough qualified IT Workforce?	**Dom.**	**Internat.**	**Both**	**Final product**	**Outsou.**	**Both**
Yes	47%	24%	25%	21%	44%	29%
No	29%	59%	49%	56%	52%	45%
Maybe	18%	12%	24%	23%	4%	26%

TABLE C.06
D4. Satisfaction from formal educational system in North Macedonia

	A1. On which market do you sell your services?			B4. Are you offering final product (software solution), outsourcing or both?		
Satisfactory rate from formal educational system in North Macedonia	**Dom.**	**Internat.**	**Both**	**Final product**	**Outsourcing**	**Both**
Average score	2.81	2.94	2.70	2.85	2.96	2.63

Source: ICT Export 2020 Report
Information: The interviewed companies are ranking the formal education. As satisfactory degree or point where the satisfaction is on acceptable level is 4.00. It indicates that there are companies which are highly and medium satisfied. Everything bellow 4.00 needs improvement.

Research Details: ICT Export 2020 Report

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C4. ICT AND INFORMAL EDUCATION

Despite the formal higher education there is a large number of informal or vocational training academies in the Republic of North Macedonia. On a global level young people are more likely to be unemployed than adults. With having this in mind, vocational academies and trainings are a perfect way to encourage innovation, competitiveness and prepare all of the citizens for employment in the domestic and in the global labor market.

A special and fairly large priority of the Republic of North Macedonia is the vocational education, which is regulated with the Law on Adult Education and Law for Vocational Education. The system of adult education is promoted by the Centre for Adult Education, an institution established by the government in order to contribute through the adult education to the achievement of socio-economic needs of North Macedonia, to meet the needs of the labor market and to assist individuals in their personal development.

Currently verified (accredited) are 53 informal training providers and academies that are allowed to conduct classes and trainings. Larger informal training centers are Semos Education, Seavus Education Center, Brainster, Data Masters and Creative HUB. They are also allowed to issue certificates that are approved by the state or they are issued by international organizations, institutions or companies (Cisco, Microsoft, Adobe etc.). There is difference between the training centers in aspect what they are offering, curriculums, staff, organization, which is directly influencing the benefits for the students. Part of them are for upgrading the knowledge and other for complete prequalification of employees from other industry segments called "academies".

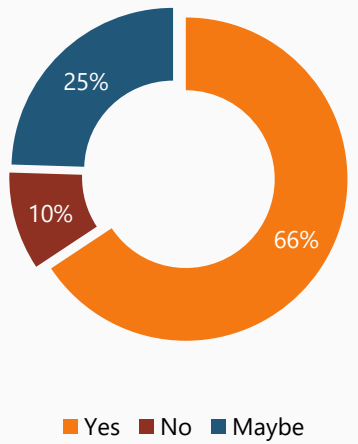
The informal training centers which are mostly for prequalification are on the rise in the past few years because again there is a big interest for the jobs in the IT Segment mostly because of the attractive salaries and employee benefits. There is also Governmental financial support (through the Employment Agency of RNM) for unemployed individuals who would like to have prequalification in other segment (IT also).

Very important information is gathered from a question asked during the field research which was "Would you support informal education (institution/Centers) together with other IT Companies?". Most of the companies or 66% would support and 25% maybe will. Only 10% had stated directly no for the idea, which is highly positive. That is confirming the need, of the previous suggestion, for including the companies in the organization of informal educational centers, directly trough founding new ones or enchasing the existing ones by improving the curriculum.

CHART C.03

D7. Would you support informal education (Institutions/Centers) together with other IT companies?

General answer distribution



Source: ICT Export 2020 Report

The huge gap, between the labor market needs and the offer that should be created mostly by the formal education is leaving significant open space for educational alternatives. But, as analyzed in the suggestions for improvement in the next 3 years, in order to have successful informal education, all stakeholders should be involved. The stakeholders are the students, companies, informal centers, economic chambers and even the formal educations should have significant part. First and foremost is managing the expectations of all sides involved. Without clear focus on what should be expected after the competition of informal education (academy), for the student What he/she will work? Which parts of the job? On what position? What will they learn? and many other question that should be answered to meet the requirements of all interest groups.

Research Details: ICT Export 2020 Report

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C5.1 OVERCOMMING STAFF SHORTAGE

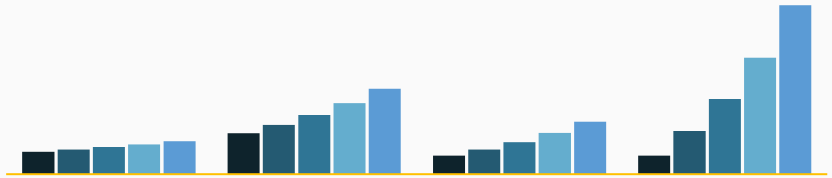
To highlight the seriousness of the situation with the lack of workforce, projection is made to estimate how would the shortage grow in the next few years and how many employees are needed. As shown in the Chart C.04, if the current trend continues, the effect would be severe for both companies in IT Segment and the Macedonian Economy. It should be mentioned that significant part (it cannot be estimated) of the undergraduates are employed before finishing the Faculty while part of them are not finishing at all. Very important information also were the ones analyzed before, that the 51% of the companies in "Software and IT Services" consider that there is shortage of workforce and they are also very dissatisfied with the formal education in North Macedonia.

In 2019, the shortage is 568 employees because the employee growth is 1,253 and the number of graduated students is 685. With each passing year the difference between the supply and demand will be even greater reaching 5,142 in just 5 years from today. This number seems high, but the projection is made only for the "Software and IT Services" subsegment. There is also huge demand for IT experts in Telecommunication, Marketing, Sales, or nearly every company that has software also has the need for IT Person at least for maintenance. If the average expenses per employee in 2019 in the "Software and IT Services" segment was 15,280 euros, the shortage of 568 employees is causing potential loss of 8.67 million euros per year as net-salaries, state tax etc.

This scenario is very pessimistic, but it represents the current situation within the IT Segment, where the companies consider the lack of workforce as main barrier for development. Also, it is showing that the competition for attracting qualified employees could be even more pronounced in near future using different kind of methods for attraction and retention of employees.

This numbers are showing the importance first and most of all National IT education strategy (both formal and informal education) and second the collaboration between all stakeholders within the ICT Industry. The educational centers, mostly formal should meet the market requirements when there is significant demand for their students while there is still the need. The low satisfaction from the formal education, huge demand for qualified workforce and lack of new employees, surely is provoking the formal education to make step forward because the alternative is not very satisfactory for the Faculties and it is opening potential for informal education.

CHART C.04
B2. WORKFORCE SHORTAGE ESTIMATION
Basic year: 2019



	Number of Graduated Students	Number of Employees Needed (Software and IT Services)	Shortage of workforce	Cumulative shortage
2019 Y.	685	1,253	568	568
2020 Y. (est.)	754	1,504	750	1,318
2021 Y (est.)	829	1,804	975	2,294
2022 Y (est.)	912	2,165	1,253	3,547
2023 Y (est.)	1,003	2,598	1,595	5,142

Source: Target Group – Target Group Ltd. / CRM (Central Register of Republic of North Macedonia) / State Statistical Office

Projection assumptions: The number of employees needed is taken as a subtract from the growth of employees in the subsegment "Software and IT Services" between 2019 and 2018. Also the average growth of employees per year in the same segment for the period between 2016 and 2019 is 19%, thus the growth of the number of employees needed will be enlarged by the same percent. The projected growth of graduated students per year is estimated on 10% every next year. Also, the cumulative shortage of workforce is representing the stacked number of employees which are not covered in the previous year.

The estimation is made only for the segment of "Software and IT Services" not taking into account the needs for IT employees in nearly every company especially other ICT Industry segments and subsegments and service-related industries as Marketing.

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C5.2 OVERCOMMING STAFF SHORTAGE

From the interviewed more than 100 companies in the "Software and IT Services" subsegment, 51% consider that North Macedonia does not have adequately qualified staff, and an additional 20% responded with "Maybe", which indicates that more than half of companies perceive the labor market supply as unsuitable for meeting quality requirements. **Also, 75% of all interviewed companies stated that they have difficulties to find and employ qualified IT employees.**

In order to assess the applicability of the produced staff by the companies in the ICT Industry, a question has been asked to the participants themselves on how they deal with the shortage of qualified staff. The general answers layout shows that in the first place most of the companies are taking interns from faculties from formal education and as a second option they choose to hire freelancers. The option to take interns from informal educational centers is used by every third company and it shouldn't be undervalued but on the other hand, indicates that the companies still prefer to take employees from formal education which means they successfully meet the need and expectations.

The approach in this kind of situation by the companies that only sell on the Domestic market is a little bit different, even though in the first place they are hiring interns from formal education and the difference is when as a second option they are outsourcing activities to other domestic IT Companies. Companies that operate only in International Markets primarily employ Freelancers and then chose interns from formal education. Additionally, differences have been noted based on the type of product, where Outsourcing companies are hiring freelancers with the highest share of 48%.

Generally analyzed, it can be noticed that participation in the employment of interns from formal education is significantly higher than the interns from informal educational centers. This means that informal education in North Macedonia is an unavoidable part but does not fully meet the needs of companies in the market as analyzed several times before in this report.

One of the potential opportunities for overcoming this situation is if several companies from the ICT Industry that operate in a similar or the same segment collaborate and establish an informal education center that would meet the needs of both parties, including students. It should produce a positive impact by offering a secure job for students on the one hand and successfully satisfying the qualifications for the required job in a company on the other hand.

CHART C.05
B2. Do you think that North Macedonia has enough qualified IT Stuff?
General answer distribution

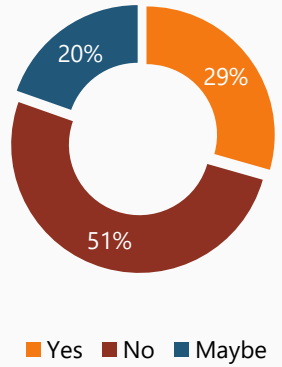


TABLE C.07
D2. Managing lack of qualified workforce

D2. HOW DO YOU MANAGE THAT PROBLEM?	Gener.	A1. On which market do you sell your services?			B4. Are you offering final product (software solution), outsourcing or both?		
		Dom.	Internat.	Both	Final product	Outsourcing	Both
Taking interns from faculties (formal education)	47%	29%	32%	36%	28%	32%	43%
We are hiring freelancers	41%	18%	41%	25%	18%	48%	30%
Outsourcing activities to other domestic IT Companies	33%	24%	26%	22%	25%	28%	20%
Taking interns from informal educational centers	29%	12%	21%	24%	20%	20%	23%
Outsourcing activities to other foreign IT Companies	13%	0%	12%	11%	8%	12%	10%

Source: ICT Export 2020 Report

Research Details: ICT Export 2020 Report

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C6.1 IT ENVIRONMENT, DRIVERS AND BARRIERS

The development of the ecosystem in each country is a result of the success in the availability and level of development of state policies, scientific research organizations, education, human capital, etc. The responsibility for developing such an ecosystem lies not only in the hands of one participant but in more participants, who are representatives of multiple stakeholders. In the conducted research, the companies evaluate the scale from 1-Not problematic to 6-Highly problematic for the indicated aspects in the operation that are at the same time the creators of the IT ecosystem.

Companies in Macedonia for Highly problematic aspects in the business operating pointed out Competition for a qualified workforce with 16% and Institutional Support with 14%. This indicates that these companies are seriously facing the indicated obstacles and they significantly affect the operation and further development of the company. The core activities of the future state policy dedicated to the ICT Industry should address the mentioned problems in order to reduce the following problems or solve them.
If we consider the presence of the problem in the companies with lower intensity, other aspects of the operation are defined, where it is necessary to take certain actions. Specifically, in combination with the other two rates (4 and 5) which indicate that the company is facing a problem to some extent, in addition to Competition for a qualified workforce, Access to additional finance for innovation and development and Qualified Staff show up.

It can be concluded that the problem related to Competition for a qualified workforce is present in every second company, while for 45% of the companies there is the problem with Access to additional finance for innovation and development and Qualified Staff.

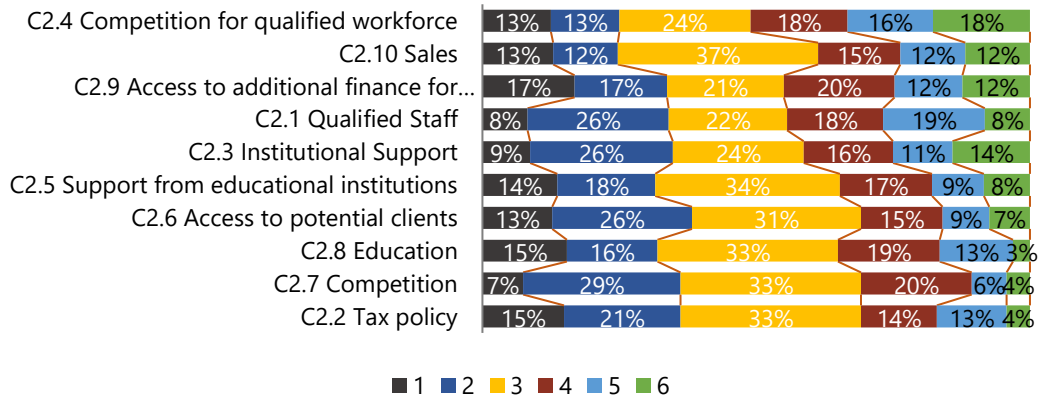
In addition to the above mentioned, with significant participation in making it disruptive for daily business operations, there is also the aspect of Education, where one of the three companies ranks it as problematic.

In conclusion, it is inevitable to define that the biggest problems faced by companies in the ICT industry come from the education system and it entails additional costs for companies related to employee turnover costs, costs for proper staff training, additional investing in programs to attract new employees ,etc. and retransferring financial needs dedicated for another business aspects.

CHART C.06

C2. Rank the following aspects of your business by the degree you consider them as challenge/problematic

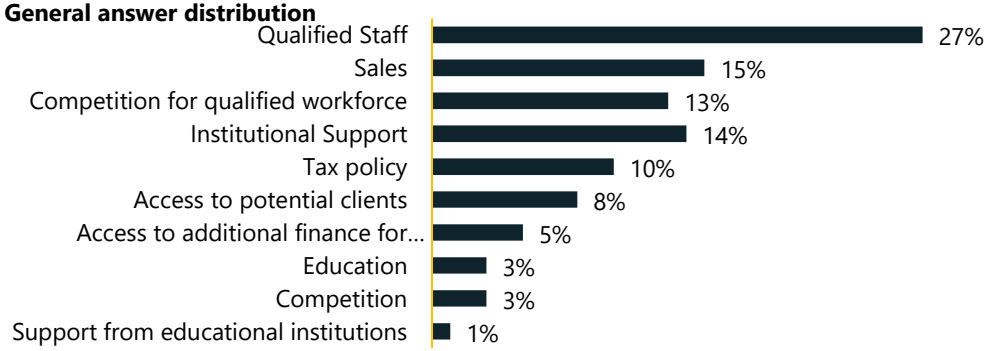
General Obstacles Impact



GRAPH C.07

C3. Which from the previous you consider as the biggest challenge/obstacle for your business?

General answer distribution



Source: ICT Export 2020 Report

Research Details: ICT Export 2020 Report

C. ASSESSMENT OF THE MACEDONIAN ICT INDUSTRY
C6.1 IT ENVIRONMENT, DRIVERS AND BARRIERS

In addition to the above-analyzed factors that are an integral part of the IT Environment, an immanent part are the companies themselves that take a significant role in creating a healthy development environment.

The movement of the entire ICT Industry in the future inevitably depends on the perception of companies for each other. The significance depends on whether there is an objective competitive environment that will move the industry forward or on the other hand, can be a barrier and cause a significant slowdown in development.

According to this year's survey, companies answered question B3. Is there a huge competition (local) for the same services/software solutions you provide? where 60% responded positively, while every third company believes that there is no local competition for the service/software solutions they offer.

Considering the different structure of the companies which took place in the research (all from the ICT Industry) through the correlation with the main sale market and kind of the service they offer some differences are noted. Companies that sell their services in the domestic market (in Macedonia) consider that they face great local competition with + 21% compared to companies that export to international markets. This suggests that perhaps most of the companies that sell locally face consequences that are imposed in parallel with the existence of high competition and market saturation, such as price warfare, staff fluctuations, attempts to internationalize the service portfolio, etc.

In addition, the second correlation with the type of service offered by the company indicates that there is no significant difference in the perception of the volume of competition in the domestic market depending on whether the company is outsourcing or offer a final product. Only companies that are outsourcing with +4% think they are facing huge local competition.

CHART C.08

B3. Is there huge competition (local) for the same services/software solutions you provide?

General answer distribution

TABLE C.08

	A1. On which market do you sell your services?			B4. Are you offering final product (software solution), outsourcing activities or both?		
B3. Is there huge competition (local) for the same services / software solution you provide?	Domestic	International	Both	Final product	Outsourcing	Both
Yes	71%	50%	50%	60%	64%	58%
No	18%	38%	38%	33%	36%	30%
I don't know	12%	9%	9%	8%	0%	13%

Source: ICT Export 2020 Report

Research Details: ICT Export 2020 Report

Z. APPENDIX

GENERAL OVERVIEW
A4. NRI (NETWORKED READINESS INDEX)

TECHNOLOGY

The pillar technology seeks to assess the level of technology that is a sine qua non for a countries' participation in the global economy. The following sub – pillars are part of it:

Access: The fundamental level of ICT in countries, including on issues of communications infrastructure and affordability
Content: The type of digital technology produced in countries, and the content/applications that can be deployed locally.
Future Technologies: The extent of which countries are prepared for the future of the network economy and new technology trend such as artificial intelligence (AI) and internet of things (IoT).

PEOPLE

The availability and level of technology in a country is only of interest insofar as its population and organizations have the access, resources, and skills to use it productively. This pillar is therefore concerned with the application of ICT by people at three levels of analysis: individuals, businesses, and governments.

Individuals: How individuals use technology and how they leverage their skills to participate in the network economy.
Businesses: How businesses use ICT and participate in the network economy.
Governments: How governments use and invest in ICT for the benefit of the general population.

GOVRNANCE

Trust: How safe individuals and firms are in the context of the network economy. This does not only relate to actual crime and security, but also to perceptions of safety and privacy.
Regulation: The extent to which the government promotes participation in the network economy through regulation.
Inclusion: The digital divides within countries where governance can address issues such as inequality based on gender, disabilities, and socioeconomic status.

IMPACT

Ultimately, readiness in the network economy is a means to improve the growth and well-being in society and the economy. This pillar therefore seeks to assess the economic, social, and human impact of participation in the network economy.

Economy: The economic impact of participating in the network economy.
Quality of Life: The social impact of participating in the network economy.
SDG Contribution: The impact of participating in the network economy in the context of the SDGs—the goals agreed upon by the UN for a better and more sustainable future for all. The focus is on goals where ICT has an important role to play, including such indicators as health, education, and environment.

Source: World Economic Forum https://networkreadinessindex.org/

GENERAL OVERVIEW

A4. NRI (NETWORKED READINESS INDEX)

			North Macedonia		Bulgaria		Serbia		Romania		Croatia		Greece		Albania	
			Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
A. Pillar: Technology			**42.41**		**56.11**		**50.54**		**56.25**		**52.75**		**57.02**		**41.31**	
A.I	**Access**		**67.38**	**61**	**74.03**	**50**	**73.79**	**51**	**85.22**	**18**	**74.54**	**49**	**78.60**	**37**	**49.50**	**84**
	A.I.I	Mobile tariffs	57.19	77	64.87	62	66.86	58	100.00	1	70.84	44	69.95	48	52.38	83
	A.I.II	Cost of cheapest internet-enable device (% of monthly GDP per capita)	39.32	78	33.06	93	44.90	66	78.47	9	46.85	61	65.09	26	37.43	82
	A.I.III	Households with internet acccess	67.10	66	70.27	60	71.09	58	79.61	44	80.28	42	69.02	62	25.52	92
	A.I.IV	4G mobile network coverage (% of population)	99.53	18	99.71	16	96.70	48	92.56	62	98.50	35	98.80	34	85.50	73
	A.I.V	Fixed-broadband subscriptions, 10Mbit/s or above (% of totaal subscriptions)	78.06	48	97.71	10	92.91	27	92.92	26	76.31	52	95.64	17	28.65	82
	A.I.VI	International internet bandwidth, kb/s per Internet user	63.12	88	78.57	11	70.25	48	67.77	68	74.44	19	73.08	30	70.45	45
	A.I.VII	Proportion of primary schools with access to Internet for pedagogical purpose	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	46.55	44
A.II	**Content**		**52.18**	**46**	**65.08**	**30**	**58.26**	**39**	**60.73**	**37**	**64.76**	**31**	**63.84**	**34**	**43.51**	**65**
	A.II.I	Digital Participation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	A.II.II	Mobile apps development	65.14	54	80.12	28	71.07	42	72.91	39	72.10	41	75.63	36	59.96	64
	A.II.III	Receipts for the use of intellectual property	0.75	50	0.93	42	1.26	35	0.48	62	1.07	38	0.67	53	0.94	41
A.III	**Future Technology**		**7.67**	**118**	**29.21**	**68**	**19.59**	**104**	**22.78**	**90**	**18.95**	**107**	**28.62**	**71**	**30.92**	**61**
	A.III.I	Availability of latest technologies	N/A	N/A	51.66	66	43.11	80	55.55	69	53.04	63	54.91	60	42.22	82
	A.III.II	Company investment in emerging technology	10.46	113	42.09	50	25.53	88	25.33	89	19.02	101	17.06	103	15.27	107
	A.III.III	Government procurement of advanced technology products	N/A	N/A	42.07	59	28.32	91	13.77	116	12.92	117	18.55	114	57.09	24
	A.III.IV	ICT PCT patent applications per million population	3.46	60	9.81	48	N/A	N/A	13.53	43	17.65	40	19.90	34	N/A	N/A
	A.III.V	Total computer software spending (% of GDP)	9.09	77	27.27	30	0.00	97	27.27	30	9.09	77	54.55	8	9.09	77
	A.III.VI	Robot density	N/A	N/A	2.34	45	0.99	53	6.25	38	2.01	46	6.74	37	N/A	N/A

GENERAL OVERVIEW

A4. NRI (NETWORKED READINESS INDEX)

		North Macedonia		Bulgaria		Serbia		Romania		Croatia		Greece		Albania	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
B. Pillar: Impact		**51.60**		**54.37**		**56.03**		**59.36**		**58.97**		**56.39**		**53.07**	
B.I	**Economy**	**14.84**	**79**	**21.39**	**62**	**26.38**	**46**	**27.38**	**45**	**23.82**	**53**	**23.98**	**52**	**9.15**	**98**
B.I.I	Medium and high-tech industry	29.24	64	37.85	50	33.50	56	54.28	23	39.18	46	26.53	75	8.26	106
B.I.II	High-tech exports	7.66	82	19.17	45	N/A	N/A	19.10	46	16.85	53	24.27	36	0.09	117
B.I.III	PCT patent applications	0.08	75	2.07	46	N/A	N/A	1.15	46	2.70	41	3.02	40	N/A	N/A
B.I.IV	Labour productivity per employee	22.36	66	26.48	59	19.26	71	34.99	49	36.54	48	42.12	39	19.10	72
B.II	**Quality of life**	**58.57**	**76**	**54.83**	**84**	**59.56**	**69**	**48.47**	**44**	**61.69**	**63**	**53.24**	**91**	**67.20**	**47**
B.II.I	Happiness	45.46	81	42.52	88	59.97	52	64.44	44	51.63	67	48.99	73	40.56	92
B.II.II	Freedom to make life choices	50.06	91	45.32	98	48.93	93	73.30	54	37.57	103	8.30	118	68.45	62
B.II.III	Income inequality	72.11	51	67.37	60	61.58	72	71.32	54	83.95	21	71.05	55	89.47	16
B.II.IV	Healthy life expectancy at birth	66.67	50	64.10	60	67.77	48	64.84	58	73.63	33	84.62	21	70.33	42
B.III	**SDG Contribution**	**81.40**	**55**	**86.88**	**42**	**82.14**	**53**	**82.23**	**52**	**91.40**	**30**	**91.94**	**28**	**82.86**	**51**
B.III.I	Access to basic services	94.90	54	90.18	73	87.51	81	89.65	75	97.44	46	99.33	24	92.59	65
B.III.II	Pollution	74.48	88	85.23	61	79.07	80	90.34	36	87.25	52	88.76	44	86.30	54
B.III.III	Road Safety	88.44	26	76.56	45	85.31	29	76.25	46	83.12	35	79.69	38	65.94	56
B.III.IV	Reading proficiency in schools	N/A	N/A	N/A	N/A	N/A	N/A	86.49	27	N/A	N/A	N/A	N/A	86.13	28
B.III.V	Maths proficiency in schools	N/A	N/A	N/A	N/A	N/A	N/A	57.29	36	N/A	N/A	N/A	N/A	N/A	N/A
B.III.VI	Use of clean fuels and technology	67.78	85	95.56	70	76.67	83	93.33	79	97.78	68	100.00	1	83.33	79

GENERAL OVERVIEW

A4. NRI (NETWORKED READINESS INDEX)

			North Macedonia		Bulgaria		Serbia		Romania		Croatia		Greece		Albania	
			Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
DPillar: Governance			**61.24**		**63.54**		**61.49**		**64.99**		**68.82**		**61.62**		**50.17**	
D.I	**Trust**		**55.01**	**64**	**62.38**	**47**	**56.23**	**63**	**65.77**	**44**	**71.94**	**34**	**56.28**	**62**	**46.30**	**83**
	D.I.I	Rule of law	46.86	77	52.66	62	49.99	67	60.76	47	60.74	48	56.82	53	44.39	83
	D.I.II	Software piracy rate	35.14	62	43.24	52	31.08	65	40.54	55	52.70	43	37.84	58	20.27	74
	D.I.III	Secure Internet servers	52.39	67	90.02	12	75.42	41	82.56	29	84.30	20	72.73	46	53.45	65
	D.I.IV	Cybersecurity	85.64	36	76.97	48	68.42	60	60.20	73	90.02	26	55.70	77	67.11	64
	D.I.V	Online trust and safety	N/A	N/A	49.01	66	N/A	N/A	84.78	7	N/A	N/A	58.30	55	N/A	N/A
D.II	**Regulation**		**66.77**	**54**	**67.15**	**53**	**62.44**	**68**	**75.01**	**36**	**64.47**	**61**	**60.96**	**74**	**64.27**	**63**
	D.II.I	Regulatory quality	62.98	43	64.11	42	51.58	66	61.22	51	61.27	49	57.91	55	57.62	56
	D.II.II	Ease of doing business	89.36	16	73.84	57	80.34	43	N/A	N/A	76.75	49	67.55	72	66.36	75
	D.II.III	Legal framework's adaptability to digital business models	N/A	N/A	38.90	73	42.84	64	54.63	38	23.45	107	21.30	108	45.05	55
	D.II.IV	E-commerce legislation	75.00	66	100.00	1	75.00	66	100.00	1	100.00	1	100.00	1	100.00	1
	D.II.V	Social safety net protection	18.48	108	32.80	81	30.47	88	65.38	33	29.21	92	25.97	98	3.21	79
	D.II.VI	ICT regulatory environment	88.03	45	93.25	25	94.41	20	93.83	22	96.14	11	93.05	27	83.40	65
D.III	**Inclusion**		**61.93**	**63**	**61.10**	**67**	**65.80**	**55**	**54.21**	**86**	**70.04**	**44**	**67.63**	**50**	**39.94**	**108**
	D.III.I	E-Participation	66.24	68	85.35	35	78.98	48	66.88	66	73.89	57	85.99	34	72.61	59
	D.III.II	Socioeconomic gap in use of digital payments	62.80	68	50.14	86	73.24	54	41.96	96	86.57	28	78.80	45	22.80	113
	D.III.III	Availability of local online content	N/A	N/A	55.19	59	63.28	42	51.08	68	51.20	67	51.74	65	40.33	82
	D.III.I	Gender gap in internet use	59.18	52	59.35	50	51.52	70	61.38	41	58.08	59	57.88	60	N/A	N/A
	D.III.V	Rural gap in use of digital payments	59.52	75	55.45	81	62.00	73	49.73	96	80.46	5	63.76	70	24.03	112

GENERAL OVERVIEW

A4. NRI (NETWORKED READINESS INDEX)

		North Macedonia		Bulgaria		Serbia		Romania		Croatia		Greece		Albania	
		Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
C. Pillar: People		**40.62**		**45.06**		**46.53**		**41.29**		**46.45**		**53.25**		**41.75**	
C.I	**Individuals**	**52.83**	**70**	**57.09**	**55**	**55.30**	**63**	**56.89**	**56**	**58.13**	**51**	**66.60**	**24**	**55.89**	**61**
C.I.I	Internet users	77.20	43	61.19	73	70.74	56	67.76	62	69.99	58	70.28	57	69.05	60
C.I.II	Active mobile-broadband subscriptions	25.17	77	39.47	27	25.01	78	33.59	46	30.10	59	31.14	56	23.27	81
C.I.III	Use of virtual social networks	52.18	65	53.22	61	41.79	84	55.30	58	46.99	78	53.22	61	50.10	69
C.I.IV	Tertiary enrolment	29.69	68	51.87	26	48.86	34	34.92	62	48.39	36	100.00	1	39.87	51
C.I.V	Adult literacy rate	96.63	32	97.49	26	97.39	27	98.25	19	98.68	16	95.96	34	97.16	30
C.I.VI	ICT skills	36.13	46	39.28	44	48.00	40	51.54	35	54.62	31	48.98	39	N/A	N/A
C.II	**Businesses**	**27.92**	**69**	**32.73**	**52**	**37.20**	**45**	**29.96**	**62**	**39.63**	**43**	**36.10**	**47**	**30.50**	**57**
C.II.I	Firms with website	52.05	57	47.38	62	71.91	28	63.87	40	66.98	34	59.98	48	53.48	56
C.II.II	Internet shopping	51.59	56	27.91	48	25.17	52	16.99	59	37.96	38	28.40	47	8.51	79
C.II.III	Professionals	37.98	44	42.67	37	35.28	47	39.23	40	45.65	33	49.72	24	28.26	58
C.II.IV	Technicians and associate professionals	42.65	50	40.67	53	50.60	40	25.69	78	62.68	22	34.12	60	20.84	86
C.II.V	Extent of staff training	10.88	117	24.01	107	31.60	83	23.73	109	13.81	115	30.27	90	41.39	56
C.II.VI	R&D expenditure by businesses	2.36	62	13.74	38	8.65	45	7.24	48	10.68	40	14.15	36	N/A	N/A
C.II	**Governments**	**41.12**	**71**	**45.36**	**62**	**47.09**	**56**	**37.01**	**86**	**41.58**	**70**	**57.04**	**35**	**38.85**	**83**
C.III.I	Government online services	68.46	68	73.85	54	70.77	57	62.31	77	64.62	72	80.00	41	70.77	57
C.III.II	Publication and use of open data	32.58	49	37.14	41	22.77	64	N/A	N/A	26.75	57	38.94	36	32.43	50
C.III.III	ICT use and government efficiency	N/A	N/A	51.15	46	41.57	68	30.00	96	34.63	87	N/A	N/A	46.09	56
C.III.IV	R&D expenditure by governments and higher education	22.32	65	19.31	71	53.24	26	18.71	72	40.31	40	52.20	28	6.10	94

RESEARCH INTRODUCTION

The research was successfully conducted in the first quarter of year 2020 on a sample of 106 companies in the ICT industry. The focus is on the 5 previously defined areas of operation of companies including their current performance as well as future plans which are key point into further development of the strategy of the entire industry.

These areas were analyzed:
1. Market
2. Services
3. Obstacles
4. Education and employees
5. Institutional support and
6. Investment and Innovation.

The general research aim is to define the main obstacles for companies that do not export outside the domestic market, but also for the existing exporters. In the section on Education and Employees, the problem of "brain drain" and lack of skilled labor is analyzed in detail, as well as how companies deal with it.

Questions have been asked about the most commonly used systems by employers to motivate their employees, ways to further training and improving in order to be the best suit for the job requirements. Also, one part of the report defines the degree of satisfaction with formal and non-formal education as well as the willingness of companies to help create an informal educational center for the future creation of the adequate staff supply.

Section named Institutional support addresses issues related to the types of institutional support most needed by companies, how familiar they are with state tax policy, and to what extent it is a problem in day-to-day and financial operations of companies. Furthermore, individual types of state taxes are analyzed: personal income tax, profit tax, employee contributions and other duties.

The last section focuses on analyzing the level of investment of companies in learning of new technologies and skills, as well as the barriers faced by companies in developing new products and companies that do not invest, which are the most problematic one etc.

The method of analyzing the questions consists mostly of general overview of the question and then correlations of the questions with the market where they sell and type of the product they offer in order to discover the differences if they exist based on this kind of classification.

RESEARCH GOALS

Due to the comprehensiveness of the report dedicated to identifying the challenges and opportunities of the IT export segment in North Macedonia, these are the main and additional goals that should be meet by the processed content.

As a main set of goals are the following:

1. Assessment of the main market and international collaborations
2. Defining the main export obstacles
3. Defining the biggest business challenges
4. Defining workforce trends and future potential
5. Defining the most needed types of institutional support

The additional goals cover information related to prospects for investment and innovation of the companies, motivational methods for employees, managing the staff shortages, etc. Through establishing a correlation between all the questions and two main characteristics of the companies such as the main market where they sell the services and type of the product they sell, the report should deliver an understandable and detailed insight towards specifics of different kinds of companies in the segment.

METHODOLOGY AND SAMPLE

For collecting the information is used the method named CATI (Computer-assisted telephone interviewing) on representative sample of 106 companies with previously structurally defined questionnaires from approximately contacted 400 companies from a publicly available contact sources.