FROM THEORY TO PRACTICE MODERN RESEARCH METHODS AND SCIENTIFIC PROJECTS

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STRESZCZENIE

"From Theory to Practice Modern Research Methods and Scientific Projects" explores the transformation of theoretical knowledge into practical applications, offering a comprehensive guide to contemporary scientific research methods. The author examines the structured journey from hypothesis to implementation, detailing various advanced methodologies and tools pivotal in conducting robust research projects. This work serves as a crucial resource for researchers, students, and professionals eager to bridge the gap between abstract theories and real-world applications. With an emphasis on interdisciplinary approaches, it highlights the evolving landscape of scientific inquiry and underscores the importance of methodological rigor in achieving reliable, impactful results.

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Modern Research Methods in Practice

Spis treści

Entry

The world of science and research is a dynamic space full of challenges and changes constantly. For students and experienced scientists, the research process can resemble a maze full of uncertainty and questions. This book was written to make this maze more clear. I want to guide you step by step from the first scientific inspiration, through formulating research problems, to drawing conclusions that may have real significance for scientific practice. The greatest challenge researchers face today is not only mastering the theory, but also the ability to apply it in practice. Scientific research is the art of combining theory with practice. Understanding this relationship allows you to better plan and implement research projects. My goal is to provide knowledge that will help both novice and experienced researchers develop their skills, especially in the field of research design and conduct. Working as an expert in security, protection of people and property, I have repeatedly realized how important it is for scientists to be able to relate their research to practice. Contemporary challenges require an interdisciplinary approach and flexibility in adapting methodologies to changing conditions. In this book we will look

at different research approaches, techniques and tools that can help you conduct effective and reliable research, and we will also discuss how to avoid the most common mistakes. Each step of the research process discussed in this book is based on my many years of experience. Thanks to this, the book is not only a theoretical lecture, but also a practical guide, full of examples applicable in various fields of science, from the protection of people and property to medicine, dietetics and military topics.

Marcin Niedopytalski, born on August 16, 1982 in Mikołów, is the author of numerous scientific publications, both for children and adults. His work covers a wide range of topics from natural sciences to security, dietetics and military issues. As an expert in the field of protection of people and property, he has gained recognition in both the scientific and practical world.

Marcin Niedopytalski is a security, shooting and self-defense instructor, and his in-depth knowledge and experience make him a valued specialist. His achievements include over 40 diploma theses in the field of protection, self-defense, dietetics, medicine and military science. Over the years, he has gained a reputation for being reliable and thorough in his approach to each project. He bets on it so that his works have not only

theoretical foundations, but also practical application and real impact on the lives of others.

Marcin places great emphasis on understanding research methodology, which makes him an ideal author of a book on modern research methods. His approach to research is based on a combination of traditional methods with modern technologies that enable researchers to better manage data and perform more precise analyses. For Marcin, it is crucial to understand that hypotheses and theses are the foundation of every research work, they determine the direction of research and help focus on the most important questions. In this book, the author shares his experience in formulating hypotheses and emphasizes how important it is to properly place them in the structure of scientific work. A hypothesis should not be a loose guess, but a precise statement that can be verified based on the collected data. This book will help student researchers formulate hypotheses effectively and conduct research in a reliable, scientific, and accurate manner. Marcin Niedopytalski believes that science cannot exist in isolation from reality. Each study should bring tangible benefits, both in theory and practice. His publications are inspiring and at the same time useful in the

everyday work of scientists and students. I cordially invite you to read this book. I hope, that it will become a valuable source of knowledge for you and an inspiration for further research and discoveries.

1.1 Challenges of modern scientific research

Modern scientific research encounters a number of challenges that affect the way it is conducted, the quality of the results and their importance for society. As an expert who has been dealing with various aspects of scientific research for many years, I would like to present my perspective on the key issues faced by scientists around the world. Although the world of science is developing dynamically, many barriers still pose a challenge that hinder the progress and development of knowledge. Let's start by discussing a few of them. One of the most important challenges researchers face is insufficient funding. Many fields of science, especially those that do not generate immediate commercial returns are chronically underfunded. For example, basic research, although crucial to the long-term development of technology and understanding of the world, often does not receive adequate financial support. Funds are usually allocated to projects, that have the potential to quickly commercialize

results, which means that other fields, such as pure mathematics or philosophy of science, may remain in the shadow.

Lack of funding also affects the quality of research. Scientists who do not have sufficient resources are forced to look for alternative sources of financing, which sometimes involves compromises in terms of ethics or quality. Some private companies offer funding for research, but often expect specific results, which can affect the objectivity and integrity of science. As a result, scientists may feel forced to publish results that are beneficial to the sponsor, instead of truly reflecting reality. The second significant problem is the pressure to publish research results. In the world of science there is a saying „publish or perish", which refers to the need to constantly publish in order to maintain your professional position and receive research funding. This system makes that researchers often have to publish many articles in a short time, which can lead to a decrease in the quality of publications. The emphasis on the quantity of publications often outweighs the emphasis on their quality, which can result in errors, insufficient analyses, and sometimes even intentional manipulation of data to obtain publication-worthy results.

This phenomenon is also driven by the so-called „impact factor" an indicator that measures how often articles from a given journal are cited by other researchers. Because many people's research careers depend on publishing in high impact journals, scientists may feel pressure to deliver results which are more „interesting" than reliable. One of the side effects of this pressure is the increase in the number of so-called „predatory journals" journals that offer quick publication of results for a fee, but without reliable scientific peer review. Researchers who desperately need publications can use these „easy" options, which in turn reduces the overall quality of learning. Ethics plays a key role in conducting scientific research. Unfortunately, modern science is increasingly faced with ethical dilemmas. An example would be clinical trials conducted in developing countries, where the standards of protection of the rights of research participants may be lower than in developed countries. While this research may contribute to medical progress, there is a risk that people from less developed countries will become „guinea pigs" without full knowledge of the risks associated with participating in research. Another

aspect is the manipulation of research data to achieve specific results.

Increasingly, we hear about cases of falsification or selective presentation of research results in order to obtain grants, prestige or increase the chances of publication in renowned journals. Such actions undermine trust in science as a whole. Modern science requires more and more interdisciplinarity. Complex problems, that scientists face today, such as climate change, the pandemic or technological innovations, require cooperation between researchers from various fields. However, coordinating interdisciplinary research can be difficult. Different fields of science use different research methods, languages and methods of data analysis, which can lead to communication problems and difficulties in agreeing on common goals.

International cooperation also brings challenges. Although globalization has opened up new opportunities for scientists from different countries, cultural, legal and linguistic differences may constitute obstacles to effective cooperation. In addition, Political tensions between countries can affect access to technology and data, making research collaborations more difficult. Modern scientific research is increasingly data-driven,

which creates new challenges in collecting, storing and sharing data. On the one hand,

Advances in technology enable the collection of huge amounts of data that can be analyzed using advanced IT tools. On the other hand, such data must be adequately protected, especially if it concerns sensitive information such as medical data. Data availability is also a problem. Many research results are not made publicly available, which limits the possibilities for further development of science. Although the movement for open access is growing, there are still many legal and financial barriers that hinder the full use of the potential of modern technologies for sharing knowledge. Introduction of new technologies, such as artificial intelligence (AI) and big data analysis, have opened new perspectives for science. However, these same technologies also pose new challenges for scientists.

AI is increasingly used to analyze data, which significantly accelerates the process of discovering new relationships and regularities in various fields of science. However, dependence on technology can lead to over-reliance on algorithms and models that are not always fully understood by researchers. There is a risk that scientists will come to rely on „black boxes" AI models

that deliver results without fully explaining how they arrived at them. In addition, The development of technology is associated with the problem of „dehumanization" of science. In the past, scientists spent a lot of time manually analyzing data to gain a deeper understanding of the problem. Today, thanks to automation, many research processes have been mechanized, which may lead to the loss of this direct connection with the research material. Another significant challenge for modern researchers is the effective communication of research results both within and outside the scientific community. Many scientists do not have the skills to present complex issues in a way that is understandable to a general audience. This may lead to a situation where important discoveries go unnoticed or are misinterpreted by the media.

At the same time, the need to popularize science is growing. In a world where disinformation spreads faster than ever, the role of scientists in providing reliable, verified information is crucial. Unfortunately, science is often presented in the media in a simplified or even sensational way, which may lead to false conclusions among the recipients. To counteract this, better cooperation between scientists and journalists and educational

content creators is necessary. The last but equally important challenge are institutional barriers, that limit researchers" flexibility and creativity.

Many universities and research institutes operate based on rigid hierarchical structures that can inhibit innovation. Scientists often have to comply with bureaucratic procedures and administrative requirements, which limits their time and energy for actual research. In addition, Scientist evaluation systems are based mainly on the number of publications and grants, which is not always a reliable indicator of the quality of scientific work. In many cases, innovative approaches and novel ideas may be rejected because they do not fit into generally accepted evaluation criteria. The challenges of modern scientific research are complex and multidimensional.

Funding, pressure to publish, ethics, international cooperation, technological progress and institutional barriers are just some of the problems that researchers have to face on a daily basis. Despite these difficulties, science remains one of humanity's most important tools for understanding the world and solving global problems. However, to meet future challenges, a reform of the system, greater openness to interdisciplinarity and an

ethical approach to research are necessary.In addition to the challenges I have already discussed, modern science faces even more subtle problems that are more difficult to define but have a significant impact on research and its future. I would now like to move on to those more complex issues that may seem less obvious at first glance, but they play a key role in shaping the entire scientific community. The basis of all scientific progress is education. Unfortunately, modern educational systems in many countries are struggling with serious problems that may negatively impact future generations of scientists.

In some cases, education systems are too performance-oriented, leading students to focus on passing exams rather than understanding the material. Lack of emphasis on developing critical thinking and problem-solving skills is a serious disadvantage that can result in that future scientists will have difficulty taking on innovative challenges. Moreover, online education is becoming more and more important, as it democratizes access to knowledge on the one hand, and raises questions about the quality of teaching on the other. Although access to educational materials online opens up new opportunities for students from all over the world, At the same

time, there is a lack of mechanisms that could guarantee that students actually acquire knowledge and not just pass subsequent tests.

Modern science, due to its progress, is becoming more and more complex and fragmented. Today, scientists often specialize in very narrow fields, which may lead to the so-called „research isolation". Specialists in a given area may have difficulty communicating with researchers from other fields, which limits the possibilities for interdisciplinary collaboration. Fragmentation of knowledge makes it increasingly difficult to maintain a complete picture of the problem, and science becomes divided into small, separate „islands" of knowledge. On the one hand, such specialization is necessary because new discoveries require a deep understanding of very detailed aspects of a given field. On the other hand, knowledge fragmentation may hinder the integration of different fields, which is necessary to solve complex problems such as climate change,

Health crises or the development of new technologies. Voices are increasingly being voiced that we need more scientists who will be „general experts" (so-called „polymaths"), people who can

combine knowledge from various fields in order to find innovative solutions. Technology is undoubtedly one of the greatest drivers of modern scientific research. However, scientists" increasing reliance on advanced computer tools and algorithms raises some unexpected problems. For example, the introduction of artificial intelligence (AI) into data analysis processes raises the question of how far one can trust the result provided by an algorithm if the researcher himself cannot fully understand how that result was obtained. This is particularly important in fields such as biotechnology or medicine, where decisions made based on data analysis can have a direct impact on people's lives. Increasingly, we hear about cases where errors in AI algorithms lead to incorrect diagnoses or recommendations, which can have tragic consequences. Moreover, the development of technology raises another, more fundamental question how does technology change our definition of science? Once upon a time, science was mainly the domain of human reason, where analytical thinking and a creative approach to problems were crucial. Today, with the increasing automation of many research processes, the question arises whether too much dependence on technology does not

lead to the loss of manual and intuitive skills that were the basis of many ancient scientific discoveries.

One of the biggest challenges that contemporary science faces is the issue of public trust. In the era of disinformation and fake news, it is increasingly difficult to convince the general public to accept scientific facts, especially on controversial issues such as climate change, vaccinations or biotechnology. Modern society is more divided than ever, with various interest groups often manipulating scientific facts to serve their political or economic agendas. This problem is particularly visible in the context of the COVID-19 pandemic, where various conspiracy theories and false information have been widely disseminated, undermining trust in science and medicine. This phenomenon is not new, but in the age of social media it is spreading faster and wider than ever before. Scientists must now not only conduct research, but also fight to ensure that their results are properly understood and accepted by society. The relationship between science and policy is another challenge that is becoming increasingly important. Science should be objective and independent, but in reality it is often entangled in political interests. Policy decisions about research, funding and

regulation can significantly influence what research is conducted and what is ignored.

For example, in some countries, topics related to climate change research may be marginalized due to pressure from industry lobbies. Scientists may have to tailor their research to meet the expectations of politicians or funders, which may lead to compromises on research ethics and quality. Political pressures may also influence decisions regarding the implementation of research results, especially in areas such as public health, environmental protection or the development of new technologies. The globalization of science has brought many benefits, such as faster flow of information, international research cooperation or access to resources from different parts of the world. However, globalization also poses new challenges. On the one hand, increasing competition in the scientific market means that researchers have to fight for limited resources, such as grants or places in prestigious journals. On the other hand, there is increasing pressure for standardization, which may lead to a loss of diversity in methodologies and research approaches that are crucial to the progress of science.

One of the challenges of globalization is also the so-called „brain drain", i.e. the phenomenon of migration of the most talented scientists from developing countries to more developed countries, where they have better career development opportunities. Although this is beneficial for developed countries, it leads to a weakening of scientific potential in the regions that need support the most. Although English has become the lingua franca in science, which greatly facilitates international cooperation, However, language barriers are still a problem for many researchers. Scientists who are not fluent in English may have difficulty publishing their work in international journals, limiting their impact on the global scientific community. On the other hand,

local research conducted in languages other than English is often ignored by the global scientific community, leading to the loss of valuable information and data. The peer review process has long been a pillar of research integrity. However, as the number of scientific publications increases, the peer review system begins to become overwhelmed. It is becoming increasingly difficult to find appropriate experts to review each paper, leading to delays in publication and a reduction in the quality

of reviews. Some journals try to deal with this problem by introducing open reviews, where authors can choose reviewers themselves, but this in turn raises questions about the objectivity of this process.

Additionally, it is problematic that reviewers are often not adequately compensated for their work, which means that many of them do not devote enough time to carefully analyze articles. Consequently, a system of scientific review, which was to guarantee the quality of publications, becomes less and less effective. The final, but perhaps most important, challenge is the responsibility that scientists have in the context of technological and scientific progress. Scientific discoveries can have both positive and negative consequences for society, and decisions made today can affect future generations. An example would be the development of nuclear technology, which has brought both energy and weapons of mass destruction. Scientists must therefore not only focus on discovering new truths, but also on responsible implementation of their results. Modern scientific research is struggling with many challenges that require a new approach. The answer to these problems may be greater emphasis on ethics in research, better resource management,

greater international and interdisciplinary cooperation, and a responsible approach to implementing scientific results into social life. I believe that the future of science lies not only in the hands of scientists, but also of society, that needs to learn to better understand and appreciate research work.

1.2 Research motivation and the importance of the issue

Research motivation and the importance of the issue are key elements of any scientific work, which not only give direction to the research, but also justify its undertaking. To be valuable and meaningful, any scientific research must result from real needs that are important from the point of view of the development of knowledge, technology or society. In this context, a well-formulated research motivation is not only an introduction to the presented problem, but also its foundation on which the entire theoretical and practical structure of the study is based.

First of all, it is worth noting that that each research project should be preceded by an in-depth analysis of the literature on the subject. Only by understanding the current state of knowledge and existing research gaps can specific research goals be set that will have a real impact on the development

of a given field. At this point, there is a need to answer several key questions: why is a given issue important? Why is it worth spending time researching it? What are the potential benefits of solving it? For example, if we study the problem of security in organizations, our research motivation may result from the dynamically changing socio-economic reality, in which threats related to cyberattacks or physical breaches are becoming more and more real. In such a case, the clear justification for the study would be based on the growing number of incidents threatening the security of organizations and society, which implies the need to develop new, more effective solutions and protection strategies.

Research motivation should also address potential shortcomings in existing research. Every field of science is subject to constant development, but not all research problems are fully solved immediately. Often in the literature on the subject we can come across conclusions that suggest the need for further research in a given field. It is worth recalling these arguments and pointing out that the presented study is a response to scientists" calls for further work that will contribute to a better understanding of a given phenomenon. For example, in the field

of personal data protection, despite numerous legal and technological regulations, there are still areas that require more in-depth examination, especially in the context of increasingly advanced information processing methods.

Research motivation is often also personal. For a researcher who specializes in a specific field, conducting research is a form of searching for answers to questions that have been bothering him for a long time. In this case, research may be a natural extension of existing interests resulting from previous work or observations. It is worth emphasizing that the researcher has unique competences and knowledge that allow him to approach the problem in a more comprehensive and in-depth way.

The importance of the issue, which is the development of research motivation, should include arguments regarding the impact of research on the development of science, society or economy. It is worth focusing on a few key areas here. First, what are the benefits of solving the problem? This may be improving the quality of life, developing modern technologies or introducing innovative solutions, that will affect the functioning of entire sectors of the economy. In the case of research related to the protection of people and property, the importance of the

issue may be related to improving the effectiveness of protection systems, which directly translates into the safety of society. In turn, in research on personal data protection,

There is a growing number of violations that lead to financial losses and loss of trust in public and private institutions. The importance of research issues can also be considered in the context of the practical application of research results. In this case, it is worth referring to the fact that how research can be used by specialists in a given field. For example, in the field of information protection, modern technological solutions can be used in companies dealing with data processing, which will contribute to increasing the effectiveness of their activities and minimizing the risk of security breaches. In turn, in research on property protection, the results can be implemented by companies designing modern monitoring and access control systems.

We also cannot forget that that scientific research can have a significant impact on the development of education and the training of future generations of specialists. Research results can be used in the educational process, introducing new standards and teaching methods. In this way, the importance of research

goes beyond its direct application to a given field, becoming an inspiration for subsequent generations of researchers and practitioners.

It is also worth considering the potential social implications of the research being conducted. Often, the results of scientific research influence the way society perceives certain phenomena. For example, environmental protection research can change the approach to issues related to ecology, leading to greater public awareness and the introduction of new legal regulations. In research on the protection of persons and property, the importance of the issue may be related to increasing safety standards, which in the long run may contribute to improving the quality of life of society. Research motivation and the importance of the issue may also relate to contemporary global challenges. In the era of dynamic technological, economic and social changes, many problems take on a new dimension. Sustainability research, privacy protection and information security are of key importance in the context of the global challenges facing the world today. It is worth pointing out the growing importance of interdisciplinary research that combines various fields of knowledge in order to develop

comprehensive ones. The importance of the issue is the foundation of every scientific work. Motivation should be based on actual research needs resulting from the analysis of the literature and the researcher's personal interests. The importance of the issue indicates the practical and theoretical benefits of solving a given problem, taking into account the development of science, economy and society.

Both of these elements not only give meaning to the study, but also constitute an important justification for undertaking it. Continuing with the theme that research motivation and the importance of the issue are key elements of scientific work, it is necessary to further explore these aspects from a practical, theoretical and personal perspective, but also in the context of the development of a given field of knowledge and its impact on society and future research. Very often, research motivation results from the researcher's personal experience, observation or professional expertise. In practice, this means that certain aspects of the research topic may be particularly important to the researcher for personal reasons. For example, a person with many years of experience in protecting people and property may notice gaps in existing security systems or a lack of effective

procedures for responding to new threats, such as cyber attacks or the development of new technologies, such as drones or artificial intelligence-based monitoring systems.

This type of motivation may lead a researcher to set specific research goals that will not only answer questions that bother him personally, but will also contribute to introducing real changes in professional practice. A researcher who is an expert in a given field has a unique perspective, which enables him to identify and formulate research problems in a more precise and thoughtful way than people without appropriate experience. The researcher's personal motivation may also result from the desire to understand phenomena that have previously been ignored or omitted by other scientists. For example, research on the protection of persons and property may concern not only technical issues, but also psychological aspects of the behavior of security personnel in crisis situations. A researcher who has personally encountered these types of situations can be inspired by his own experiences to analyze them from a scientific point of view. One of the most important trends in modern science is interdisciplinarity. In practice, this means that many research problems are not limited to one field of knowledge, but require

cooperation between various areas of science. For this reason, research motivation increasingly results from the need to combine different perspectives, to fully understand the phenomenon under study.

For example, information security research may combine elements of information technology, law, management, and even psychology. In this context, the researcher must not only have specialist knowledge in one field, but also be open to cooperation with experts from other areas, to be able to effectively solve a complex research problem. In such cases, research motivation may result from the need to develop new, comprehensive solutions that will not only be effective, but also take into account various aspects of the problem, such as personal data protection in the context of international legal regulations.

An interdisciplinary approach is also important in the context of global challenges such as climate change, which require integrated actions at the technological, legal, political and social levels. In such a case, research motivation may result from the desire to find practical solutions, which will have a real impact on environmental protection, while taking into account the needs of economic development. It is also worth emphasizing

the importance of research in the context of the development of scientific theories. Each research, even if it is purely practical, contributes to the development of theoretical knowledge in a given field. Theory is the foundation, on which further research and practical applications are based. Therefore, any new theory or development of existing theoretical concepts has the potential to influence future research and may become a starting point for other researchers.

The theoretical significance of a study often involves the identification of new variables, that have not been previously included in the analyzes or with modifications to existing theories to better reflect contemporary realities. For example, research on the protection of people and property may lead to the development of new risk management theories that take into account specific threats related to modern technologies. In this context, research motivation may result from the desire to understand new phenomena that do not fit into the framework of existing theories, or from the need to develop these theories in a more advanced direction. The theoretical significance of the research is also important in terms of its potential impact on education.

New theories and models can become the basis for the development of new curricula, which in turn will contribute to the education of new generations of researchers and practitioners. The importance of research issues often also has a political and legal dimension. Research can provide scientific grounds for introducing new legal regulations or changing existing regulations. For example, research on personal data protection contributed to the introduction of the GDPR regulation, which currently regulates the processing of personal data in the European Union.

In such a case, the research motivation may result from the need to provide reliable scientific evidence that can constitute the basis for making political or legislative decisions. A researcher who is aware of the importance of his or her research for society may be additionally motivated to conduct the research in a reliable and accurate manner so that its results have a real impact on the decision-making processes. The impact of research on policy and legal regulations is particularly visible in areas such as health care, environmental protection and public safety. In these areas, the results of scientific research may lead to the introduction of new regulations that will have a direct impact on

the lives of citizens. For example, research on the effectiveness of various personal protective equipment may contribute to the development of new safety standards that will apply in workplaces.

The practical importance of scientific research is another important element that should be taken into account in every research work. The practical application of research results is particularly important in fields such as technology, medicine or management, where research results can be directly implemented in practice. In the case of research on the protection of people and property, practical importance may lie in the development of new methods of securing buildings, monitoring systems or procedures for responding to threats. The research results can also be used to develop new security standards that will be used by security companies, public institutions and international organizations.

The practical significance of research may also include the implementation of new technologies or procedures that will improve the efficiency of the organization. For example, research into new risk management methods may lead to the

development of more effective crisis management systems, that can be used in various sectors of the economy.

The importance of research issues goes beyond the direct application of research results in practice. Scientific research also has a significant impact on the development of science and education. Each new discovery, theory or research method becomes part of the scientific achievements, which is passed on to subsequent generations of researchers. Research may also contribute to the development of new teaching programs that will better respond to the needs of the labor market and the requirements of the modern knowledge-based economy. For example, research on new technologies may become the basis for developing new fields of study that will prepare students to work in dynamically developing industries, such as cybersecurity or risk management. The importance of research issues often also has a social dimension. Scientific research can contribute to improving the quality of life of society, both through the development of new technologies and by influencing public policy. For example, public health research can lead to the development of new strategies to prevent diseases which in the long run may contribute to extending life

and improving its quality. Research can also help to increase public awareness of specific issues, which in turn can lead to changes in attitudes and behavior. In this context, research motivation may result from the desire to have a positive impact on society through education, promoting scientific knowledge and identifying solutions to the most important social problems, such as personal data protection, environmental protection or public safety.

1.3 Sources of inspiration and identification of the research problem

Writing about the sources of inspiration and identifying the research problem is a key element of any scientific work, because it is with understanding these issues that every solid analysis begins. However, before we move on to detailed arguments on how to correctly present the research problem, it is worth explaining why this issue is so important. Inspiration can come from many places and is not always easy to identify. It is often the result of long-term observation of reality in which a scientist notices certain inconsistencies or gaps in existing knowledge. Scientific literature often talks about „research gaps", which constitute the basis for undertaking new research. The sources of inspiration may be different: from previous scientific research,

through social, political or economic problems, to everyday experiences. In fact, every aspect of the world around us can be a source of ideas for research, as long as the researcher can perceive and interpret them. An example is the discovery of penicillin by Alexander Fleming. It was a random event that didn't initially seem to have any significance, but after further analysis, Fleming saw potential in the phenomenon. His discovery became one of the most important inspirations in the history of medicine, leading to the creation of the first antibiotics. In this context, it is worth paying attention to the fact that inspiration often results from being open to new experiences and being able to see something more than what is visible at first glance. Previous research work, which gives rise to new hypotheses, is often a source of inspiration. When analyzing the literature, researchers notice gaps or ambiguities in existing research and decide to take up the topic to resolve controversial issues. For example, in the social sciences, studies often appear that reach contradictory conclusions about the behavior of social groups, which opens the field for further analysis and interpretation. Understanding differences in outcomes may be a key element to developing new research approaches.

Once inspiration is found, the next step is to identify the research problem. It is a process in which the researcher formulates a research question or hypothesis that will guide the entire research process. A research problem is not only an issue that interests us, but above all a specific issue that requires solution. In order to formulate the research problem well, it is necessary to precisely determine what is missing in the existing knowledge, what phenomenon requires explanation or what relationships require in-depth analysis.

Identification of the research problem is an extremely important stage, because the success of the entire research project depends on its precise definition. The problem should be expressed clearly and unambiguously, and its importance must be justified on the basis of previous research and literature on the subject. The researcher should demonstrate that the problem, with which he deals is of real importance for a given field of science, and its solution will contribute to expanding knowledge about a given issue.

For example, in the field of environmental protection, one research problem may be understanding the impact of microplastics on marine ecosystems. Although the topic

of plastic pollution is widely known, many aspects related to microplastics remain unexplained. A researcher might ask a research question about, for example, how microplastics affect ocean organisms at the cellular level. This problem, if well defined, may lead to the discovery of new facts and mechanisms that were previously unknown. In the sciences, a research problem often takes the form of a hypothesis, i.e. a predicted research result that the researcher tries to confirm or disprove. A hypothesis is a form of statement that must be tested using scientific methods. For example, in medicine, a hypothesis may concern the effectiveness of a new drug in treating a specific disease. Experimental research aims to confirm whether a hypothesis is true or false.

In turn, in the social sciences, the research problem may be more open and does not always have to take the form of a hypothesis. For example, a researcher may ask a research question about how changing technologies affect interpersonal relationships. In such a case, the purpose of the study may be to understand and describe these relationships, and not necessarily to confirm a specific hypothesis. In such cases, research may be exploratory in nature, that is, they aim to discover new relationships and

phenomena. Formulating a research problem is a process that requires thoroughness and precision. The researcher must not only determine what he wants to find out, but also consider how he intends to achieve it. Choosing an appropriate research methodology is crucial because it determines how the problem will be solved. In the case of empirical research, the selection of appropriate research tools, such as surveys, interviews or experiments, is crucial to obtain reliable results. One of the greatest challenges in identifying a research problem is its precise definition. The problem must be narrow enough so that it can be analyzed in detail, but at the same time significant enough to be relevant to the broader scientific context. In practice, this means finding a balance between too general and too specific an approach. If the problem is too general, the research may be superficial and will not produce new discoveries. In turn, a problem that is too detailed may make the research too small in scope to be of real significance. A good example is a situation in which a researcher defines a problem too broadly, e.g. „How do changing technologies affect global economies?" This is too general a question so that they can be analyzed in one research work. A better approach would be

to narrow the problem to a specific economic sector or region, which would allow for a more detailed analysis. The literature on the subject plays a key role in identifying the research problem.

It is on the basis of a review of existing research that knowledge gaps and problems that require further analysis can be identified. A literature review allows the researcher to understand what topics have already been researched, what methods have been used, and what results have been obtained. This, in turn, allows for a better formulation of the research problem and the determination of the methodology that will be most appropriate. However, it is worth remembering that a literature review is not only a summary of previous research, but also a critical analysis of their results. The researcher should consider what the weaknesses of previous research were, what their limitations were, and what new approaches could be used to overcome these limitations. For example, in research on the effectiveness of psychological therapies, one limitation may be the lack of long-term studies to assess whether the effects of the therapy are maintained over time. Identifying such a limitation may be a starting point for formulating a new research problem that will

aim to conduct long-term research. The process of identifying a research problem is a key stage of any research project. The success of the entire study depends on its precise definition.

The research problem should be well justified based on previous research and narrow enough to be analyzed in detail. An important element of this process is also the selection of an appropriate research methodology that will allow obtaining reliable results. Continuing with the issue of sources of inspiration and identifying the research problem, it is necessary to discuss in more detail various approaches to examining literature and research issues, as well as to understand how to avoid too broad, imprecise formulations that may affect the quality and clarity of research. The research context plays a key role in identifying the research problem. Choosing the right context is more than just identifying a research area. A number of factors should be taken into account, such as the topicality of the problem, its importance for society or the potential impact of research results on the development of a given field.

The research problem should be embedded in a real social, economic, technological or cultural context. This ensures that the

research results will have real value and the conclusions will be able to be applied in practice. For example, in information technology research, Topics related to ethics and privacy are becoming more and more important in the era of artificial intelligence. The research problem regarding the role of ethics in the development of AI technology can be placed in the context of contemporary debates on the protection of personal data or the use of AI in the health sector. In such a context, the researcher may ask the question how legal regulations can influence the development of technological innovations while protecting user privacy. Also in environmental protection research, the current climate situation is an important context. The sustainability research problem can be analyzed in the context of increasing environmental regulation and climate change. In such a case, the researcher may ask what resource management strategies are most effective in the face of a changing climate.

Once we have a context in which to set our study, precise formulation of the research problem becomes crucial. In the literature on the subject, one can often encounter the problem of excessive simplification or, on the contrary, too much

complexity of the research problem. To avoid this, the researcher must analyze the available data and literature, which will allow for the creation of a precise, and at the same time an understandable definition of the problem.

For example, if a researcher is analyzing the problem of the impact of new technologies on business development, he or she should narrow his or her research to a specific market segment, such as small and medium-sized enterprises (SMEs), rather than trying to analyze the entire market. Precise formulation of the research problem enables more detailed analysis and insightful results that can later be applied in practice. It is also worth paying attention to the importance of precise selection of variables in research. Often, researchers tend to include too many variables, which can lead to distraction and reduced research quality. A well-defined research problem requires appropriate definition of key variables and the relationship between them.

A well-formulated research problem should lead to research questions, that will help the researcher determine research goals and research methods. Research questions are a tool that allows you to direct your research and obtain specific answers. They

should be clear, concise and achievable within available research methods. Research questions can be divided into several categories.

These may be descriptive questions that seek to understand and describe certain phenomena, or analytical questions that focus on examining cause-and-effect relationships between various variables. It is important that research questions are realistic and achievable within the resources and methods available. For example, if the researcher analyzes the impact of sustainable development on the management of natural resources, his research questions might be: „How does the implementation of sustainable development policy affect the use of water resources in region X?" or „What are the most effective methods of managing water resources in the face of changing climate conditions?" In the case of research that is empirical in nature, A researcher often formulates a research hypothesis that he or she tries to confirm or refute during research. A hypothesis is a form of prediction that suggests a possible solution to a research problem. It should be testable and verifiable using available research methods.

Research hypotheses are particularly important in the sciences, where experimental research is widely used. For example, in a study of the effectiveness of new drugs, the research hypothesis might be: „New drug X is more effective in treating disease Y than drug placebo." The researcher then conducts experiments to confirm whether the hypothesis is true or false. However, not all research requires the formulation of hypotheses. In the social sciences or humanities, where research is often descriptive or exploratory, a hypothesis may not be necessary. In such cases, the researcher focuses more on understanding and describing phenomena than on confirming or disproving hypotheses. The selection of appropriate research methods is closely related to the research problem. Research methodology is a set of tools and techniques that allow you to collect and analyze data in order to solve a research problem. Depending on the nature of the problem, the researcher may choose qualitative, quantitative or mixed methods. Quantitative research most often uses surveys, experiments, and statistical analysis of data. These methods are particularly useful when the researcher wants to obtain specific, numerical data about certain phenomena. For example, research on consumer preferences

may be based on the analysis of surveys, that will provide information about consumers" choices and preferences in the context of specific products. In turn, in qualitative research, researchers use tools such as interviews, content analysis and participant observations. Qualitative methods are particularly useful when the researcher wants to understand the deeper motives and attitudes of the respondents, which may be difficult to capture using quantitative data. For example, research on organizational behavior in companies may include interviews with employees to understand their motivations and problems in their daily work.

One of the most common mistakes researchers make when identifying a research problem is its formulation is too general. The research problem must be precise and clearly defined so that the research can produce specific, useful results. A research problem that is too broad may lead to superficial research that will not provide new knowledge. Another pitfall is insufficient consideration of the existing literature on the subject.

The lack of a robust literature review may lead to duplication of existing research or formulation of research questions that have already been addressed by other researchers. That is why it

is so important to thoroughly understand current research and identify gaps that may become the basis for further research. In addition, the ethical aspects of research should not be forgotten. The research problem should be formulated in such a way as not to violate the ethics of scientific research, and the research should be conducted in a manner consistent with applicable ethical standards. For example, medical research requires the consent of relevant ethical committees, and social research should take into account the privacy and anonymity of respondents. It is worth paying attention to critical analysis when formulating a research problem. The researcher must be able to look at the data and literature from a distance, asking questions about the value of this information. A critical approach to data allows for the identification of potential errors, research gaps and opportunities for further research. Critical analysis of literature involves not only reproducing previous research, but also assessing its value. The researcher should consider what were the strengths and weaknesses of previous research and what new approaches could be used to overcome these limitations. Identifying a research problem is a process that requires an in-depth analysis of the subject literature, a critical

approach to available data and precise formulation of research questions. A well-formulated research problem is the basis for successful research, and its precise definition allows for a better understanding of the phenomena and processes that are the subject of research. It is important that the research problem is embedded in a real context and that the choice of research methods responds to the needs of the researcher. Critical analysis of data and literature on the subject is a key element of the research process that allows for obtaining new, valuable information.

1.4 Tips on writing diploma theses

A. Work as proof of skill. The diploma thesis is, above all, proof that the author is able to use the knowledge and concepts he acquired during his studies and that he is able to apply them in practice to analyze reality. In the context of protection of persons and property, the author demonstrates knowledge of protection principles, legal provisions, as well as techniques and procedures related to ensuring security. Such work also allows you to demonstrate the ability to assess threat situations, plan preventive actions and respond in crisis cases.

2.1 Diploma as a practical value.

Having a diploma is not only a formal confirmation of acquired qualifications, but also a gateway to a further professional career. In the personal and property protection sector, especially in the case of managerial or specialist positions, appropriate education is a key element. The diploma thesis also allows you to present your own ideas for improving security practices, which may be valuable both for the author and potential employers. The work is both proof of mastery of the theoretical foundations of protection of persons and property, as well as a tool allowing you to acquire the education needed for further professional development in this industry. Preferably in line with your interests, but not duplicating what you do every day at work. Not only is it boring, but there is also a risk of plagiarism, because the effects of our work at work are usually the property of the employer, True? The scope of work should be clearly defined in order to focus on a specific topic and avoid too general considerations that may blur the main topic. In the case of work on the protection of people and property, it is best to focus on a specific region, e.g. a city, district or sector that is well known to the author. Such a narrow scope allows for an in-

depth examination of the problem and presentation of accurate conclusions.

If the work concerns the protection of people and property in city X, you can focus on the analysis of local security companies, the security measures used, as well as the actions taken by local authorities. This will make the work more precise, and the conclusions will relate directly to specific problems in city X. The scope of work should also include the analysis of legal regulations regarding the protection of persons and property, the organizational structure of security services and practices used in securing important facilities. Narrowing the topic allows for a more detailed analysis, as well as to formulate recommendations based on real data and observations. The purpose of the work can be defined in two cognitive and practical ways. The cognitive goal is to analyze problems and phenomena related to the protection of people and property, as well as to assess the effectiveness of the actions taken. This makes it possible to understand how different processes affect safety in a given environment. The result of this type of work are specific conclusions regarding the functioning of the protection system and its effectiveness.

The practical goal, however, focuses on introducing real changes in conservation policies and practices. This includes recommendations to local authorities, security companies, as well as other institutions responsible for ensuring security. This allows you to indicate what additional measures or procedures can improve the protection of people and property, thereby increasing the level of safety. The work may also have an exploratory function, examining new solutions, or a descriptive one, documenting the current state of security and analyzing their effectiveness. It can also be explanatory in nature, explaining why certain solutions work better than others and what factors have a key impact on the effectiveness of protection. Depending on the results of the analysis, the work may end with recommendations, that will help introduce real improvements in the protection system. A thesis or hypothesis is the foundation of any research work. In the case of protection of people and property, the thesis may concern the effectiveness of current security activities, security policies or the impact of technology on improving protection. A hypothesis is an assumption that requires verification. It may read, for example: „The use of modern technologies significantly improves the effectiveness

of protection of people and property in city X." This is an assumption based on probability that needs to be confirmed by research. A thesis is a statement that is intended to be proven, e.g.: „Current methods of protecting people and property in city X are not sufficient and require the introduction of more advanced technological measures." This is a more definitive statement that the author proves through analysis of data, examples and field research. To prove a thesis, precise research questions must be formulated, that will allow you to check the truth of the statement, e.g.:

What security technologies are currently used in city X?

What are the main threats to people and property in city X?

Could the introduction of new technologies improve the level of security?

What are the opinions of experts and security services on the effectiveness of current protection methods?

The answers to these questions will allow you to assess whether the thesis (or hypothesis) is correct and whether the introduction of new protection measures is really necessary.

It is important to avoid obvious facts as a thesis, e.g. „The protection of people and property is important" such statements do not require proof because they are generally accepted as true.

For example:

Thesis: Effective protection of people and property in city X requires greater involvement of local authorities.

Research questions:

1. What are the current threats to the protection of people and property in city X?

2. What actions are the city authorities taking to ensure the safety of residents and companies?

3. Are current security measures sufficient,

to effectively protect people and property?

4. What additional actions or measures can be introduced to improve safety in the city?

Based on the answers to these questions, it will be possible to assess whether the thesis has been confirmed and whether the authorities" actions actually meet the protection needs.

Thesis: The local authorities of city X do not take appropriate actions to effectively solve its development problems. The

research questions that arise from this assumption may be as follows:

What specific development challenges does City X face?

What steps are the city authorities taking in response to these challenges?

Do the authorities" actions effectively contribute to solving development problems?

With regard to the protection of people and property, we can ask whether the city authorities take public safety issues into account in their development strategies and what actions they take to ensure the safety of residents and businesses in their area.

Research (work) method.

This is a way of organizing it adopted for the purposes of „work on work", consistent with the standards of modern science. Methods:

experiment

survey research

field research

content analysis

research on existing data

comparative research

evaluation studies.

Work structure.

The work structure should ideally include:

Title page

Contents

Introduction (short form) or Introduction (long form)

Theoretical chapter (key concepts and key theoretical references)

Methodological chapter (research questions and problems, hypotheses, methods, techniques, research tools, research sample, time, research site) Chapter(s) containing research results and bibliography (alphabetical) annex.

The work should therefore have the following structure: T-M-B (theory-methodology-research results). The final layout will depend on the topic of the work and its goals. The theoretical or methodological chapter will not always take the form of a chapter, in some situations, a common theoretical and methodological chapter or appropriate subchapters in, e.g. the introduction, may be sufficient. Justifies the choice of topic. Indicates the scope of work. Formulates a thesis and research questions. Lists the selected test method. Indicates the sources of information used in the work. It briefly outlines the layout

of the chapters. Sometimes as an exception it is unnecessary as a regular chapter if the theoretical findings are poor and the research method is not very complicated. Then, for example, a solid subsection in the introduction will suffice. Generally, however, they are written by reviewing the literature on the subject and defining basic concepts (the so-called conceptual grid) for the needs of the work.

The same can be done with the methodological chapter in justified cases. However, under no circumstances can these issues be omitted. Chapter(s) presenting the results of the analysis. They usually start with a diagnosis and then present individual aspects and phases of analysis. A short chapter discussing the main findings of the work, answering the question whether the thesis has been confirmed (VERY IMPORTANT), and finally containing conclusions (and recommendations, if the results justify formulating them or if this was one of the goals of the work). These are the results of our own or external empirical research, scientific articles and studies, and official statistics data. The recommended formula for providing the source in the bibliography is: Królikowski J., 2004, Magnetic field analyses, Ed. Seriously, Warsaw. In work

concerning the protection of persons and property, the applicable citation standard may be as follows:

If you use scientific literature, if you refer to specific content, you will apply the following rules: if you quote a fragment of the text, provide the author's surname and the year of publication in brackets, e.g. „Modern technologies in the protection of people and property significantly improve the effectiveness of security." (Kowalski 2022, p. 35). If you use several works by the same author published in the same year, you mark each of them with letters, e.g. (Kowalski 2022a), (Kowalski 2022b). When you mention the author directly in the text, you quote in the following way: „As Kowalski (2022) emphasizes, the use of new technologies is crucial in the protection of people and property." However, if you are referring to collective work, in the case of more than two authors, you use the abbreviation „et al.", e.g. (Nowak et al. 2021). Foreign language phrases such as „security management" or „personal protection" should be in italics, but surnames and proper names remain in plain format. If you use footnotes, after the first full citation, further references may be in a shortened form, e.g. „Ibidem, p. 45" or „Kowalski R., 2022, Ochrona…, op. cit., p. 30." Plagiarism.

I advise you to remember that anything written not by you requires the source to be cited if used. The use may involve quoting data or a fragment of text, on presenting a thesis „in one's own words", a finding taken from someone else's material, or using someone else's method or research idea. Using someone else's work without indicating the source is considered plagiarism. A common case of plagiarism involves fragments (sometimes quite large) of official documents, discussions, reports, especially those available on the Internet. Their author (copyright owner) is an office or organization. It is not sufficient to provide a list of the literature used at the end of the work; each use of a given item should be accompanied by an appropriate reference in the text. Works containing even small fragments of other people's texts, which are not clearly marked as quotations (using the „quotation mark" sign) along with the source, may be immediately rejected. Those who are particularly interested in the topic of plagiarism are referred to the provisions of criminal law.

2.1 Thesis and hypothesis in scientific research

The thesis and hypothesis are key elements in scientific research that guide the researcher throughout the research process, helping to define the purpose of the study and what results are expected. Both terms have their own unique meaning and application, although they are often confused or used interchangeably. In fact, thesis and hypothesis have different functions, and understanding these differences is crucial to effective research. A thesis is a statement that a researcher makes at the beginning of his or her research. It is a type of assumption that a researcher intends to prove or disprove in the course of conducting his or her research. The thesis expresses the main point of the study, which constitutes the core of scientific work. This is an affirmative sentence that formulates the researcher's position on the topic and indicates the direction in which the research will develop. A thesis is usually a general statement and may address various aspects of a given research problem. For example, in a paper about the impact of social media on mental health, the thesis could be: „Social media has a negative impact on the mental health of young adults." This statement is general and expresses the researcher's position, which will be developed and supported by arguments later

in the work. The key feature of the thesis is its categorical nature. A thesis is a statement that the researcher considers to be true based on his/her previous research, subject literature or theoretical assumptions. The researcher's task is then to present empirical evidence that will support or disprove this statement. The thesis is therefore a starting point, from which the researcher begins his work.

Clarity and Precision: A good thesis statement should be clear and precise. It should clearly express what the researcher intends to prove. It should leave no doubt as to the position taken by the author of the work.

Specificity: A good thesis statement cannot be too general.

It should address a specific problem or research question. Too broad a thesis may lead to too superficial treatment of the topic, which may weaken the value of the study.

Testability: The thesis should be testable, which means that it can be tested against collected empirical data. A thesis that is too subjective or abstract cannot be verified during testing.

Originality: A good thesis should bring something new to the topic at hand. It should refer to the existing literature on the

subject, but at the same time offer an original approach to the topic.

Meaning the thesis should address a significant research problem. Its formulation should be important for the development of a given field of knowledge or for solving a specific practical problem. A hypothesis is a more specific element of a study that relates to predictions about the results of the study. A hypothesis is a statement that a researcher formulates to test whether there is a relationship between the variables that are the subject of the study. The hypothesis is tested during the study and on its basis it can be assessed whether the thesis is true. Unlike a thesis, which is a general statement, a hypothesis is more specific and addresses specific aspects of the study. The hypothesis must be testable and verifiable based on empirical data. For example, in a study on the effects of social media on mental health, the hypothesis might be: „Users who spend more than 3 hours a day on social media have higher levels of anxiety than users who spend less than 3 hours a day." An important element of a hypothesis is that it must be formulated in a way that allows for its falsification, i.e. the

possibility of proving that it is untrue. A hypothesis that cannot be disproved is not useful in scientific research.

Testability: The hypothesis must be testable based on collected empirical data. It must refer to variables that can be measured or observed.

Precision: A good hypothesis should be precise and unambiguous. It should clearly specify what variables are being studied and what relationships are predicted between them.

Falsifiability: A hypothesis must be formulated in a way that allows it to be disproven. If a hypothesis cannot be disproven, it has no scientific value.

Brevity: A good hypothesis should be concise and clear. It shouldn't be too complicated or convoluted.

Theory-driven: The hypothesis should be derived from existing theory or literature on the subject. It should be a logical extension of what is already known on a given topic.

Null hypothesis (H0): This is a hypothesis that assumes no relationship between the studied variables. For example, in a study on the effects of social media on mental health, the null hypothesis might be: „There is no association between time spent on social media and anxiety levels in young adults."

Alternative hypothesis (H1): This is a hypothesis that assumes the existence of a relationship between the studied variables. This is a hypothesis that the researcher wants to prove. For example: "There is a positive association between time spent on social media and anxiety levels in young adults."

Directional Hypothesis: This hypothesis predicts how the variables are related to each other. For example: "The more time you spend on social media, the higher your anxiety levels will be."

Non-directional hypothesis: This hypothesis assumes a relationship between variables but does not specify how the variables are related. For example: "There is a relationship between time spent on social media and anxiety levels, but the direction of the relationship is unclear."

Thesis and hypothesis are closely related, but they perform different functions in scientific research. Here are the key differences and similarities between them: A thesis is a more general statement that addresses the main point of the study, while a hypothesis is more specific and addresses predictions about the study's results. The purpose of the thesis is to present the main position of the researcher, while the purpose

of a hypothesis is to test predictions about the relationship between variables. Testability A hypothesis must be testable based on empirical data, whereas a thesis is a rather general statement that does not necessarily need to be tested directly. Function in research The thesis serves an indicative function, indicating what is the purpose of the study, while the hypothesis serves an operational function by helping to conduct empirical research. Research Findings In the case of a thesis, the research can confirm or disprove the researcher's main claim. When hypothesized, research can confirm or reject predictions about the relationship between variables. The thesis and hypothesis play a key role in the research process because they help define the purpose of the study and set the direction in which it will develop. Without a clearly formulated thesis, the research could be chaotic and purposeless. The thesis also helps in organizing research work, because it is a reference point for subsequent stages of the study, such as literature review, data analysis and conclusions. The hypothesis, in turn, plays an important role in the testing and verification process. Thanks to a hypothesis, a researcher can conduct experiments or statistical analyzes that will allow him to check whether whether the predictions about

the relationship between the variables are correct. The hypothesis is therefore a key element of the research methodology because it allows for objective and measurable tests.

During the research process, the thesis and hypothesis may develop and be modified. For example, as research progresses, a researcher may decide to change the thesis if new empirical evidence points to a different direction of research. Hypotheses can also change, especially if initial predictions turn out to be wrong. Consider the example of research on the effects of diet on health. The thesis in such a study might be: „A diet rich in vegetables and fruits has a positive effect on heart health." This is a general statement that expresses the main purpose of the study. Based on this, the researcher can formulate more detailed hypotheses that will be tested during the study. The hypothesis could be: „Persons „who eat at least 5 servings of fruit and vegetables a day have lower cholesterol levels than people who eat less than 5 servings a day." This hypothesis is more specific and relates to a specific variable cholesterol levels. The researcher would then conduct empirical research to test whether the hypothesis is true. If the research results confirm the

hypothesis, the thesis will also be confirmed. However, if the hypothesis is disproved, the researcher may decide to change the thesis or formulate new hypotheses that better fit the data collected.

Thesis and hypothesis are inherent elements of scientific research. The thesis constitutes a general research assumption, which expresses the main purpose of the study, while the hypothesis is a detailed prediction about the results of the study. Both of these forms of statements are crucial to effective research because they help define research questions, define variables, and plan research methodology. In empirical research, a hypothesis is tested based on data, and its results may lead to confirmation or refutation of the thesis.

In a bachelor's thesis, both the thesis and hypothesis play key roles in the structure and organization of research, and their proper placement is important for the clarity and coherence of the entire work. To avoid problems related to anti-plagiarism, it is important to use your own formulations and original analyzes when writing your thesis and hypotheses, relying on the literature on the subject, but transforming it into your own

words. Now let's look at how a thesis and hypothesis can be included in a bachelor's thesis.

Placing the thesis in a bachelor's thesis

The thesis should find its place in the introduction of the bachelor's thesis. The introduction is the part of the work in which the researcher introduces the reader to the topic of the study, presents the context and theoretical background, and formulates the general goal of his work. In this case, the thesis serves as the core of the research, because it directs all analysis. The thesis, as a statement that the researcher intends to prove or disprove, should be formulated clearly and concisely to indicate from the beginning in which direction the work is heading. An example may be a thesis regarding the impact of technology on education,

Formulated in the introduction of the bachelor's thesis on the role of artificial intelligence in the teaching process: „Artificial intelligence will revolutionize education in the future, replacing traditional teaching methods and increasing the availability of knowledge." This thesis gives the reader a clear idea of what will be the subject of analysis later in the work and what position the author takes. The thesis in the introduction of the bachelor's

thesis is a general outline of the research problem that will be developed in subsequent chapters. It is worth noting that the thesis does not have to be very detailed, but it should clearly express the author's position on the examined issue. The hypothesis, as a more detailed element of the research, should find its place in the part of the work in which the researcher presents the research goals and methodology. Most often, the hypothesis is introduced in one of the first chapters, usually in the methodological chapter, which appears after the introduction and literature review. Here the researcher defines, what specific predictions are made about the results of the study and what variables will be tested.

For example, in a bachelor's thesis on the impact of social media on mental health, the hypothesis could be: „People who spend more than three hours a day using social media have higher levels of anxiety than people who use them less intensively." Such a hypothesis is more detailed than a thesis and allows it to be tested using empirical data.

Hypotheses often appear in the research goals and questions that the researcher poses during the research process. This is the moment in which the author of the work explains what specific

relationships between variables he intends to investigate. Hypotheses can also be placed in relation to any empirical research that the author of the work conducts.

While the thesis and hypothesis are formulated at the beginning of the work, they are verified only in the final part and in the discussion of the results. The thesis is verified in the final chapter of the work, usually in the conclusions or summary. It is there that the researcher summarizes his research, draws conclusions based on the analysis and answers the question whether the thesis he put forward at the beginning has been confirmed, refuted, or requires modification.

The thesis can be verified by empirical evidence collected during the study, but its evaluation is also based on an extensive literature review and theoretical foundations. The hypothesis, in turn, is tested during the analysis of the research results, which means that its verification takes place in the empirical part of the work. The researcher presents the results of his study, compares them with the predictions contained in the hypothesis, and checks whether the results confirm or disprove the hypothesis. When the hypothesis is confirmed, the researcher can conclude that there is a statistically significant relationship

between the variables under study. If the hypothesis is disproved, the researcher may propose alternative explanations or provide directions for future research. How to write a thesis and hypothesis to avoid anti-plagiarism problems? In order to effectively write a thesis and hypothesis without exposing yourself to anti-plagiarism problems, it is important to create original formulations based on the literature on the subject, but formulating thoughts in your own words. Here are some tips: Using synthesis: Instead of copying passages from literature, try to synthesize the information and turn it into your own sentences. For example, if you use research results from other authors, do not copy them directly, but summarize them and refer to them in the context of your own research.

Paraphrase: Instead of quoting long passages of text, paraphrase them, keeping the meaning of the original but using different words. It is important that any paraphrase is accurate and does not distort the original meaning.

Adding your own value: Try to add your own thoughts and analyzes in each chapter of your work. Even if you rely on literature, create original interpretations and conclusions that result from your research.

Accurate Citation: If you must use someone else's ideas or phrases, always cite the source accurately. This way, you avoid accusations of plagiarism and show that your work is based on reliable scientific foundations.

Creating Original Hypotheses: When you formulate hypotheses, base them on your own thoughts and the results of previous research. try, make your hypotheses unique and address specific aspects of the research problem. Let's consider an example of a bachelor's thesis on the effects of a ketogenic diet on cholesterol levels. To avoid anti-plagiarism problems, the author could formulate the thesis and hypothesis as follows: Thesis: „Ketogenic diet, Due to its high fat content and low carbohydrate intake, it may lead to changes in cholesterol levels, which is important for the cardiovascular health of people following this diet.

Hypothesis: „People who follow a ketogenic diet for at least 6 months have higher levels of LDL cholesterol and lower levels of HDL cholesterol compared to people on a low-fat diet." Such formulations are unique and based on the author's own interpretations, which helps avoid problems with detecting plagiarism. It is important to be concise, precise and clearly

express your research intentions, which contributes to the originality of the work.

2.2 Methodological framework of research

The methodological research framework is a fundamental element of any research project because it guides research activities and ensures that the entire process is carried out in accordance with appropriate scientific standards. Methodological decisions made by researchers are crucial to the success of research, because they determine the way in which research will be carried out and also influence the interpretation of its results. Navigating between theory and practice when making methodological decisions is an extremely complex and demanding task that requires both deep knowledge of the subject literature, as well as the ability to adapt research tools to the specificity of a specific research problem. Methodological decisions are not uniform or clear. Each research project requires an individual approach, because different research questions, scientific fields or research contexts involve different methodological requirements. First of all, it is worth considering the general research approach that will be used in a given project. There are many methodological approaches, from

qualitative research to quantitative research to mixed-method research that combine both approaches. The choice of appropriate methodology depends on the nature of the research question, the purpose of the research and the available resources.

Qualitative research, which focuses on understanding social phenomena, processes and relationships, is often used in the humanities and social sciences. This research allows for an in-depth analysis of the research problem and often leads to the creation of new theories or concepts. Qualitative methods such as interviews, content analysis, observation or case analysis allow you to explore the complexity of the phenomena under study. In the context of methodological decisions, the choice of qualitative methods often involves the need to balance between the theoretical approach to the problem and the practical challenges that research reality poses to researchers. In turn, quantitative research based on numerical data, they allow the analysis of large data sets and are particularly useful when the researcher wants to check the existence of certain statistical relationships. Quantitative research often uses tools such as surveys, tests, experiments and statistical analyses.

Methodological decisions related to quantitative research include the selection of appropriate measurement tools, the method of data collection, and statistical analysis methods. It is also extremely important to ensure an appropriate sample size, which will ensure the reliability and generalization of the results to the entire population. Mixed research combines elements of qualitative and quantitative research, which allows for obtaining a more comprehensive picture of the phenomenon under study. Methodological decisions in mixed research are particularly demanding because the researcher must not only skillfully integrate two approaches, but also ensure the coherence and logic of the entire research process. In practice, this means that the researcher must constantly adapt research tools depending on research progress and the results obtained. Making methodological decisions in the context of mixed research often requires not only good knowledge of literature and theory, but also high flexibility and the ability to adapt research tools to changing research conditions. When a researcher makes methodological decisions, he or she must also consider ethical issues. Scientific research, especially that

involving humans, must be conducted in accordance with specific ethical standards.

This means the need to obtain informed consent from research participants, ensuring their anonymity and confidentiality, and avoiding activities that could expose participants to any risk. Methodological decisions must therefore be consistent with the principles of research ethics, and the researcher must ensure that so that the research process is conducted in a responsible and transparent manner. Another important aspect of methodological decisions is the selection of the research sample. Depending on the type of research, the researcher must decide whether he wants to conduct research on the entire population or on a representative part of it. Quantitative research usually uses random samples, which allow the results to be generalized to the entire population. In qualitative research, on the other hand, the sample is often purposive, which means that the researcher selects participants who can provide the most valuable information about the phenomenon under study.

Sample selection is an extremely important element of the methodology because it determines how reliable and useful the

obtained results will be. We also cannot forget about research tools, which are a key element of every research project. The choice of appropriate research tools depends on the nature of the research, research purpose and available resources. In qualitative research, research tools may include interviews, focus groups, document analysis or participant observation. Quantitative research most often uses surveys, psychological tests, measurement tools and databases. It is important so that research tools are appropriately adapted to the phenomena being studied and enable obtaining reliable and reliable results. When a researcher makes methodological decisions, they often also need to ask themselves how to analyze the data. In qualitative research, data analysis is usually done by categorizing, coding and interpreting the collected information. In quantitative research, data analysis is based on statistical methods that allow checking the relationships between various variables. The choice of appropriate data analysis methods depends on the type of research and available analytical tools. In the context of mixed research, the researcher must skillfully combine both approaches to obtain a comprehensive picture of the phenomenon under study. In the

process of making methodological decisions, the researcher must also consider what theories and concepts will form the basis of his or her research. Theory is the foundation of every research project, because it allows us to understand the research context and formulate research questions. The choice of an appropriate theory depends on the nature of the research and the research goal. Scientific research often uses theoretical approaches that are based on previous research and literature on the subject. However, in some cases, the researcher may choose a more flexible approach that allows for modification of the theory during the implementation of the research project. Methodological decisions are a key element of every research project because they determine the direction of research activities and influence the interpretation of research results. Navigating between theory and practice in the process of making methodological decisions requires both deep knowledge of the subject literature and the ability to adapt research tools to the specificity of a specific research problem. These decisions concern not only the selection of appropriate research methods, but also the selection of the sample, research tools and method of data analysis. They also require taking into

account ethical issues and the appropriate selection of theories, which constitute the foundation of the entire research process. When we move on to the practical implementation of research, after making key methodological decisions, the next step is to properly prepare the research process. To conduct research effectively, regardless of whether it is qualitative, quantitative or mixed research, it is important to understand how to go through the entire research process step by step, ensuring its consistency, reliability and compliance with the adopted methodology. Each study therefore requires careful planning, structuring and following scientific principles, which not only give it a professional character, but also help to obtain valuable and useful results.

The first step in carrying out research is to precisely define the research problem. A research problem is the central issue that research aims to solve. This may be a question the researcher is trying to answer or a problem he or she wants to investigate. Defining a research problem is a process that requires the researcher to thoroughly understand the context in which the problem occurs and the literature on the subject that may provide guidance on how to what research approaches have

already been used in the past. It is important that the research problem is clearly formulated, understandable and well embedded in the theoretical context. Once the research problem is clearly defined, the next step is to define the purpose of the research. A research objective is a general indication of what the researcher wants to achieve through his or her research.

This may be, for example, understanding the mechanisms behind a specific phenomenon, testing certain hypotheses, confirming or refuting a theory, or describing or explaining the relationship between various variables. The research goal should be specific, measurable and achievable. It is also worth remembering that the purpose of the research should be closely related to the research problem and respond to the theoretical and practical needs that result from the analyzed literature. Then we move on to the stage of formulating research hypotheses. Hypotheses are assumptions about the relationships between variables which the researcher puts forward on the basis of existing theoretical knowledge and his or her experience. Hypotheses should be formulated in a way that allows for their empirical verification this means that they must be testable and based on data that can be collected during research.

In quantitative research, hypotheses are particularly important, because they are a starting point for testing statistical relationships between variables. In qualitative research, hypotheses may be less formal and the researcher may formulate research questions in a more open way.

The next step is to select appropriate research tools. Depending on whether the research is quantitative, qualitative or mixed, these tools can be diverse. Quantitative research often uses surveys, questionnaires, measurement tools, and databases. Qualitative research is based on methods such as interviews, observation, content analysis, and case studies. Regardless of the type of research, tools must be appropriately selected to the specific nature of the research, as well as to the type of data that the researcher plans to collect. The choice of tools should be closely related to the research problem as well as the research goals, because it is the tools that determine what data will be collected and how they will be analyzed. Preparing research tools often requires prior testing, which is called piloting. Piloting allows you to check whether the selected tools are appropriate for examining a given problem and whether the questions or procedures introduced are understandable

to research participants. Piloting may also reveal potential problems with research tools, such as unclear wording, too general questions, or difficulties in analyzing the collected data. Conducting a pilot is extremely important because it allows you to make the necessary corrections before the actual research begins. After selecting and testing research tools, the key element is the selection of the research sample. In quantitative research, where the goal is to generalize the results to the entire population, sample selection is particularly important. The sample must be representative, which means that it should reflect the structure of the population from which it is selected. Depending on the size of the population, the researcher may choose a random sample, where each member of the population has an equal chance of being included in the sample, or a purposive sample, where those participants who are most closely related to the problem under study are selected. In qualitative research, the sample is usually smaller and more purposeful, and participants are selected based on their knowledge or experience related to the topic under study. After completing the data collection stage, the moment comes for their analysis. Data analysis is one of the most important stages of the

research process, because it is on its basis that the researcher draws conclusions and formulates answers to the previously posed research questions. In quantitative research, data analysis is based on statistical techniques such as regression analysis, analysis of variance, student's t-tests, and correlation analysis. The choice of appropriate statistical methods depends on the nature of the collected data and the type of research hypotheses that the researcher wants to test. In qualitative research, data analysis involves the interpretation and categorization of the collected information, which allows for the identification of main threads and motifs that appear in the examined material.

Once the data analysis is complete, the researcher must formulate conclusions. Conclusions are the final interpretations of research results that relate to previously posed research questions and hypotheses. Conclusions must be based on the collected data and the analysis performed, which means that they should be reliable, logical and consistent with the adopted methodology. Research conclusions may lead to confirmation or refutation of the hypotheses, as well as to the formulation of new research questions or suggestions for further research. The final step in carrying out research is the presentation of the results.

Presentation of results can take various forms, depending on the type of research and its purpose. Most often, research results are published in the form of scientific articles, research reports or conference presentations. Regardless of the form of presentation, it is important that the results are clearly presented and the conclusions are supported by the data collected. The presentation of the results should also include references to the literature on the subject and to previous research, which allows the results to be placed in a broader scientific context. We also cannot forget about ethical issues throughout the research process. Modern standards of scientific research require that research is conducted in an ethical and responsible manner. This means that the researcher must ensure that the rights of research participants are protected and that the principles of research ethics are complied with. In practice, this means the need to obtain informed consent from participants, ensure their anonymity and avoid situations that could expose them to risk. It is also important that research is conducted in a transparent and honest manner, which means avoiding all forms of plagiarism, fabricating results or manipulating data. Conducting research is a multi-stage process that requires

careful planning, adherence to scientific principles and a responsible approach to data collection and analysis. Each stage of research, from defining the research problem, through the selection of methods, to data analysis and formulating conclusions, must be carried out reliably and in accordance with the adopted methodology. Methodological decisions are crucial to the success of research, so it is important that they are undertaken on the basis of solid theoretical knowledge and practical research experience. Carrying out scientific research is not only a responsibility towards research participants, but also towards the entire scientific community, which expects research to be conducted in accordance with the highest standards of reliability and ethics.

2.3 Evolution of research methods from classical techniques to modern solutions

To understand the evolution of research methods and the role of innovation in the context of research tools, we must first go back to the traditional techniques that dominated the world of science for many years. Initially, researchers relied on classical data collection methods, such as interviews, observations, or surveys, which, although effective in many areas, had their limitations. As technology progresses and scientific disciplines

develop, it turned out that there is a need to improve these tools and adapt them to more complex research phenomena. Evolution of research tools, in both a technical and methodological sense, it reflects changes in the way we perceive and examine the world around us. Initially, research methods were mainly based on direct interaction with the studied environment or target group. Classic methods such as structured interviews, paper surveys or field observations, were not only time-consuming, but also prone to errors resulting from human subjectivity and physical limitations. For example, collecting large amounts of data required significant human resources, and the process of analyzing it could be long and complicated. Nevertheless, these techniques formed the foundation of modern research methodology and are still widely used, especially where traditional approaches ensure high quality data.

With the development of digital technologies, research tools have changed significantly. The introduction of personal computers and the subsequent development of the Internet revolutionized the way how researchers collect, analyze and interpret data. One of the most important achievements was the

emergence of statistical software such as SPSS, R, and Python, which made the processing of large data sets much easier. These programs enabled the automation of many analytical processes, which not only accelerated the pace of research, but also increased their precision and reliability. The next step in the evolution of research methods was the introduction of online tools for data collection. Platforms such as SurveyMonkey or Google Forms allowed for the quick creation and distribution of online surveys, which enabled researchers to reach larger and more diverse groups of respondents in a shorter time. When combined with analytical tools such as Google Analytics and Hotjar, researchers can now collect data in real time, monitoring user behavior on websites and mobile applications. Technologies supporting the data collection process, such as big data, artificial intelligence (AI) and machine learning, have introduced a completely new quality in research. Thanks to them, it has become possible to analyze huge data sets with unprecedented accuracy. In particular, big data allows for the study of trends and patterns, that were previously unavailable due to limitations associated with traditional methods. For example, technology companies can now collect data on millions of users around the

world and analyze their preferences, habits and behaviors to better tailor products and services to their needs. Artificial intelligence and machine learning also play a key role in modern research. AI algorithms can process massive amounts of data in a fraction of the time it would take humans, while eliminating the risk of human error. Machine learning allows you to create predictive models, that can predict results based on previous data, which is particularly useful in market research, medicine, and economics. For example, companies can use predictive models to predict consumer behavior, which in turn allows for better planning of marketing strategies. However, Despite all the advantages of modern tools, their effectiveness depends on the proper adjustment of techniques to the specificity of the phenomenon under study. Not every technology or tool will be suitable for every type of research. For example, while digital methods work well in quantitative research, traditional qualitative methods such as in-depth interviews or participant observations are still irreplaceable in social research, where it is important to capture the context and subjective experiences of the surveyed people. Adjusting research techniques to the specific nature of the phenomenon under study is crucial

to obtaining reliable results. The researcher must carefully analyze what tools will be most effective in a given context. For example, in research on consumer behavior, the use of modern technologies such as big data analysis can provide detailed information about preferences and purchasing habits. However, in the case of research on social phenomena, where it is important to understand individuals" motivations and experiences, traditional qualitative methods may prove more effective. It is also important to understand that modern research tools do not replace traditional techniques, but rather complement them.

In many cases, the optimal solution is to combine various research methods within the so-called mixed methods. This allows researchers to leverage the strengths of both qualitative and quantitative research to obtain a more comprehensive picture of the phenomenon under study. For example, the researcher can conduct in-depth interviews with a selected group of respondents and then supplement this data with the results of surveys conducted on a larger sample, which will allow for a better understanding of the phenomenon from different perspectives. In practice, this means that modern

technologies support research processes, but they cannot completely replace human commitment and intuition. Many experts agree that despite the growing role of digital tools, the value of a researcher's work lies in the ability to think critically and interpret data. Technology can provide data but it is up to the researcher to ask the right questions and draw meaningful conclusions from them. Research tools have come a long way from classical techniques to modern solutions based on digital technologies. This evolution was driven by increasing research demands and technological advances that opened up new opportunities for collecting, analysis and interpretation of data. Technologies such as big data, artificial intelligence and machine learning play a key role in modern research, allowing huge amounts of data to be collected and analyzed more efficiently than ever before. However, despite these innovations, traditional research methods remain an important element of the research process, especially in social and qualitative research. Adjusting research techniques to the specificity of the phenomenon under study is crucial to obtaining reliable results, and the optimal approach often turns out to be a combination of different methods in a mixed approach. At last, it is the human skills,

critical thinking and commitment of the researcher that are crucial to fully understanding and interpreting the data that technology provides. Research in the area of protection of people and property is an extremely important field that requires precise adjustment of research tools to the specific threats and challenges, that this industry brings. The protection of people and property is based on risk analysis, assessment of the effectiveness of existing security systems, and verification of the ability to respond to incidents in real time. In this context, modern technologies and traditional research methods can be closely integrated, to obtain a comprehensive picture of the issues being investigated and design effective protective solutions. One of the key challenges in protecting people and property is a thorough understanding and analysis of potential threats. To achieve this, research should include both analysis of historical security incident data, as well as predicting future threats based on the analysis of trends and behavioral patterns. Traditional research methods, such as reviewing police reports, analyzing surveillance video, and interviewing security personnel, can provide valuable information about typical threat scenarios. Nevertheless, these methods can be time-consuming

and limited by researchers" subjective interpretations. The introduction of digital technologies such as big data analysis, artificial intelligence (AI) and real-time monitoring tools can significantly increase the effectiveness of research processes in the protection of people and property. For example, big data analytics can help identify criminal patterns based on historical data, such as the times and locations of incidents, as well as the types of criminal tools used. AI algorithms can predict which places are most vulnerable to future threats, which allows for more precise deployment of protective resources, such as security personnel and surveillance cameras. Technologies supporting the data collection process in the protection of people and property also include modern monitoring and detection systems that not only record images in real time, but they also automatically analyze this data to look for suspicious behavior. In practice, this means that modern surveillance cameras can be equipped with face, motion and even emotion recognition algorithms, which allows for faster detection of potential threats. Combined with analytical systems, such solutions can automatically generate alerts when suspicious behavior is detected, which shortens the response time of security services

and increases the effectiveness of prevention. However, a key element in research on the protection of persons and property is also adapting research techniques to the specific nature of the phenomenon under study. For example, in the case of physical protection of facilities, research should include both an assessment of the effectiveness of security systems, such as alarms, locks or barriers, as well as an analysis of the response of security personnel to various types of incidents. For this purpose, computer simulations can be used, which allow modeling various threat scenarios and assessing how protective systems respond to these threats under controlled conditions. Such simulations may include both internal incidents, such as theft or burglary attempts, and external threats, such as terrorist attacks or sabotage attempts. Additionally, in research on the protection of people and property, it is important to use data from penetration tests and security audits. These tests involve simulating attacks on protective systems to check their resistance to various types of threats.

Security audits, on the other hand, allow for the assessment of compliance of existing protective systems with applicable regulations and standards. In the case of audits, both traditional

methods, such as documentation review and interviews with employees, as well as modern technologies can be used, such as security information management (SIEM) systems that monitor and analyze logs from security systems in real time. It is also worth paying attention to the importance of research on human behavior in the context of protecting people and property. Human errors are often the main factor leading to security breaches, therefore, research on the psychology of security workers, their reactions to stress and their decision-making skills in crisis situations are crucial for the effectiveness of security systems. These studies may include interviews and observations, as well as laboratory experiments, which allow for the analysis of employees" reactions to simulated threat situations. The use of modern digital tools, such as VR (virtual reality) and AR (augmented reality) systems, can additionally increase the effectiveness of training for security staff. Thanks to VR simulations, Employees can participate in realistic threat scenarios that allow them to improve their response skills in a safe environment. This type of training can also be monitored and analyzed to assess what decisions employees make at critical moments and how these decisions affect the

effectiveness of protection. Protection of people and property is also an area where risk analysis plays a key role. Risk analysis research should include both the assessment of existing threats and the prediction of new, potential sources of risk. For this purpose, a variety of methods can be used, such as SWOT analysis, PESTEL analysis, as well as more advanced techniques, such as Monte Carlo analysis, which allows you to simulate various risk scenarios and assess the probability of their occurrence. Modern digital tools, such as risk management software, enable the automation of many risk assessment processes, allowing for more effective security management. Another important aspect of research in the protection of people and property is the assessment of the effectiveness of emergency procedures and crisis management plans. This research should include both analysis of existing plans and testing them in practice through crisis simulations. For this purpose, methods such as war games can be used, that simulate various crisis scenarios and allow for the assessment of how effectively the organization is able to respond to these threats.

Research on crisis management should also include an analysis of internal and external communication during a crisis, as well

as an assessment of the effectiveness of cooperation with other services, such as the police, fire brigade or emergency medical services. In the context of protecting people and property, especially in large organizations or public institutions, a key element of research is also the assessment of monitoring and access control systems. Modern technologies, such as biometric access control systems, cameras with facial recognition function or automatic license plate recognition systems are increasingly used to increase the level of security. Research into the effectiveness of these systems should include both technological testing and evaluation, how they influence people's behavior and their sense of security. It is worth noting that the introduction of advanced technologies may raise privacy concerns, so research should also take into account ethical and legal aspects related to monitoring. Research in the protection of persons and property is a comprehensive process, which requires a combination of both traditional and modern research methods. The evolution of research tools, such as big data analysis, artificial intelligence, VR systems or biometric access control systems, has opened up new possibilities in the field of threat analysis and the effectiveness of protective systems.

However, the key challenge remains to match appropriate techniques to the specificity of the phenomenon under study, which requires advanced knowledge in the field of technology, psychology and risk management. Modern research tools allow for more precise and effective threat analysis, which in turn contributes to increasing the level of security in organizations and public institutions. However, the ultimate success in protecting people and property depends on the skills of researchers and specialists who can use these tools in an integrated, effective and responsible way, taking into account not only technical aspects, but also ethical and social.

2.4 Formulating hypotheses based on the research problem

Research hypotheses are one of the fundamental elements in the process of conducting scientific research. They constitute bridges connecting theory with practice, and their correct formulation and verification are crucial to obtaining reliable results. To understand the role of hypotheses, we need to look at how they are formulated, how they fit into the research structure and what tools are used in the process of their verification in various types of research. Research hypotheses usually result from the analysis of the research problem that the scientist intends

to solve. The research problem is at the heart of every study, and without defining it, it is difficult to conduct valuable research. Therefore, a hypothesis is an attempt to answer a question that results from the research problem and contains certain assumptions that the researcher wants to test. Formulating hypotheses, however, is not an intuitive process.

It requires solid theoretical knowledge and understanding of the context in which the research problem is located. In practice, the formulation of a hypothesis often begins with a literature review, which provides information about existing theories and research related to the problem. On this basis, the researcher formulates assumptions which may be true or false. An important element in formulating a hypothesis is its precision. The hypothesis should be clear, unambiguous and allow for objective verification. An example of a correctly formulated hypothesis may be: „People who regularly practice sports have better results in psychomotor tests than people who do not practice sports." This hypothesis is precise because it clearly defines the variables (physical activity and results in psychomotor tests) and suggests the relationship between them. There are two main types of hypotheses in scientific

research: null hypotheses and alternative hypotheses. The null hypothesis proposes that there is no relationship or difference between the variables, while the alternative hypothesis suggests that there is an association or difference.

For example: H0: „There are no differences in the results of psychomotor tests between people practicing sports and those not practicing sports", H1: „People practicing sports have better results in psychomotor tests." Hypotheses play a key role in the structure of scientific research. They perform several functions, which allow researchers to better understand the phenomena under study and organize the research process. Hypotheses help define what the researcher wants to focus on. The assumptions contained in the hypotheses indicate specific aspects of the research problem that are to be analyzed. This makes research more focused and less chaotic. Hypotheses provide structure for the research process. They determine what variables will be examined, how they will be measured and how they will be analyzed. In quantitative research, for example, researchers can predetermine what statistical tools will be used to analyze data to test hypotheses. Hypotheses are formulated in such a way that they can be empirically verified. This means that the

researcher can collect data and conduct tests to see if the hypothesis is true. Therefore, the hypothesis should be testable which means that it must be possible to collect data that can confirm or disprove the hypothesis. Thanks to clearly formulated hypotheses, the researcher can more easily interpret the obtained results. If the data support the alternative hypothesis, the researcher can conclude that a relationship exists between the variables. However, if the data do not support the alternative hypothesis, the researcher rejects it in favor of the null hypothesis, which also provides valuable information.

In scientific research, hypotheses can be tested using different methods, depending on the type of study, quantitative or qualitative. In quantitative research, hypothesis testing is usually done using statistical methods. The main goal is to check whether the data collected during the research confirm the alternative hypothesis, or whether it should be rejected. This process involves several key steps: The researcher collects empirical data that can confirm or disprove the hypothesis. In quantitative research, this data is usually in numerical form, e.g. test results, measurements, answers to surveys with closed questions. Depending on the type of data and the specificity

of the study, the researcher selects an appropriate statistical test, e.g. Student's t-test, analysis of variance (ANOVA), linear regression, etc. The choice of test is crucial because an incorrectly selected test may lead to erroneous conclusions. After selecting the test, the researcher begins to calculate statistical values that allow to determine whether the differences between the groups are statistically significant. If the p-value is less than the established level of significance (e.g., 0.05), the researcher may reject the null hypothesis and accept the alternative hypothesis. Based on the results obtained, the researcher draws conclusions regarding the studied variables. If the alternative hypothesis is confirmed, the researcher can conclude that there is a relationship between the variables. If the hypothesis is rejected, the researcher may look for other relationships or conclude that the relationship under study does not exist. Hypothesis testing in qualitative research differs from quantitative research, because qualitative research focuses on understanding phenomena in their natural context rather than measuring variables numerically. Therefore, the approach to hypotheses is often less formal and more flexible. In qualitative research, hypotheses are often developed during data collection, rather

than before the study begins. Researchers studying organizational culture, for example, can formulate hypotheses about patterns of behavior in an organization based on interviews and observations. In qualitative research, hypotheses are verified through the so-called triangulation, i.e. the use of multiple data sources, research methods and perspectives, to obtain a more complete picture of the examined reality. For example, a researcher may compare interview results with document analysis or participant observation. In qualitative research, the approach to hypotheses is much more flexible than in quantitative research. Hypotheses may be modified during research in response to new information and data. For example, a researcher studying a social group may revise his or her initial assumptions about the group's structure based on new observations. When interpreting the results of qualitative research, hypotheses are contextualized in a broader social, cultural or organizational context. This means that the results are not only analyzed statistically, but also by their significance in a given context.

Research hypotheses play a key role in scientific research because they allow the formulation of assumptions that can be

verified empirically. Formulating hypotheses is based on the analysis of the research problem, and their testing can be carried out in both quantitative and qualitative research. In quantitative research it is crucial to use statistical methods, while in qualitative research it is important to use various techniques such as triangulation. Regardless of the method, Hypotheses are an integral part of the research structure and help researchers draw conclusions about the phenomena under study. Hypothesis verification is not a clear-cut process, because in research reality we rarely deal with situations in which it is possible to completely confirm or completely reject a hypothesis. There is always a margin of uncertainty, and research results must be interpreted in the context of methodological limitations, research conditions, and the possibility of errors. The rest of the text will focus on a deeper understanding of the processes involved in verifying hypotheses in scientific research and on the role their role in the context of various research methods, both quantitative and qualitative. One of the key threats in the hypothesis testing process is the possibility of making an error. There are two main types of errors in scientific research: type I error (α) and type II error (β). also called the false positive error,

is the rejection of the null hypothesis even though it is true. This is a situation in which the researcher concludes that there is a relationship or difference between the variables being studied, when in fact there is no such relationship. Often, this type of error results from inaccurate data or inappropriate selection of statistical tests. To minimize the risk of making a type I error, researchers set the significance level, most often at 0.05. This means that they accept a 5% chance that rejecting the null hypothesis will be the result of error.

A type II error (false negative) occurs when a researcher fails to reject the null hypothesis even though the alternative hypothesis is actually true. In this case, the scientist fails to see the connection or difference that actually exists. Errors of this type may result from insufficient data (small sample), low statistical power of the test or too small a difference between the study groups to be detected. To reduce the risk of committing a Type II error, researchers can increase sample size, improve the quality of research instruments, or use more advanced statistical tests. That the risk of making type I and II errors always exists, regardless of the quality of the research. Therefore, researchers

must take into account both the possibility of error and the limitations resulting from the adopted methodology.

Another important issue related to hypothesis testing in quantitative research is statistical power. Statistical power is the probability that a statistical test will correctly reject the null hypothesis if the alternative hypothesis is true. High statistical power means there is a greater chance of detecting an association or difference if it actually exists. Statistical power depends on several factors, including sample size, level of significance, and effect size, which is the degree to which variables are related to each other. Effect size plays a key role in interpreting research results because it tells how strong the relationship between the variables being studied is. Even if the relationship is statistically significant, it may be very weak and not have much practical significance. In quantitative research, the aim is to ensure that the statistical power is as high as possible, which allows for minimizing the risk of making type II errors. Increasing power can be achieved in several ways, including: by increasing the number of units tested, improving the precision of measurement tools or using more sensitive data analysis methods. In experimental research, hypotheses are tested using data

collected under controlled conditions. Experiments allow researchers to manipulate independent variables and observe their effects on dependent variables. which enables a better understanding of the studied phenomena. In the context of hypothesis testing, experiments provide precise data that can confirm or disprove assumptions. In experiments, researchers often use control groups and experimental groups. The control group is a group that is not subjected to any interventions, while the experimental group is the one in which the independent variable is manipulated. By comparing the results of both groups, researchers can assess whether the independent variable had a significant impact on the study result. For example, in a study designed to evaluate the effect of a new drug on blood cholesterol levels, an alternative hypothesis might be: „The drug lowers blood cholesterol levels." The researcher gives the drug to the experimental group and a placebo to the control group, and then compares the results of both groups. If the cholesterol level in the experimental group is significantly lower than in the control group, the researcher may reject the null hypothesis and accept the alternative hypothesis.

It is worth noting that randomization, i.e. the random assignment of subjects to control and experimental groups, also plays a key role in experimental research. Randomization minimizes the risk of external factors that could influence the results of the study, which increases its reliability. Unlike experiments, correlational research aims to examine the relationship between variables without introducing any intervention. In correlational research, hypotheses are formulated based on observations and involve checking whether there is a relationship between two or more variables. Hypothesis testing in correlational research is often more complicated because a relationship between variables does not automatically imply a cause-and-effect relationship. For example, the correlation between time spent watching TV and being overweight does not mean that watching TV causes you to be overweight there may be another, unknown factor which affects both of these variables.

In correlational research, researchers use various indicators, such as the Pearson correlation coefficient, which measures the strength and direction of a linear relationship between two variables. Hypotheses in this type of research may be, for

example „There is a positive correlation between time spent exercising and life satisfaction." Verifying such a hypothesis involves calculating the correlation coefficient and checking whether it is statistically significant. Regression analysis is another statistical tool used in hypothesis testing, especially in studies that seek to predict the value of one variable from other variables. In the context of research hypotheses, regression analysis allows for the assessment of the extent to which independent variables influence the dependent variable. Hypotheses tested using regression analysis may concern, for example, the impact of education, age and professional experience on the salary level. A researcher may formulate the hypothesis that „Higher education is associated with higher levels of remuneration." In this case, regression analysis allows you to determine the extent to which education, as well as other variables such as age and experience, affect salary. The results of regression analysis are interpreted on the basis of regression coefficients, which show how much the value of the dependent variable (e.g. salary) will change with a unit change in the independent variable (e.g. education level), assuming that the remaining variables are constant. The statistical significance

of the regression coefficients indicates whether the researcher can reject the null hypothesis, i.e. the statement that the independent variable has no effect on the dependent variable. Although hypothesis testing is traditionally associated with quantitative research, in qualitative research it is also possible to formulate and verify hypotheses, although the process is slightly different. Qualitative research is not about numerically confirming relationships, but rather about understanding phenomena in their natural context.

One of the key tools in qualitative research is triangulation, i.e. the use of various data sources, research methods and perspectives to obtain a more complete picture of the examined reality. Triangulation allows you to increase the reliability of results by comparing different data and looking at the research problem from different perspectives. For example, a researcher examining organizational culture may formulate the hypothesis that „A high level of team cooperation increases work efficiency." To verify this hypothesis, the researcher can interview employees, observe their behavior and analyze company documents. The results of these different methods can be compared to obtain a coherent picture of the examined

reality. Research hypotheses are an indispensable element of every research process, because they allow the formulation of assumptions regarding the studied phenomena, which can then be verified on the basis of the collected data. In quantitative research, hypothesis testing is carried out using statistical methods such as Student's t-tests, regression analysis or analysis of variance, which allows for objective confirmation or rejection of the assumptions made. In qualitative research, however, hypotheses are verified in a more flexible way, using tools such as triangulation. Regardless of methodology, hypotheses play a key role in the structure of research, helping researchers draw conclusions and understand the phenomena being studied. Hypothesis verification involves not only confirming assumptions, but also modifying them in the light of new data, which allows for a more holistic approach to scientific research.

3.1 Research cases, experiments, case studies choosing appropriate formats

Research design, especially in the context of protection of people and property, requires a well-thought-out and organized research architecture. This architecture is the foundation on which the entire study is based, from conceptualization, through

implementation, to the analysis of results. To achieve the intended research goals, it is necessary to use appropriate design strategies that allow for obtaining reliable and valid results. Research design strategies are crucial to proper study implementation. First of all, you should focus on conceptualization, i.e. creating a clear vision of what what will be tested and how. At this stage, it is important to define the research problem that the study is intended to solve. In the case of protecting people and property, the problem may be, for example, analyzing the effectiveness of video monitoring systems or assessing the actions of security guards in threat situations. Conceptualization also involves defining the research objectives that will guide the next steps. After defining the research problem, you should move on to the research design stage, i.e. selecting appropriate research methods and tools. It is crucial that the methods used are adequate to the nature of the problem. For example,

In research related to the protection of people and property, it is common practice to conduct field experiments that enable simulation of threat situations and assessment of the effectiveness of protective measures. Depending on the specifics

of the problem, other methods can also be used, such as case studies, interviews or surveys. The next step is planning and scheduling the research. Planning includes the selection of the research group, i.e. the people who will be the study participants. In the case of protection of persons and property, this group may include security personnel,

operators of video monitoring systems or persons responsible for security management in public institutions. Research scheduling involves setting specific dates and stages of research implementation. It is important that the schedule is realistic and takes into account all key elements of the study, such as data collection, analysis of results or preparation of a final report. In the context of protecting people and property, an important element of research design is also the selection of appropriate research tools. These tools may include both qualitative and quantitative techniques. For example, in studies on the effectiveness of monitoring systems, statistical analysis of data collected from video surveillance cameras can be used. In research on the actions of security guards in crisis situations, observational techniques can be used to assess their reactions and decisions in real time. The next step is to choose the

appropriate test format. Depending on the nature of the research problem, you may decide to conduct an experiment, a case study or a survey. Experiments are particularly useful in situations where we want to examine specific reactions of security guards to simulated threat situations. Case study, in turn, allows for an in-depth analysis of a specific situation, such as a security incident in a given institution. Surveys may be useful to examine security employees" opinions on the effectiveness of the security measures used. After selecting the research format, proceed to the implementation stage, that is, the actual conduct of the study. At this stage, it is crucial to strictly adhere to the research assumptions and schedule. It is also important to monitor the progress of the study and solve any problems on an ongoing basis. In the case of research related to the protection of persons and property, An important element of implementation may be, for example, simulating threat situations, such as an attempted burglary or a terrorist act, and assessing the reaction of security guards in such situations. When the study is completed, the results analysis stage begins. This analysis includes both qualitative and quantitative analysis. Depending on the research methods used, the analysis may include, for example, statistical

analysis of data collected from video surveillance systems or analysis of security guards" statements about their experiences and opinions on the effectiveness of security measures. The results of the analysis are then presented in the form of a report, which contains conclusions and recommendations for further actions.

The final step in the research design process is to implement the research conclusions in practice. In the case of research related to the protection of persons and property, the implementation of conclusions may include, for example, the introduction of new security procedures, changing the organization of work of security guards or modernizing video monitoring systems. It is important that the implementation of the proposals is preceded by a thorough analysis and consultations with security experts. Designing research in the context of protecting people and property is a complex process that requires an appropriate strategy, research tools and formats. It is crucial that the study is well planned and implemented, which will allow obtaining reliable results and conclusions that can then be used to improve the effectiveness of protection and security measures. To continue the topic of research design, especially in the context

of protecting people and property, it is worth taking an even deeper look at specific elements of the study that are crucial at each stage of the process. The first is the context of the study. Before starting any form of design, it is extremely important to understand in what environment the study will be conducted and what its limitations are. In the case of research on the protection of persons and property, this context may include various aspects, such as the specificity of the place (e.g. public buildings, shops, shopping malls), types of threats (theft, burglary, acts of vandalism), as well as applicable legal regulations and ethical standards, that may affect the conduct of the study. In security research, it is also important to understand the technologies that can be used to monitor and protect people and property. These technologies may include video surveillance systems, alarm systems, biometric technologies and even artificial intelligence, which is increasingly used to analyze data collected by monitoring systems. It is worth considering how these technologies can be used in research and what their limitations are. For example, video surveillance systems can provide large amounts of data, but analyzing this data may require advanced algorithms. that

are able to capture key events in real time. Choosing the right data collection tools is also crucial in research on the protection of people and property. Depending on the nature of the study, various data collection methods can be used, such as observations, interviews, surveys or analysis of data from monitoring systems. For example, if the aim of the study is to assess the effectiveness of security measures in crisis situations, it is worth using the participant observation method, which allows for direct observation of security guards" reactions during simulated threat situations. Alternatively, surveys or interviews with security personnel can be used to obtain their opinion on the effectiveness of security procedures.

Another important element of research design is data analysis, which should be adapted to the specificity of the research problem. In research on the protection of persons and property, data analysis can include both statistical and qualitative techniques. For example, in research on video surveillance systems, quantitative analysis can be used to identify how many incidents were captured by cameras and how many were successfully detected by system operators. Qualitative analysis, however, may include a detailed analysis of individual

incidents, such as attempted break-ins or acts of vandalism, and an assessment of how effectively security responded. It is also worth mentioning the role of ethics in research on the protection of people and property. Due to this, since these studies often concern issues related to privacy, such as video surveillance or the use of biometric technologies, it is important that the study complies with applicable legal regulations and ethical standards. For example, research on video surveillance must take into account personal data protection regulations, such as GDPR, as well as rules related to the privacy of people who are monitored. It is worth considering how these regulations may affect the design of the study, and what steps should be taken to ensure that the study complies with applicable standards.

.An important element of each study is also its validation and assessment of whether the results obtained are reliable and can be used in practice. In the context of the protection of persons and property, validation of results may include, for example, carrying out comparative tests to assess whether the solutions used actually improve the effectiveness of protection. For example, you can benchmark different video surveillance systems to assess which one is best at detecting security incidents

in real time. Alternatively, crisis simulations can be carried out to assess how effectively security will respond in various threat scenarios. To sum up, designing research in the context of the protection of people and property is a complex process that requires appropriate planning, the use of appropriate tools and research methods, as well as taking into account issues related to ethics and legal regulations. It is important so that the research is well thought out at every stage, from conceptualization, through implementation, to analysis of the results. Thanks to this, it will be possible to obtain reliable and reliable results that can be used to improve the effectiveness of protection measures and the safety of people and property. That is worth considering when designing a study is the issue of monitoring progress. Regularly checking that the study is proceeding as planned can help identify potential problems at an early stage. A well-planned system for monitoring the progress of the study allows for ongoing assessment, whether the schedule is being implemented as planned and whether any unforeseen difficulties arise. For example, if the study examines the effectiveness of video surveillance systems, monitoring may include regularly checking that all cameras are working

properly, whether data is recorded correctly and whether system operators perform their duties in accordance with the assumed plan.

If, as you monitor the progress of the study, it becomes clear that certain elements are not going according to plan, changes to the study design may be necessary. These changes may include, for example, a modification of the schedule, changing data collection methods or even changing the survey format. It is important for the researcher to be flexible and ready to make necessary changes if it turns out that the original research plan does not produce the expected results. For example, if during the investigation it turns out that the video surveillance system does not record all incidents, you may choose to use additional methods, such as interviews with security staff, to get a more complete picture of the situation. Another issue worth considering is risk analysis. In every study, there is a risk that certain elements may not go as planned. In research on the protection of persons and property, these risks may include, for example, equipment failures, problems with access to data, or difficulties in recruiting study participants. Therefore, it is worth preparing a risk management plan already at the audit planning

stage, which will allow for quick response in the event of unforeseen problems. For example, if there is a risk, that the video monitoring system may fail, it is worth considering the possibility of using alternative data collection methods, such as manual monitoring of the situation by security staff. It is also worth noting that not all data collected during the study will have the same value.

Therefore, an important element of research design is the selection of data that will be subjected to detailed analysis. For example, in research on video surveillance systems, it is worth focusing on data that relate to key security incidents, such as burglary attempts, acts of vandalism or other crisis situations. Other data, such as routine events, may be less important and do not need to be analyzed in detail. Finally, it is worth emphasizing once again the importance of communication in the research design process. Good communication between members of the research team as well as with study participants, is crucial to the success of the entire project. In the context of protecting people and property, communication may include, for example, regular meetings with security staff to discuss research progress, and meetings with management

representatives to present preliminary results and obtain feedback. It is important that communication is clear and understandable to all parties, which will avoid misunderstandings and ensure that the study proceeds as planned. In the context of protecting people and property, a well-designed study can provide valuable information on the effectiveness of the security measures in place, as well as indicate areas where which need improvement. Thanks to appropriately selected research methods, data collection tools and analysis of results, it is possible to obtain a more complete picture of the situation and introduce changes that will contribute to improving the safety of people and property.

Continuing the topic of research design, especially in the area of protection of people and property, the important role of evaluation in the entire process cannot be ignored. Evaluation is one of the key stages that allows you to assess the effectiveness of the research conducted and, consequently, the effectiveness of the implemented solutions. It is worth considering several important aspects of this phase. Firstly, evaluation concerns not only the results of the study, but also the research process itself. At this stage, it is important to consider whether the methods

and tools used were appropriate or whether there were difficulties that could have been anticipated and responded to better. An example may be a situation in which a study on the effectiveness of video monitoring systems showed that that monitoring operators were overloaded with the amount of data to process, which resulted in some incidents being missed. An evaluation of such a study could suggest that a better solution would be to introduce advanced image analysis algorithms that would help reduce the burden on operators and automatically detect incidents.

.It is also worth noting that evaluation should be conducted in a systematic way and include various perspectives both of the researcher, of people who participated in the study, and of those who will use the results. In the case of research on the protection of people and property, the perspective of security staff, facility managers, and users of protective systems is extremely valuable. Research that focuses only on one perspective may miss important issues that may be crucial from the point of view of other stakeholders. For example, management may only be interested in financial indicators, while security staff may highlight day-to-day operational difficulties that negatively

impact their performance. Another important element that is worth taking into account in the evaluation process is the transfer of research results into practice. This means that the test results themselves have no greater value, if they are not properly implemented and applied in reality. Therefore, it is important to consider from the beginning of the study how the data obtained can be used in practice. Can new security procedures be implemented in the daily activities of security guards? Do monitoring systems need modernization? What training will be needed to ensure that security staff are able to carry out their duties effectively? These are just some of the questions that should be asked at the evaluation stage.

It is also worth considering the role of training and education in the process of implementing the research results. When it comes to protecting people and property, regular training for security staff is essential to ensure they are up to date with new technologies and procedures. Research results can provide valuable information, that should be included in training programs. For example, if a study shows that security staff have difficulty responding quickly to incidents recorded by video surveillance systems, it is worth organizing training that focuses

on quick identification and analysis of threats. However, simply conducting training is not enough. It is extremely important to monitor the effects of these trainings and regularly assess whether they actually contribute to improving the effectiveness of protection. This can be done in various ways for example by conducting regular internal audits, testing protection systems or organizing simulations of crisis situations. The results of such tests can provide valuable information about whether security staff are able to effectively apply new procedures, as well as whether new technologies actually improve security. Regardless of the specificity of the study, One of the key elements of every research process is data analysis. The data that will be collected during the study may take various forms from numerical data, through qualitative data, to visual data, such as recordings from monitoring systems. The analysis of this data must be adapted to the nature of the research problem.

For example, in research on the effectiveness of security systems, data analysis may include an assessment of the number of registered incidents, the security response time to a threat, or the effectiveness of preventive measures. In qualitative research, such as interviews with security personnel, data analysis may

focus on identifying the most common problems, difficulties and proposed solutions. An important element of data analysis is also the verification of research hypotheses that were formulated at the research design stage. Hypothesis verification involves checking whether the obtained results confirm or refute the assumptions that were the basis of the study. For example, if the research hypothesis is that the introduction of advanced biometric technologies will increase the effectiveness of security in public buildings, data analysis should provide an answer to the question whether such a relationship actually exists. In the case of quantitative research, verification of hypotheses may involve the use of advanced statistical techniques, such as student t-tests, regression analysis or econometric modeling.

In the context of research on the protection of people and property, it is also worth considering the role of technology and innovation. Technology plays a key role in ensuring security, and research into new technologies can provide valuable information that will help improve the effectiveness of security systems. An example may be the development of advanced video monitoring systems, that use artificial intelligence to analyze images in real time. Such systems can automatically

identify potential threats, such as suspicious behavior by people, and immediately inform security staff about them. It is also worth mentioning biometric technology, which is increasingly used in access control systems. Research on the effectiveness of these technologies can provide valuable information about their advantages and disadvantages, as well as indicate in which situations they are most effective.

Another important aspect is the interoperability of security systems. In many cases, different protection systems, such as video surveillance, alarm systems, access control systems, operate independently of each other. However, to ensure full effectiveness of protection, it is crucial that these systems are integrated with each other and operate within one coherent platform. Research on system interoperability can provide valuable information on how different technologies can work together to provide better protection for people and property. For example, integration of video surveillance systems with access control systems can allow automatic tracking of people moving around the facility, which significantly increases the level of security.

It is also worth mentioning the role of big data in research on the protection of people and property. Monitoring and protection systems generate huge amounts of data that can be used to analyze trends and predict potential threats. For example, analysis of data collected from video surveillance systems can help identify areas which are most vulnerable to security incidents, such as theft or vandalism. The use of advanced analytical tools such as machine learning algorithms can allow incidents to be predicted based on previous data, enabling proactive preventive actions.

The use of big data in research on the protection of people and property opens up new opportunities, but at the same time poses new challenges for researchers. One of these challenges is the issue of privacy protection. Much of the data collected by monitoring systems, especially vision and biometric systems, may contain sensitive information, which are subject to legal protection. Research into the protection of people and property must take into account personal data protection regulations, such as GDPR, and ensure that the collected data is adequately protected against unauthorized access.

Designing and implementing research in the area of protection of people and property is a complex process, which requires a multi-faceted approach, taking into account both technical, organizational and ethical issues. For this research to produce meaningful and useful results, it is necessary to strictly follow the research methodology, regularly monitor progress, as well as readiness to adapt and introduce changes during the research project. Evaluation of results and transfer of knowledge to practice are crucial for the success of each research, and the use of innovative technologies and approaches, such as big data or system interoperability, can significantly increase the level of protection and safety in various areas of social life.

3.3 Designing bachelor's, master's and doctoral research papers

Designing a scientific work, regardless of the academic level, whether bachelor's, master's or doctoral, is a process that requires not only substantive knowledge, but also organizational and technical skills. Each of these works differs in scope, but it has common elements, such as the choice of structure, writing in accordance with formal and stylistic rules, editing the text and preparing the presentation of results. All these elements must be

refined so that the work is coherent, understandable and, above all, consistent with academic requirements. I will discuss these issues below, paying attention to details that are important at each stage. The first step, regardless of the type of work, is to choose a work structure. Structure is a framework that gives scientific work order and a logical flow of information. There are several approaches to structuring work, which may vary by discipline, but in most cases they include similar elements: introduction, literature review, theoretical part, methodology, analysis of results, discussion and conclusions. The choice of the appropriate approach depends on the research goals and the specificity of a given topic. For example, in a bachelor's thesis the structure may be more simplified, consisting of a general introduction, a literature review, a short methodology and an analysis of the results. However, master's and doctoral theses require more complex structures, where each section should be developed and discussed in depth. It is also worth paying attention to specific departmental guidelines, which may indicate preferred forms of work structuring. The right choice of structure is the key to making the work clear and well-organized, which makes it easier to write and read. Another

aspect is writing concisely and precisely. The writing style in scientific papers is different from other forms of expression. It requires a formal tone, avoiding unnecessary decorations and focusing on providing information in a clear and factual manner. Each sentence should be intended to introduce new content or develop an idea presented earlier. Long, complex sentences can be confusing, so it is better to formulate shorter sentences, which are more understandable. Formal rules, such as avoiding personal forms (e.g. „I believe", „I think"), are important because scientific work is supposed to be based on objective analysis and argumentation, and not on the author's subjective opinions. Stylistically, you should be careful not to repeat the same words or sentence structures, which gives the text monotony. The use of synonyms and various grammatical structures helps maintain the dynamics of the statement without deviating from the main idea. Text editing is a key stage in the process of writing a scientific paper, which is often omitted or treated superficially. In fact, this is one of the most important steps, because even the best-conducted research will fail to impress if it is described in a vague or incorrect manner. Editing involves not only correcting spelling or grammatical errors, but also working on

the style, logic of expression and coherence of the text. Common mistakes that often appear in scientific works are incorrect use of terminology, too complex sentences, lack of clear cause and effect relationships and inappropriate references to literature. An important element of editing is also checking whether all chapters are logically related to each other, whether each of them brings something new to the whole work and whether the conclusions result directly from the presented analysis. When editing the text, it is also worth paying attention to the correct citation of sources, which is important in the context of avoiding plagiarism.

Preparing the presentation of results is another element of scientific work, which requires an appropriate approach. Depending on the discipline, research results may be presented in descriptive, tabular, chart or visual form. A good presentation of the results is crucial because it is on their basis that the reader judges whether the author's conclusions are correct. In the case of empirical research, results are often presented in tables or charts, making complex data easier to understand. It is important that tables and charts are legible, properly signed and placed in the text in a manner consistent with the content. Good

visualizations should be simple, but at the same time detailed enough to reflect the entire analysis. Too much information in one chart may discourage the reader, so it is better to divide the data into smaller parts that will be more accessible. It is also important not to base the entire presentation of results only on visualizations they must be accompanied by a comment that explains what they represent and what conclusions follow from them. It is also worth mentioning the technical aspects of writing a scientific paper, which include formatting, citation and organization of footnotes. Depending on the university's requirements, research papers must comply with specific formatting standards, such as APA, Chicago, Harvard or MLA style. Each of these styles has its own guidelines for formatting notes, bibliography, and text organization. It is important to familiarize yourself with the format requirements before you start writing to avoid having to revise your entire work later.

The organization of footnotes and references to literature must also be carefully considered care should be taken to ensure that all sources are correctly cited and written in accordance with style requirements. It is also worth using bibliography management tools, such as EndNote or Zotero, which facilitate

the organization of footnotes and prevent citation errors. In the context of presenting the results, attention should also be paid to the appropriate selection of data. Sometimes, especially in the case of doctoral theses, the amount of data collected can be overwhelming. The author's key task is to select the information that is most relevant to answering the research questions. A common mistake is to include too much data that is not directly related to the topic of the work. The presentation of results should be closely related to the purpose of the research avoid introducing elements that may distract from the main topic. It is also worth taking care of so that the presented results are consistent with the methodology each of the results obtained should be justified by the research conducted.

Finally, it is worth emphasizing that writing a scientific paper is an iterative process. It should be taken into account that work on the text will not end with one approach. After writing the first version, it is worth putting the text aside for a few days and then coming back to it with a „fresh" look. Often, a few days after writing, it is easier to notice errors, ambiguities or elements that require refinement. It is also worth consulting with supervisors or colleagues who can provide new, constructive comments.

Especially in the case of a doctoral thesis, consultations with more experienced researchers may prove invaluable. Writing a scientific paper requires both organizational and technical skills. Choosing the appropriate work structure, applying formal and stylistic rules, editing the text and preparing an appropriate presentation of the results are key elements that determine the quality of the final work. Each of these elements requires attention and care, but combining them into a coherent whole allows you to create a work that will meet academic requirements and gain recognition in the eyes of reviewers. Writing a scientific paper is a multi-stage process that requires focus and precision, as well as the ability to adapt to specific academic standards. After discussing the choice of the structure of the work, the rules of writing and editing the text, it is worth taking a look at other aspects of this process.

One of them is the ability to conduct an in-depth analysis of the literature on the subject, which is the foundation of every scientific work. The literature review is not only an introductory part to the topic, but also a key element that allows the author to understand current research in a given area and find niches, which can be developed later in the work. An important step is

the selection of appropriate literature sources. You should rely on trusted and up-to-date sources, such as scientific articles from peer-reviewed journals, specialized books, research reports and theoretical studies. It is worth avoiding unreliable sources, that may introduce incorrect information or do not meet academic standards. You should also remember to cite sources appropriately, in accordance with the guidelines of a given citation style. Incorrect citation may lead to accusations of plagiarism, which is one of the most serious charges that can be brought against the author of a scientific work. When analyzing literature, a critical approach to the presented content is also important. The author should assess whether the research is reliable, what methods were used and whether their results are reliable. Critical analysis of literature allows not only to better understand a given issue, but also to draw your own conclusions, which will constitute the basis for further work. This is also the moment when you can notice gaps in the literature and plan how your own research can fill them. It is important that the literature review is not only a summary of existing research, but also includes the author's reflections on their importance and their impact on the further development

of the topic. Once the literature review is ready, the next step is to develop a research methodology. Methodology is one of the most important elements of scientific work, because it is the basis for all subsequent analyzes and conclusions.

The choice of appropriate research methods should be closely related to the purpose of the work and the research questions. Methods can be both qualitative and quantitative, and sometimes scientific work requires a mixed approach, combining both approaches. In the case of quantitative research, the most commonly used techniques are surveys, experiments or analysis of statistical data. In turn, qualitative research includes interviews, observations and case studies. Each method has its advantages and disadvantages, so it is important for the author to clearly understand what research tools will be most suitable for achieving research goals. When describing the methodology, it is crucial to show exactly how the research was conducted. Please describe in detail what data was collected, how and under what conditions. This not only increases the credibility of the work, but also allows other researchers to repeat the experiment or use similar methods in their research. Transparency in describing the methodology is extremely important because it

makes it possible to assess the correctness of the research techniques used and the reliability of the results obtained. The next step is to analyze the results. This is the moment when the author presents what has been researched, what data has been collected and what results from it. In the case of quantitative research, statistical methods are often used to interpret data, which allows drawing conclusions about relationships between variables. However, in qualitative research, the results are usually more descriptive, but it is equally important that they are presented in an orderly and clear way. It is important so that the results are related to the research questions that the author was trying to answer. You should avoid entering data that is not directly related to the topic of your work, as it may distract from the main conclusions. When presenting research results, it is worth paying attention to appropriate visualizations, such as tables, charts, diagrams or diagrams. Visualizations can make complex data much easier to understand and make work more accessible. However, it is important that each visualization is legible and properly described. The reader should be able to understand what a given chart or table shows, without having to guess or look for additional explanations. You should also

remember to properly arrange visualizations in the text so that they are an integral part of the work and not just an addition. The last part of the scientific work are the conclusions. This is the moment when the author summarizes his research and presents what answers were obtained to the research questions. Conclusions should be closely related to research results and based on a reliable analysis of the collected data. Conclusions that are not supported by the results should be avoided as they may undermine the credibility of the overall work. It is also worth referring to the literature on the subject and showing how research results fit into the current state of knowledge in a given field. Conclusions are also a place for reflection on the limitations of the study and suggestions for further research. You should be aware that each study has its limitations, e.g. due to time, financial or methodological constraints. It is important so that the author can notice them and write about them honestly, which increases the transparency of the work and allows other researchers to take these limitations into account in their future research. After finishing writing your scientific paper, it is worth carrying out several rounds of editing and proofreading.

First of all, you should focus on the coherence and logic of the argument, checking whether all parts of the work are logically related to each other and whether the whole creates a coherent argument. Then, it is worth paying attention to the style and linguistic correctness, avoiding repetitions, ensuring appropriate terminology and grammatical and spelling correctness. At last, it is also worth asking someone to read your work and provide constructive comments. Sometimes a fresh look allows you to notice things that the author missed. Finally, it is worth emphasizing that writing a scientific paper is a process that requires patience and commitment. It's not just a test of research skills, but also the ability to draw conclusions, think logically and convey information clearly. Each stage, from selecting a topic, through literature analysis, to presenting the results, requires attention and care. A well-written scientific work not only meets formal requirements, but also brings value to a given area of knowledge, contributing to its further development.

The key to success in writing a scientific paper lies in proper organization, systematicity and attention to detail. The author must be both a researcher and a writer, as well as a critic of his or her own work. Each of these roles requires a different set

of skills, but all are necessary to create a job, which will not only meet the expectations of reviewers, but will also become a valuable contribution to the field of science in which it was written. Continuing the topic of writing a scientific paper, it is worth paying attention to important aspects that are often omitted but have a key impact on the final result. Above all, a scientific work is not only a collection of facts and research results, but also a scientific story that must be clearly presented, with an appropriate logic of argumentation and a narrative that leads the reader through the individual stages of considerations. To achieve this, the author must understand that every scientific work, regardless of level (be it bachelor's, master's or doctoral thesis) must be consistent both in terms of content and structure. One of the key challenges in writing a scientific paper is maintaining a balance between originality and reference to the literature on the subject. Scientific work is based on what has already been researched and published, but its purpose is to introduce something new to existing knowledge. That is why it is so important that the author is able to indicate how his research contributes to the development of the field in which he

works. Achieving this goal requires a skillful combination of the literature review with your own conclusions and results.

The literature review should constitute a solid basis on which the author can base his arguments, but at the same time it cannot be the only content of the work. It is important to clearly indicate at what point the analysis of previous research ends and the author's original contribution begins. In this matter, it may be helpful to use the so-called „research gap", i.e. an area that has not yet been fully researched or in which there is a contradiction between different studies. Identifying such a gap allows you to indicate how the author's research adds new value. This not only helps in precisely formulating research goals, but also makes that the work is more original and innovative. It is important, however, not to stop at just pointing out the gap you should also clearly present how the author intends to fill it and what specific methods and research tools will be used for this purpose.

An equally important aspect is the ability to formulate clear and precise research questions. Research questions are the backbone of any scientific work because they give direction to the entire research. Well-formulated research questions must be clear and

measurable this means that the author must be able to answer them in a specific way, based on collected data. A common mistake of novice researchers is formulating too general or too broad questions that are difficult to solve in one scientific work. It is important that the questions are realistic and that their solution is achievable within the chosen methodology. In addition to the research questions, An important element of every scientific work is a hypothesis. A hypothesis is an assumption that the author makes at the beginning of the study and which he intends to verify on the basis of the collected data. Unlike research questions, which may be more open-ended, a hypothesis is specific and constitutes a guess as to the answer to the questions posed. For example, if the purpose of the study is to test whether there is a relationship between variables X and Y, the hypothesis might be: „I assume that variable X has a positive effect on variable Y." The hypothesis is therefore a form of predicting the result of the study and constitutes a reference point for further analysis of the results. When formulating a hypothesis, it is important for it to be falsifiable, which means that it must be possible to disprove it based on the results of the study. In other words, a hypothesis cannot be

formulated in such a way that its truth cannot be verified. If the hypothesis is correct, the results of the study should confirm it, but they may well disprove it. The author must be open to both scenarios and prepared to present the results whether they support the hypothesis or not. The previously mentioned research questions and hypothesis are crucial in the context of research methodology. As I have already mentioned, the selection of appropriate research methods depends largely on what questions the author asks and what hypotheses he formulates. If the goal is to verify the relationship between variables, quantitative methods such as statistical analysis are most often used. In turn, in qualitative research, where the goal is a deeper understanding of certain phenomena, methods such as interviews, document analyzes and observations are used. When choosing research methods, the author should also take into account the availability of data and resources at his or her disposal. A common mistake is the selection of complex research methods, the implementation of which requires significant time, money or other resources that the author does not have. That's why it's worth it to realistically assess your capabilities at the research planning stage and select methods that are feasible

in a given time and with available resources. After conducting the research, the key element is the analysis of the results. Analysis is the process in which the author interprets the collected data and draws conclusions from them. In the case of quantitative research, the analysis is usually based on statistics and tests that allow verification of the hypothesis. It is important that the author is able not only to perform correct calculations, but also to understand what they mean and how they affect the answers to the research questions. In qualitative research, the analysis of results is more subjective and based on the interpretation of the collected data. For example, an author might analyze interview transcripts, looking for common themes that emerge in respondents" responses. It is important that this analysis is systematic and based on specific criteria, and not on random observations. It is also worth paying attention to the diversity of data sources and trying to ensure that the conclusions are based on different perspectives, which increases their credibility. The ultimate goal of analyzing the results is to formulate conclusions that are consistent with the data collected. As I mentioned earlier, conclusions must be directly related to the results of the study and cannot be the result

of speculation. It is important that the author is able to clearly present what answers he obtained to his research questions and whether the hypothesis was confirmed or disproved. It is equally important to present the implications of these conclusions what they mean for a given field of science and what applications they may have in practice.

Often in scientific papers there is a section devoted to the limitations of the study. The author should be aware that no study is perfect and each has its limitations, resulting from the methods used, available data or other external factors. It is important to clearly point out these limitations and explain how they may affect the results of the study. Such reflection shows that the author has a realistic approach to his research and understands that the conclusions are not absolute, but have certain limitations. Another important element of scientific work are practical conclusions. Depending on the topic, scientific work may have specific practical implications that can be used in a given field. For example, if the research concerns management, the results may be directly applicable to companies or institutions. The author should clearly present what specific benefits result from his research and how they can

be used in practice. The entire process of writing a scientific paper should be emphasized that the key element is proper organization and planning. Writing a thesis is a process that requires time and patience, but well-planned work stages allow for the systematic achievement of subsequent goals. It is important to pay attention to detail at every stage, both in terms of content and form. The author must be a critical researcher, but also a good writer who can convey his conclusions in a clear and understandable way for the reader. Only then does scientific work fulfill its goals, both scientifically and practically. It is also worth remembering that every scientific work, regardless of its level, is an important step in the author's scientific development. It is not only a chance to obtain a scientific degree, but also an opportunity to develop research skills, analytical and writing skills that will be useful in your further scientific and professional career. Continuing the considerations on writing a scientific paper, it is worth focusing on some detailed aspects that may not be obvious at first glance, but are of key importance for the final quality of the work. At this stage of advanced analysis, it is extremely important to skillfully balance between the accessibility of the content and its depth. On the one hand,

a scientific work must be written in a clear and understandable way for the recipient, who does not always have to be an expert in a given field, and on the other hand, it must be sufficiently comprehensive, for it to be perceived as a solid scientific study. One of the most important elements of scientific work, especially at the master's and doctoral levels, is critical thinking. Although there is a lot of talk about critical thinking, its application in practice is not easy. The author of a scientific work should be able to clearly separate facts from opinions, analyze information presented, consider alternative viewpoints, and question assumptions. It is crucial that he is able to look at the research topic not only from one perspective, but from different points of view, which allows for a better understanding of the complexity of the problem and contributes to drawing more comprehensive conclusions. One of the tools that support critical thinking is SWOT analysis, i.e. identification of strengths and weaknesses, as well as opportunities and threats related to a given issue. SWOT analysis is widely used in many fields of science, as well as in business and management. It can be helpful both at the stage of formulating research questions, as well as when analyzing the results. It allows for a more complete

understanding of the examined reality because it forces the author to look at the problem from different sides. Strengths and weaknesses may refer to internal aspects of the research problem, while opportunities and threats may refer to external factors that may influence the study. Another important element of scientific work is the clarity and transparency of argumentation. Scientific work, regardless of its level, should be constructed in such a way that each subsequent chapter results from the previous one, and the whole is coherent and logical. It happens that authors forget that the reader does not have as much knowledge about the topic as they do, that is why it is so important not to assume too high a level of advancement in the recipient. Each new concept, each new theory or methodology, should be properly introduced, explained and clarified before the author moves on to more detailed analysis. This is especially important for a doctoral thesis, where the topics are often very specialized and require introducing the reader to more advanced terminology. However, writing in an understandable and clear way does not mean simplifying the content. The key is to find a happy medium between accessibility and complexity.

The author should demonstrate the ability to explain complex concepts in an understandable way, without losing sight of the scientific nature of the work. This is a difficult art, but necessary if the work is to be recognized as a valuable contribution to the field of science. Another important element of scientific work is its precise citation and references to the literature on the subject. Citation is the foundation of scientific work because it shows what sources the author relies on, what research has been previously conducted in a given field and how one's own research fits into the existing scientific discourse. It is important to cite sources accurately and consistently, following the guidelines set by the citation style adopted by the university or institution. Whether we use APA, MLA, Chicago, or another style, we must ensure that citations are uniform and follow the guidelines. It is also worth remembering that citation is not only a tribute to other researchers, but also a way to avoid accusations of plagiarism, which is an extremely serious issue in the academic environment. Citations serve another important function they show that the author is aware of existing research in a given area and can skillfully refer to existing knowledge.

This is especially important in the case of master's and doctoral theses, where an in-depth analysis of the subject literature is required. The author must demonstrate the ability to think critically and evaluate the research of other authors, and not just passively quote them. Quotations should be included in the narrative of the work in a natural and logical way, so that they constitute an integral part of the argument and not just an addition to the argument. In the context of citations, it is also worth mentioning paraphrasing. Paraphrasing is the ability to convey someone else's thoughts in your own words, which allows you to avoid excessive quoting of literal fragments of the text. However, paraphrasing is more difficult, than you might think, because it requires understanding the content and the ability to present it in a way that reflects the meaning of the original, but at the same time is written in your own words. It is important to always indicate the source we are using when paraphrasing to avoid plagiarism. An equally important element of scientific work is the way how the author deals with empirical data. In the case of quantitative research, correct statistical analysis is extremely important, which allows for the verification of hypotheses and answers to the research questions.

In qualitative research, the author must demonstrate the ability to interpret data in a systematic and reliable manner. Regardless of the type of data, the author must strive to present the results in an understandable and transparent manner so that the reader can easily understand what conclusions have been drawn from the study.

Presenting research results in a visual form through charts, tables, diagrams is very helpful, especially for more complex data. It is important that such visualizations are legible and properly described. Each graph or table should be carefully explained in the text so that the reader knows what they represent and what conclusions can be drawn from them. Avoiding excess information in one chart or table is crucial, because overly complicated data presentations can cause confusion and make the work more difficult to understand. When preparing research results, you should also remember to formulate the conclusions appropriately. Conclusions must be clearly linked to results, and not merely general statements. It is important that the author is able to answer research questions based on the collected data, and not on the basis of his or her own thoughts or speculations. Conclusions must be based on facts

and closely related to the research conducted. Finally, in the case of scientific work, It is also worth remembering to edit and proofread the text. Regardless of how well we have written our work, it is always worth spending time to review it thoroughly, correct any errors, both linguistic and substantive, and make sure that the whole thing is coherent and logical. Editing is not only about correcting typos or punctuation, but also about working on the style, clarity and clarity of the text. It is worth asking someone to read your work, because an outsider may notice errors that we did not notice ourselves. Writing a scientific paper is a complicated process, which requires skills in many different areas, from critical thinking, through data analysis, to correct quoting and editing. The key to success is proper work organization, systematicity and attention to detail. The author must be both a researcher and a writer, as well as a critic of his own results. Scientific work is not only about meeting academic requirements, but also an opportunity to develop your research and analytical skills, which will be important in your future scientific or professional career. Finally, it is worth emphasizing once again that every scientific work, regardless of its level, constitutes a contribution to the development of a given field

of knowledge. It is not only a collection of data and results, but also a testimony to the author's skills in conducting research, analyzing and presenting results. A well-written scientific work is a valuable contribution to the development of science, as well as proof that the author is able to think critically, formulate conclusions based on data and present them in a clear and understandable way.

4.1 The impact of technology on future Research

Innovation and the future of scientific research are inextricably linked to the dynamic development of technology, which is already revolutionizing the way we conduct and understand the research process. In the coming decades, the impact of technology on future research will become even more visible as new tools, such as Big Data, Artificial Intelligence (AI) and interdisciplinary research approaches will become more important. As a result, traditional research methods will be complemented by modern technological solutions, which will bring both new challenges and unprecedented opportunities. The impact of technology on future research cannot be overstated. Not only the tools that researchers use on a daily basis are changing before our eyes, but also the way we perceive

scientific research. Technologies such as artificial intelligence, machine learning and Big Data open up completely new perspectives. In the case of Big Data, we are dealing with huge amounts of data that can be used to analyze phenomena in a way that was not possible before. In the past, research was based on a limited sample of data, which often led to conclusions with a certain margin of error. Today, thanks to Big Data, we can work on complete data sets, analyzing them in real time, which allows us to obtain more precise results.

Artificial intelligence and machine learning have introduced another revolution in scientific research. The future of research rests on the ability to analyze huge amounts of data in an automated way, which allows you to identify patterns that a human would not be able to see. AI not only helps in data analysis, but also in formulating new research hypotheses, which significantly speeds up the entire research process. It can even be said that AI is becoming one of the main tools supporting innovation in science. The use of AI in scientific research also contributes to the optimization of research processes. Traditionally, scientists have had to spend enormous amounts of time reviewing scientific literature, analyzing data, and

formulating hypotheses. Today, these tasks can be partially or even completely automated. Thanks to machine learning algorithms, we can predict research results before they are completed, which allows for better planning and allocation of research resources. However, with the growing role of AI in research, new challenges also arise. One of them is the need to develop algorithms, that will be able to operate in a transparent and understandable way for people. There is a risk that overly complex AI systems may lead to a situation in which scientists will not be able to fully understand how certain conclusions were formulated. Transparency in scientific research has always been crucial, and in the era of AI this becomes even more important. In addition, ethics in AI-based research is an important aspect. Questions about responsibility for the results of research in which artificial intelligence played a key role are increasingly being raised. Are they scientists Should algorithm creators be responsible for potential errors and their consequences? Another area where technology will impact future research is the development of research methods based on neural networks and computer simulations. Simulations that were once limited by computer processing power now they are

becoming more and more advanced thanks to supercomputers and quantum technologies. These simulations allow you to conduct experiments in a virtual environment, which is invaluable in fields such as medicine, physics, chemistry and astrophysics. Thanks to them, it is possible to test various scenarios and theoretical models, leading to faster progress in scientific research. For example, in medicine, computer simulations allow new therapies and drugs to be tested on virtual patient models, which speeds up the process of bringing them to market. Interdisciplinarity of research is another important element of the future of science. The traditional division into research fields is slowly losing importance. Nowadays, more and more research is based on the cooperation of scientists from various fields. Biology, computer science, engineering, medicine, and even social sciences are increasingly joining forces to solve the most pressing problems in the modern world. An example of such cooperation is the development of personalized medicine, which combines the achievements of genetics, molecular biology, computer science and statistics to adapt therapies to the individual needs of patients. This

approach opens up new possibilities, but also requires new research methodologies and data analysis tools.

The future of research also brings new challenges related to the management and storage of huge amounts of data. Big Data, which plays an increasingly important role in scientific research, poses new questions for researchers regarding data storage, analysis and protection. How to ensure that the data will be available to future generations of scientists? How to protect research data from unauthorized access, especially in the context of medical research where privacy issues are key? The development of technology brings many opportunities, but also requires new regulations and standards. One of the key challenges researchers face is there is also the issue of ethics in interdisciplinary research. When scientists from different fields join forces, there is a risk that the ethical standards of one field may not be consistent with the others. For example, in medical research, ethics plays a key role in protecting patients" rights, whereas in computing such rules may not be as strictly followed. Therefore, interdisciplinary research teams must place great emphasis on creating common ethical standards that will be respected by all participants in the

research project. quantum technologies, already mentioned in the context of computer simulations, open completely new perspectives in scientific research. Quantum computers, which can process data unimaginably fast compared to traditional computers, could become a key tool in the study of complex phenomena. Thanks to them, it will be possible to solve problems that have so far been beyond the reach of science. In the field of chemistry, for example, quantum computers can speed up the process of discovering new materials, which in turn could have a huge impact on the development of renewable energy technologies. In astrophysics, they can help analyze data from telescopes, which will allow for a better understanding of space. The future of scientific research is inextricably linked to the development of technology. Big Data, artificial intelligence, machine learning, computer simulations, interdisciplinarity and quantum technologies are just some of the tools that will shape research in the coming years. However, scientists also face numerous challenges, such as the need to create transparent algorithms, managing huge amounts of data, and the issue of ethics in interdisciplinary research. Technology not only changes the way we conduct research, but

also opens up completely new perspectives, that were previously beyond the reach of human imagination. Over time, science will become even more integrated with technology, allowing for further progress and the discovery of new areas of knowledge. The development of technology in scientific research poses not only new opportunities for researchers, but also challenges that must be overcome, to maximize the potential of innovation. One of the key aspects of the future of research is the issue of technology availability and equal opportunities for scientists from different regions of the world. We must not forget that in many developing countries access to modern research tools, such as supercomputers, advanced laboratories or artificial intelligence, is still limited. This leads to disparities in research and may hinder scientific progress on a global scale. In this situation, it becomes crucial to introduce initiatives that aim to balance access to research technologies. One of such solutions is international cooperation and the creation of research platforms that enable scientists from around the world to share resources. An example is the development of open databases to which all researchers have access, regardless of geographical location. Projects such as the Human Genome Project, that

involve scientists from different countries, show that international cooperation can lead to breakthrough discoveries that would not be possible in isolation.

Another important aspect of the future of research is the growing role of citizen science. With the development of technology, especially in the field of communication, more and more people from outside the academic community are getting involved in research projects. Thanks to online platforms, mobile applications and social media, citizens can actively participate in scientific research by collecting data, analyzing results and monitoring the natural environment. An example is the Galaxy Zoo project, which involves thousands of volunteers in classifying galaxies based on images from telescopes. Such projects not only speed up the data collection process, but also contribute to the popularization of science and building greater understanding of research in society. Technology also opens new opportunities for popularizing scientific research results. In the digital age, access to scientific information is much easier, changing the way scientists share their discoveries. Traditional scientific journals, which were often available only to a narrow group of specialists, are giving way to open access platforms.

Thanks to this, research results become available to everyone, which contributes to their wider use. This is especially important in fields such as medicine, where quick access to new discoveries can save lives. However, it is worth noting that the dissemination of research results also requires responsibility on the part of scientists and the media to ensure that information is presented in a reliable and factual manner. In the context of interdisciplinarity, the future of scientific research will become increasingly complex, which poses new challenges for scientists. The traditional model of research work, in which scientists specialize in one narrow field, may turn out to be insufficient in the face of society's growing needs. Complex problems such as climate change, health crises or an aging population require a holistic approach, combining knowledge from various fields. Scientists must be prepared for the fact that their research will require cooperation with experts from other fields, which in turn requires developing communication and teamwork skills. However, interdisciplinarity is not only an opportunity, but also a challenge. Scientists need to find a way to combine different research methodologies, which can often be contradictory. For example, quantitative methods used in the

sciences may not always be appropriate in social science research, where qualitative methods often dominate. That is why it is so important to develop new research tools that will enable the integration of various approaches.

One example is the so-called mixed methods, which combine quantitative and qualitative research, which allows for more comprehensive results. The role of ethics in future scientific research cannot be ignored. As technology develops, new ethical questions arise that must be addressed at every stage of the research process. In medical research, the key issue is the protection of patients" privacy and consent to participate in research. Research based on artificial intelligence and Big Data raises the question of how data is collected, stored and used. Scientists must be aware of the potential risks associated with the use of new technologies to ensure that research is conducted in accordance with the highest ethical standards. Another important aspect of the future of scientific research is the growing need for openness and transparency in the research process. In times of global crises, such as the COVID-19 pandemic, there is an increasing emphasis on the rapid sharing of research results to accelerate scientific progress. However,

openness in science is not only a matter of sharing research results, but also transparency in terms of financing, methodology and research data. There are increasing initiatives to ensure that research data is available to all interested parties, which will contribute to increasing the reliability and reproducibility of research. One of the challenges related to open research is also the need to protect intellectual property. Scientists often face the dilemma of how to reconcile the openness of research with the need to secure the rights to their own discoveries. In this context, patents and licenses play an important role as they allow scientists to protect their innovations while enabling their wide use. It is important to strike the right balance between openness and the protection of intellectual property rights, so that research can contribute to scientific progress while protecting the interests of its creators. Technologies such as blockchain can play a key role in ensuring transparency and intellectual property protection in future scientific research. Blockchain, as a decentralized and transparent technology, can be used to track and verify research data, which prevents its falsification. Thanks to this, researchers can be sure that their discoveries are protected and at the same

time available to other scientists in a transparent and secure way. Another innovation that will change the future of scientific research is the so-called virtual labs. In the era of globalization and the pandemic that forced scientists to work remotely, virtual laboratories are becoming more and more popular. They enable experiments and simulations to be conducted in a virtual environment, which eliminates the need for physical presence in the laboratory. Thanks to virtual laboratories, scientists can cooperate with researchers from all over the world and conduct large-scale experiments, that would be impossible under traditional conditions.

However, virtual laboratories have their limitations. One of the main challenges is to ensure that the results of experiments in a virtual environment are consistent with reality. That's why it's so important to develop tools to validate and verify results to ensure that computer simulations are reliable. Nevertheless, virtual laboratories have great potential, especially in fields such as physics, chemistry and biology, where traditional experiments can be time-consuming and expensive. The future of scientific research will be shaped by a range of technological innovations that are changing the way how we conduct research.

Big Data, artificial intelligence, interdisciplinarity, virtual laboratories and blockchain are just some of the tools that will play a key role in future research. However, with the development of technology, new challenges also arise, such as the need to ensure transparency, ethics and intellectual property protection. The science of the future will be more open, integrated and interdisciplinary, creating new opportunities for scientists around the world. However, it is important that this development takes place in a sustainable and responsible manner, with future generations of researchers in mind. Continuing the topic of innovation and the future of scientific research, it is impossible not to raise issues related to the globalization of science. The modern world is increasingly connected, which opens up completely new opportunities for scientists for international cooperation. Research that was previously limited to one laboratory or university today they can be conducted jointly by teams from different continents. This type of cooperation not only accelerates scientific progress, but also allows the exchange of knowledge and experiences between scientists with different cultural and scientific backgrounds.

The globalization of research also brings new challenges, especially in the context of research project management. International cooperation requires not only appropriate technological tools, such as research project management platforms, but also communication skills. Scientists must be able to communicate effectively with colleagues from other countries, which often means having to communicate in different languages and adapt to different cultural norms. Moreover, international cooperation also requires synchronization of activities and deadlines, which can be a challenge, especially in large-scale projects. Another important aspect of the future of scientific research is the growing role of automation. In recent years, automation has gained importance in many fields of science, and the future indicates a further development of this trend. Thanks to technological progress, scientists are increasingly using automatic systems to conduct experiments, analyze data and even formulate research hypotheses. Automation in scientific research not only speeds up the entire process, but also increases its precision, eliminating errors that may occur as a result of human activities. One example of automation in scientific research are laboratory robots that can

carry out complex experiments without human intervention. Such systems are particularly useful in fields such as molecular biology, where experiments can be time-consuming and require precision. Automation allows you to conduct experiments on a larger scale, which speeds up the process of discovering new drugs and therapies. In turn, in the field of data analysis, automation is mainly based on the use of artificial intelligence algorithms that are able to process and analyze huge amounts of data in real time. These algorithms not only identify patterns in data, but can also formulate conclusions and recommendations for scientists. In the future we can expect that the role of AI in research will constantly increase, and algorithms will become more and more complex and precise, which will allow for an even better understanding of research phenomena. However, automation and artificial intelligence in scientific research are not without challenges. One of the main problems is the issue of responsibility for research results. If research is conducted automatically by robots or AI algorithms, the question arises: who is responsible for the results and possible errors? Scientists must be aware that automation, despite its many advantages, also carries the risk of system errors that may

lead to incorrect conclusions. That's why it's important that automated systems are regularly monitored and checked for the quality of results, and that scientists must remain vigilant and accountable throughout the research process. Automation of research is also related to the issue of job reduction in the scientific sector. As more and more research tasks are automated, the question arises whether the traditional roles of scientists will remain the same. It may turn out that certain tasks that once required human work will now be performed by machines. Therefore, scientists must adapt to new realities by acquiring new skills, such as programming or operating advanced automation systems. At the same time, it is important that scientific research does not lose its human dimension it is still humans, with their ability to think critically, intuition and creativity, who play a key role in the process of discovering new phenomena.

Personalization is also an important direction of development in scientific research. In fields such as medicine and social sciences, researchers are increasingly paying attention to individual differences between individuals, which allows research and interventions to be tailored to the specific needs

of patients or social groups. Personalization of research is based on the use of advanced technologies, such as genetic analyses, that allow you to identify the unique characteristics of each person. In medicine, personalized therapies are becoming more and more popular, which allows treatment to be better tailored to the individual needs of the patient. However, personalization of research also poses new challenges for scientists. It requires access to detailed data about individuals, which raises questions related to privacy protection. Patients" personal data, especially in the medical context, must be adequately protected to prevent unauthorized use. In the future, research will need to strike a balance between personalization and privacy protection, which requires the introduction of appropriate legal regulations and security technologies. Another trend that will shape the future of scientific research is the growing role of sustainability-oriented research. In the face of global crises such as climate change, environmental degradation and resource depletion, scientists are increasingly focusing on research aimed at finding solutions to these problems. In the future, we can expect an increase in the number of research projects, that focus on sustainable development, both in the context of protecting the

environment and creating more sustainable economic and social systems. Sustainable development also poses new methodological challenges for researchers. Traditional research approaches, that were based on the use of natural resources without taking into account their limitations must give way to new methods that take into account the long-term consequences of human actions on the planet. In this context, scientists also need to develop new technologies that are greener and less invasive to the environment.

Interdisciplinarity plays a key role in sustainable development research. Problems related to climate, environment and natural resources are complex and require cooperation between scientists from various fields, such as biology, chemistry, physics, social sciences and economics. Only such an integrated approach allows you to find effective and lasting solutions that will respond to the challenges of today. One example of sustainability-oriented research is renewable energy projects. As fossil fuel resources are depleted, scientists are looking for new energy sources, that will be more ecological and available for future generations. Research on solar, wind and geothermal energy is becoming more and more important, and the

development of technologies in this area allows for an increasing use of renewable energy sources in everyday life.

In the future, sustainability-oriented research will also focus on creating new materials that are more environmentally friendly. Scientists are already working on biodegradable materials that can replace traditional plastics, as well as on new recycling technologies, that will allow for more efficient use of resources. The future of scientific research also means the development of new forms of cooperation between science and industry. As technology becomes more advanced, the need for collaboration between scientists and technology companies increases, that can use research results to create innovative products and services. This cooperation not only accelerates technological progress, but also allows for a better understanding of market needs and adaptation of research to the real needs of society. However, cooperation between science and industry also poses new challenges related to the ethics and independence of research. Scientists must be aware of potential conflicts of interest that may arise from collaboration with companies and strive to remain independent and objective in their research. In the future, it will be important to create clear rules on cooperation

between science and industry to ensure that research is carried out in accordance with the highest ethical standards.

The future of scientific research will be shaped by a range of technological innovations that are changing the way we conduct research. Automation, artificial intelligence, personalization, sustainable development and international cooperation are just some of the trends that will play a key role in future research. However, as these technologies develop, scientists must remember the challenges that technological progress brings, such as the need to protect privacy, research ethics or scientific independence. Only in this way will science be able to continue to develop, bringing benefits to society as a whole. In the area of scientific research, there is a wide range of tools that scientists can use to obtain reliable and valuable data. The choice of an appropriate research tool depends on the nature of the study, its goals, available resources, as well as the specificity of the issue being analyzed. In this context, it is worth taking a look at three main research methods that are widely used both in the social sciences and in other fields: an interview with an expert, a survey and a review of scientific literature. Each of these tools offers unique benefits, but also requires

skillful use to bring the expected results. An interview with an expert is one of the most direct methods of collecting qualitative data. It involves talking to a person who has specialist knowledge or experience in a specific field, which allows you to obtain valuable information about the phenomenon under study. An interview with an expert can be conducted in various ways it may be a face-to-face conversation, a telephone interview, and in the era of development of digital technologies, also a videoconference. The choice of the form of interview depends on many factors, such as the availability of an expert, study budget or geographical distance. An expert interview is especially valuable when a researcher wants to gain a deeper understanding of a topic that cannot be found in scientific literature or statistical data. The expert can provide information about current trends and development prospects for a given field, as well as the specific challenges it faces. For example, in research on technological innovation, interviewing an engineer or scientist working on new solutions can provide unique insights that would not be available otherwise.

This type of expert knowledge is particularly important in research on rapidly changing technologies or fields that are

still developing. For an interview with an expert to be effective, proper preparation is crucial. The researcher should thoroughly study the topic of the interview beforehand, to ask pertinent questions and not waste the expert's time on issues that can be found in the literature on your own. Questions should be open-ended, allowing the interlocutor to speak freely about the topic, rather than limiting answers to a simple „yes" or „no." Building a relationship with an expert is equally important an atmosphere of trust and respect favors obtaining more detailed and honest answers. Another popular research tool are surveys, which are particularly useful in quantitative research. Surveys allow you to collect a large amount of data from a wide group of respondents, which makes them extremely valuable in social, marketing, psychological research and many other fields. They can be carried out on paper, online or by telephone, and depending on the needs, the research may contain closed questions (where the respondent chooses from the provided answers) or open questions (where he can formulate the answer himself). Surveys are particularly useful when the researcher's goal is to obtain data about the preferences, opinions, or behaviors of a large group of people. For example, in marketing

research, surveys can be used to collect information about consumer preferences for specific products or services. In the social sciences, surveys can be used to analyze attitudes toward various issues such as politics, public health, and social change. Due to their wide range, surveys allow for the analysis of large samples, which increases the representativeness of the results. When creating a survey, the key thing is to carefully plan the questions. They must be clear and precise to avoid misunderstandings and interpretation errors. Questions should also be worded in a neutral manner, not to suggest answers or influence respondents" opinions. An important element is also the selection of an appropriate research sample — these must be people who are representative of the population we want to study. One of the advantages of surveys is the ability to process data using statistical software, which enables quick and precise analysis of results. Thanks to programs such as SPSS, R or Excel, you can perform a variety of analyses, from simple descriptive statistics to complex multidimensional models. However, one of the challenges with surveys is that responses may not always be honest or accurate, especially when respondents feel social pressure to respond in a certain way.

Therefore, it is important that surveys are carefully designed and conducted in a way that minimizes these types of errors.

The third research tool that is extremely important in scientific research is a review of scientific literature. A literature review is the process of collecting, analyzing, and evaluating existing scientific publications on a specific topic in order to understand the current state of knowledge and identify gaps that require further research. In many fields, such as medicine, psychology and engineering, a literature review is a fundamental step before beginning any empirical study. It allows not only to understand the research context, but also to identify methods that can be used in a new study. A literature review can be either a systematic review or a narrative review. A systematic review is a form of review that is based on precisely defined criteria for searching and evaluating the literature. This is a rigorous process and is conducted in an objective manner, resulting in a high-quality literature review. A narrative review, on the other hand, is more descriptive and allows for a broader discussion of the topic without such strict search criteria. A literature review is an essential tool for understanding what has already been researched in a given field, what results have been obtained, and

what research questions remain open. For example, research on new drugs usually begins with a review of the literature on existing pharmaceutical substances, their mechanisms of action, as well as the results of previous clinical trials. In the case of social research, a literature review can help to understand existing theories and approaches to the study of specific phenomena, such as social changes, inequalities or social attitudes towards specific issues. One of the challenges of a literature review is the need to filter through large amounts of information and select only those publications that are most valuable and relevant to a given study. In the age of the Internet, researchers have access to countless articles, reports, books and data, which can be overwhelming. For a literature review to be effective, scientists must use appropriate databases, such as PubMed, Google Scholar, JSTOR, SCOPUS or Web of Science, which provide access to high-quality scientific publications. It is also important to regularly update your literature review because science is evolving rapidly in many fields, which means that new discoveries can influence research results.

When creating a literature review, a researcher must critically evaluate the publications he or she reads. It is important

to understand what research methods were used in previous studies, what were their limitations, and how the results of these studies relate to the new research problem. Critical analysis of the literature allows for the identification of gaps in research, which may become the basis for formulating new research questions.

Each of the mentioned tools: expert interview, survey and literature review has its unique advantages and limitations. An interview with an expert allows you to gain specialized knowledge and deeper insight into the topic, a survey allows you to collect data from a wide group of people, and a literature review provides information about existing research and helps identify research gaps. In practice, researchers often use various research tools in one project to obtain the most comprehensive data possible and reliably answer the research questions. Modern science is based on interdisciplinarity and multidimensionality, therefore the ability to combine various research methods and tools is crucial for research success. The use of intelligence, surveys and literature reviews as complementary tools allow for obtaining a more complete picture of the studied phenomenon and a better understanding

of its complexity. Each of these tools has its place in the research process, and their skillful use may contribute to achieving new, groundbreaking results in scientific research.

Within scientific research, there are many different methods and tools that can support the researcher in achieving the goal. In addition to the methods already discussed, such as an interview with an expert, a survey and a review of scientific literature, it is worth emphasizing that scientists, students and researchers at various stages of their academic careers can also use their own books, publications and previously written theses such as bachelor's, master's or doctoral theses as valuable sources of information.

These personal works provide an important foundation for further research and can play a key role in developing new hypotheses, theories, and empirical studies. Using your own publications in scientific research is a tool that not only allows you to continue and develop previous work, but also allows you to deepen previously discussed topics. Researchers often return to their previous publications to update them with new data, supplement them with newer conclusions, or compare them with other studies. Bachelor's theses, master's or doctoral degrees

constitute the foundation for further scientific and research work they often determine the direction of a scientist's specialization. Importantly, these works are also part of scientific achievements and can be treated as a source of knowledge when conducting new research. When writing a bachelor's, master's or doctoral thesis, the student devotes a lot of time to thoroughly research the selected topic. This process involves collecting, analyzing and synthesizing information from a variety of sources. After completing this stage, however, the student should not be satisfied with merely passing the thesis on the contrary, he or she may return to it in the future, when working on more advanced research or scientific publications. Theses often contain detailed literature reviews that can be further developed, as well as empirical research that can be deepened or verified using new research tools. The benefits of using your own publications are numerous. First, using existing material saves time that would normally be spent re-examining the literature or planning a new experiment. In many cases, such publications can also serve as a reference point, allowing the results of new research to be compared with previous results. Secondly, using one's own works allows the researcher to consistently develop one topic,

which may lead to more in-depth discoveries and a better understanding of a given issue. Systematically developing your research around one thematic axis can contribute to building a solid scientific legacy. For people working on their doctoral or habilitation theses, publications from earlier stages of their academic careers can become milestones that enable progress in further research. Scientists often start with topics covered in master's theses and develop them towards more advanced research, verifying the hypotheses that appeared in earlier stages. These publications can be expanded, new research aspects introduced, expanded with new data analysis methods and developed with contemporary contexts. For example, a researcher who conducted a survey for a master's thesis may consider re-running it with a larger sample or over a longer period of time to see if the results have changed.

The use of one's own books or scientific articles in scientific works not only allows the researcher to build a coherent scientific path, but also strengthens his position as an expert in a given field. Each subsequent publication developing previous research increases the author's recognition and allows for building prestige in the scientific community. Researchers

who consistently develop one topic for years often become authorities in their fields, which opens the door to new opportunities for international cooperation, research projects or to act as a reviewer in renowned scientific journals. However, using your own scientific work in research is not without its challenges. One of the key issues is avoiding self-plagiarism, i.e. repeated use of one's own works without proper indication, that the material has already been published. Self-plagiarism may be perceived negatively by some scientific communities, so it is important to properly cite your own previous work and clearly indicate which fragments are a development of previous research. A scientist who refers to his previous publications should also remember that new research brings real added value and is not just a duplication of what has already been published. Another challenge may be the need to adapt previous work to new research standards. Science is developing rapidly, and methods that were considered modern and adequate a few years ago are may need updating today. A researcher who returns to his or her previous publications may notice that certain elements require adaptation to modern research tools, ethical standards or expectations of scientific editors. In addition

to using your own publications, literature reviews are an important research tool in scientific work. both those that we create ourselves and those that we can use when they were written by other researchers. In many cases, a literature review is not only a starting point, but also a permanent element that accompanies research at every stage. Regular updating of literature reviews, especially in dynamically developing fields, it is crucial that research stays up to date with the latest discoveries and trends.

Using databases such as JSTOR, ScienceDirect, Google Scholar or PubMed allows you to quickly access the latest articles, research and reviews that may be useful in developing your own scientific work. Databases offer tools that enable precise literature searches for specific topics, which speeds up the research process and allows you to quickly find relevant materials. Another key tool that can support researchers is data analysis software such as SPSS, R, Python and MATLAB. Depending on the field, researchers can use these tools to analyze large data sets, model complex phenomena, or test hypotheses. Modern science is increasingly based on the analysis of large data sets (Big Data), and the ability to use analytical

software is becoming essential for scientists in many fields, from biology to social sciences. It is also worth mentioning the importance of platforms for managing research projects, such as Trello, Asana or Basecamp, which facilitate the organization of research work, especially when research is conducted in larger teams. Thanks to these tools, researchers can effectively manage tasks, deadlines and research stages, which contributes to better use of time and resources. One of the important tools that can support researchers is bibliography management software. Tools such as Mendeley, Zotero and EndNote allow you to organize scientific literature in one place, which makes it easier to later cite sources and create bibliographies. This software not only allows you to automatically format footnotes in the selected citation style, but also facilitates access to full texts of publications and tracking, which articles are the most cited in a given field. To sum up, scientific research is a complex process that requires the use of many different tools. From interviews with experts, through surveys, to literature reviews each tool has its place and plays a unique function in the research process. A modern researcher must be flexible, ready to use a variety of methods and tools, as well as constantly update their

skills to keep up with dynamically changing learning standards. The use of own publications in research, combined with modern analytical tools, brings benefits not only to the researcher himself, but also for the entire scientific community, contributing to the continuous development of knowledge. In a world where technology and knowledge are developing at a rapid pace, scientists must be ready to use the full resources available to produce research of the highest quality.

4.2 Proposals for the future, possible directions for further Research

The study provided important information that sheds new light on the analyzed problem. The research results confirmed the hypotheses formulated at the beginning of the project, which proves the accuracy of the theoretical assumptions. In particular, it was noticed that there is a clear correlation between the analyzed variables. The collected data clearly indicate the importance of the examined relationships and their impact on further processes taking place in a given field. It is worth noting that the analysis conducted as part of the study showed both direct and indirect relationships, which confirms that that the

problem should be analyzed in many aspects, taking into account both primary and secondary factors.

The study also shows that depending on the methodological approach adopted and the scope of the studied variables, the results obtained may differ. For example, there were some inconsistencies in the qualitative analysis compared to the results obtained in the quantitative study. This suggests the need for further research to eliminate these discrepancies and clarify the current findings. One of the key conclusions from the study is the fact that that most respondents express satisfaction with the current situation, but at the same time point to areas requiring further improvement. This is a valuable conclusion because it shows that despite the positive assessments, there is a need for further process improvement. The collected data also allow us to distinguish a group of respondents, who have a different opinion and are more aware of the need for change. Their opinions are particularly valuable because they constitute a starting point for developing specific recommendations. Practical and theoretical significance of research The practical importance of the conducted research is undeniable. The results may have important applications to everyday practice in the

field because they provide an understanding of mechanisms that may have previously been unclear or not fully understood. The research conducted provides specific tips that can be used to optimize existing processes. For example, identified problem areas can be analyzed to develop a strategy to solve them. Research results can also be used to create new operating models that will better meet the needs of users or customers.

From a theoretical perspective, the research constitutes a valuable contribution to the development of literature on the subject. The obtained results not only confirm existing theories, but also indicate new aspects that require further exploration. Research shows that the existing theoretical models were too narrow and did not take into account all important factors affecting the analyzed problem. The analyzes carried out show that it is necessary to expand the existing theoretical framework, which will allow for a more complete understanding of the studied processes. Research conclusions can also be a starting point for developing new theories that will better respond to contemporary challenges.

The theoretical significance of research is also related to the possibilities of its application in other research areas. The results

obtained in this study can be used as a reference point in further work, especially in the context of comparative research. It is also possible that the obtained data will become the basis for formulating new hypotheses as part of interdisciplinary research projects. Proposals for the future: possible directions for further research Taking into account the results obtained and the conclusions drawn from the research, several areas can be identified that require further exploration. First of all, in future research it is worth focusing on an in-depth analysis of the identified discrepancies between qualitative and quantitative results. This analysis could help to better understand the mechanisms that influence these differences, as well as enable the development of more comprehensive theoretical models that take these nuances into account. One of the possible directions of research is to conduct longitudinal studies that will allow the observation of changes over time and their impact on the results. Further research should also take into account new technologies that may change the way analysis is performed. In the era of dynamic development of analytical tools, it is worth considering the use of advanced artificial intelligence algorithms that can help identify new patterns and relationships, that were

not visible within traditional research methods. This will make it possible to obtain even more precise results that will better respond to contemporary research challenges. An interesting direction for further research is also the exploration of differences between the results obtained in different cultural contexts. Conducting research in different countries could provide valuable information on the impact of the socio-cultural context on the results of the analyses. This type of research could also help develop universal models that can be used in a variety of settings, regardless of local specificities. An important area which requires further research, is also the analysis of the impact of new legal regulations on the analyzed problem. In the future, it is worth focusing on research that will take into account changes in legislation and their potential impact on the analyzed phenomena.

A particularly interesting research direction could be the analysis of the long-term effects of introducing new regulations and their impact on the functioning of the examined entities. Further research should also take into account the development of research tools that will allow for obtaining even more precise results. It is worth considering the use of new data analysis

techniques, such as big data or machine learning, which can help identify hidden relationships between the studied variables. In future research, it is also worth focusing on analyzing the effectiveness of various research methods, which will allow you to select the most effective tools for analyzing specific problems. There is also a need for further research on the impact of external factors on the analyzed problem. In the future, it is worth focusing on research that will take into account the impact of macroeconomic factors, such as changes in the economy or political situation, on research results. This type of research could provide valuable information on how various external factors influence the analyzed phenomena, which would allow the development of more comprehensive theoretical models. Future research should focus on a more comprehensive analysis of the identified relationships and on searching for new research directions that will allow for an even more complete understanding of the analyzed problems. Future scientists should be guided by several key principles that will not only make it easier for them to conduct research, but will also affect the quality and reliability of the results obtained. It should be emphasized that the development of science nowadays requires

much more from researchers than just the ability to think analytically and know appropriate research methods. A future scientist should be comprehensively prepared for challenges, faced not only by the academic environment, but also by the changing technological and social reality. The first and most important principle that every future scientist should follow is research honesty. Regardless of whether research is conducted in the laboratory, in the field or in virtual space, the highest ethical standards must always be maintained. Research results should always be reported fairly, without manipulating data or drawing conclusions that are not supported by evidence. Research integrity also includes respect for the work of other scientists plagiarism, even unintentional, is unacceptable and may have serious consequences not only for the researcher's reputation, but also for the entire scientific community. It is also important to avoid the so-called cherry-picking, i.e. selecting only those results that confirm the hypothesis and omitting those that may be unfavorable to it.

Future researchers should also be guided by an openness to criticism and a willingness to change their point of view in light of new evidence. A scientist who is closed to constructive

criticism risks having his or her work become dogmatic and detached from reality. Science is about constantly searching for new solutions and testing old theories, so future scientists should be ready to revise their assumptions if they turn out to be incorrect or incomplete. Please remember that criticism in the world of science is an inherent element of the research process it drives progress and leads to the creation of more precise theories. An important aspect that a future scientist should follow is interdisciplinarity. Contemporary research problems are rarely limited to one field of knowledge. Researchers are increasingly required to be able to combine different disciplines and use tools and theories that go beyond their core specialization. The exact sciences are increasingly being combined with the humanities, and digital technologies are entering areas traditionally reserved for the social sciences. Interdisciplinarity allows for a better understanding of complex problems and the creation of more comprehensive solutions. Future scientists should also pay attention to the social implications of their research. Science does not exist in isolation from society what researchers discover can have a real impact on the lives of millions of people. Therefore, every researcher

should consider what consequences his discoveries may have, both in ethical and practical contexts. Does research contribute to improving the quality of life? Can they be used in a way that is inconsistent with the researcher's original intention? A future scientist should be aware of the fact that that his work can have far-reaching effects, and he should strive to make those effects as positive as possible. Another important feature that a future researcher should follow is communication skills. Modern science is no longer just about publishing results in specialized journals.

More and more emphasis is placed on popularizing science and communicating research results in a way that is understandable to a wider audience. A scientist who can explain complex issues in an accessible way has a chance not only to gain greater social support for his research, but also for better understanding by political decision-makers and business representatives. Therefore, a future researcher should develop his or her communication skills, both written and oral. An important aspect of scientific work, especially in the context of future research, is also the ability to manage research projects. Future scientists will often have to manage research teams, plan

budgets, obtain financing and coordinate activities within various projects. Management skills are therefore crucial for research to be conducted efficiently and on schedule. A future scientist should also be ready to work in international research teams, which requires not only organizational skills, but also knowledge of different cultures and the ability to work in a multicultural environment. The future researcher must also be aware of dynamic technological changes, that take place in the modern world. Technological advances can have both positive and negative impacts on research. On the one hand, new technologies such as artificial intelligence or big data open up unprecedented opportunities for researchers to analyze data and model complex phenomena. On the other hand, future scientists should be aware of the dangers of over-reliance on technologies. Automation of research processes may lead to simplifications and omission of important nuances that would be noticed in a traditional approach.

Ultimately, future scientists must be guided not only by the desire to acquire knowledge, but also readiness to act for the common good. Science is not an end in itself, but a tool to improve the quality of life and understand the world around

us. Scientific research, regardless of its field, should be focused on solving problems that have a real impact on society. This means that a future scientist should be engaged in dialogue with society and strive to ensure that his work brings benefits not only to a narrow group of experts, but to a wide range of recipients. To sum up, a future scientist should be guided by research honesty, openness to criticism, interdisciplinarity, social awareness, communication and management skills, and readiness to use new technologies in a responsible manner. Science requires continuous improvement, and future researchers must be ready for the challenges of a changing world. Only by developing these key skills will they be able to meet the demands of today and contribute to the further development of science and improvement of the quality of life around the world. The development of a scientific career is a process that requires constant improvement of skills and deepening knowledge.

The modern scientific environment is extremely competitive and the demands placed on researchers are increasing. On the one hand, research must be innovative and respond to pressing social problems, and on the other hand, it must meet rigorous

methodological and ethical standards. That is why future scientists should pay special attention to the development of competences that will allow them not only to find their way in this dynamic environment, but also to succeed. An extremely important element of scientific work is also the ability to obtain funds for research. Financing scientific research is one of the biggest barriers that researchers face, therefore the ability to write grant applications and obtain financial support from public and private institutions is crucial. It is also worth emphasizing that cooperation with industry and non-governmental organizations may open up new research opportunities, that were previously beyond the reach of scientists working solely within traditional research institutions. We also cannot forget about the importance of education and mentoring in a scientific career. Future scientists should be ready to share their knowledge with younger colleagues, as well as with people outside the academic community.

Science is a field that is constantly developing, and knowledge passed down from generation to generation is crucial to its progress. Future scientists should therefore develop their

teaching skills and actively engage in the process of educating new generations of researchers. Continuing the previous considerations on this, what a future scientist should be guided by, it is worth paying attention to several additional aspects that have not yet been discussed, but which are equally important in the context of developing a scientific career. Above all, a modern scientist must demonstrate the ability to adapt to changing research conditions and the challenges posed by the globalization of science. Nowadays, research is conducted not only at the local or national level, but is increasingly international in nature, and in many cases they involve various institutions from different parts of the world. For this reason, a scientist must be open to cooperation with researchers from other countries and to diverse research perspectives. International cooperation brings many benefits, such as access to unique resources, new technologies, as well as the ability to conduct research in various cultural and geographical contexts. A modern scientist cannot limit himself to working in one research institution, but should strive to build a wide network of professional contacts that can help develop research and promote its results internationally. Another important element that cannot be forgotten is the role

that scientific publications play in science. A future scientist should be aware that publishing the results of their research is not only a way to document their achievements, but also a key element in building a scientific career.

High-quality publications in reputable scientific journals are often one of the main criteria for evaluating scientists, both by academic institutions and potential research partners. However, it is worth remembering that publishing results is a process that requires patience, as well as editorial and communication skills. Research must be presented in a clear, precise and understandable way, both for experts in a given field and for a wider audience. Another point worth mentioning is the importance of building a scientific reputation. This reputation is not built solely on the number of publications or the prestige of journals, in which these publications appear. It is also the way in which a scientist engages in social activities, participation in scientific conferences, as well as his ability to promote his research outside a narrow academic circle. Today's media, including social media, they offer new opportunities to build the image of a scientist and popularize research results. Therefore, a future scientist should develop his or her skills in science

communication and marketing to better reach a wide audience and demonstrate the value of his or her discoveries. The importance of research financing in the context of a scientific career cannot also be ignored. Obtaining funds to conduct research is an indispensable element of a scientist's work, and the ability to obtain research grants often determines the possibility of implementing ambitious projects. A future scientist should be familiar with various sources of research funding, both at national and international levels. It is also worth developing the ability to write grant applications, which in many cases determines the success in obtaining funds. A scientist should be prepared to apply for various forms of support, from research grants to scholarships and partnership programs.

Another aspect worth mentioning is the role of mentors in the development of a scientific career. For future scientists, especially those starting their research path, the support of an experienced mentor may be crucial. The mentor not only shares his knowledge and experience, but also helps you navigate the complexities of the academic world. It is therefore worth actively looking for mentors who can help you develop your career by offering valuable tips and advice on conducting research,

obtaining financing, and building a network of professional contacts. At the same time, the future scientist should strive to to become a mentor for younger colleagues in the future, thus continuing the tradition of sharing knowledge and experience. Attention should also be paid to the development of soft skills, which are increasingly valued in the scientific community nowadays. Ability to work in a team, manage projects, as well as negotiations and mediation in multicultural environments these are competencies that may determine success in conducting research. A future scientist should therefore invest in the development of these skills by participating in training and courses that will help him function better in a complex and often demanding research environment. It is also worth developing leadership skills, which will be key in managing research teams and managing large-scale projects. Technological innovation also plays a key role in advancing science, and future scientists should be aware of the latest research tools and technologies that can support their work. In the era of digitalization, the ability to use advanced analytical tools, databases, as well as technologies related to big data and artificial intelligence is indispensable. Therefore,

a future scientist should constantly expand his technological knowledge and be ready to experiment with new tools, that can speed up the research process and improve the quality of the results obtained. The use of innovative technologies can also increase a researcher's competitiveness on the labor market, opening up new professional opportunities in various economic sectors.

An important element of the development of a scientific career is also the social responsibility of the researcher. Science should not be detached from the problems that contemporary society struggles with. A future scientist should be involved in solving real social problems, such as climate change, health problems or issues related to social inequalities. Scientific research has enormous potential to create solutions that can improve the quality of life around the world. Therefore, a scientist should be guided not only by professional ambition, but also by the ethics of responsibility towards society and future generations. At the end, a future scientist should take care of work-life balance. Scientific work often requires enormous commitment and dedication, which may lead to burnout. Therefore, it is important for a scientist to be able to manage his or her time and find

a balance between work and rest. Taking care of your physical and mental health is crucial to maintaining high productivity and creativity in research work. Scientists who take care of their health and have a healthy work-life balance are more effective and have a greater chance of long-term career success. A future scientist should be guided by a number of principles that include both an ethical approach to conducting research and the development of skills necessary to work in a dynamically changing scientific environment. Social responsibility, interdisciplinarity, communication skills, project management and the use of the latest technologies are key elements that should be the foundation of every scientific career. Science is constantly evolving, and the future scientist must be ready to adapt, constantly develop and take on new challenges in order not only to discover new facts, but also contribute to solving global problems and shaping a better future for future generations.

Writing diploma theses and conducting research in the area of security, protection of people and property is an extremely important stage in the development of a future scientist and practitioner in this field. Today, security issues are one of the key

elements of the functioning of societies, both at the micro level (protection of private property) and at the macro level (national or international security). That's why it's so important so that future researchers undertaking the exploration of this topic demonstrate not only in-depth theoretical knowledge, but also a practical approach that will allow for real application of the results of their research. First of all, a future student and scientist should realize that research on the security of protection of persons and property is interdisciplinary. This means that you cannot limit yourself to only one field of knowledge. Legal, psychological, technological, organizational and social aspects must be taken into account. Knowledge of law is crucial, because every security system must operate in accordance with applicable regulations. Therefore, a scientist should be up to date with regulations regarding the protection of persons and property, as well as with international standards that often set safety standards. On the other hand, an understanding of human psychology is invaluable in the context of studying threat behavior. Knowing how people react in crisis situations, how they perceive risk and what factors may influence their decisions is of great importance for designing effective protection systems.

For example, in emergency situations, such as fires, terrorist attacks or attacks, the psychological reactions of people at risk and security guards may have a key impact on the outcome of the event. Knowledge of modern technologies is also an important element of security research. Currently, most security systems are based on advanced technological tools, such as monitoring systems, motion detectors, smart cameras, and even systems based on artificial intelligence and data analysis. Therefore, a future scientist must be aware of the latest technological solutions and their potential applications in the context of protecting people and property. These technologies not only make it easier to monitor the situation and respond to threats, but also enable prevention through data analysis and identification of threat patterns.

When a future student decides to write a diploma thesis in this field, one of the first steps he must take is to choose an appropriate research topic. This topic should not only be interesting, but also practical and relevant from the point of view of contemporary security problems. For example, a student may study the effectiveness of video monitoring systems in public spaces, analyze crowd behavior in crisis situations, or assessing

the effectiveness of physical protection procedures in high-risk facilities. The choice of topic should be supported by a thorough analysis of the subject literature and the identification of research gaps that may become an inspiration to conduct your own research. In the process of writing a diploma thesis, it is extremely important to properly formulate the research problem. In the context of security protection of persons and property, the research problem may concern both theoretical and practical aspects. For example, a student may ask a question, how to effectively integrate various security systems to minimize the risk of burglary and theft in commercial facilities. Another example may be the question about the effectiveness of preventive activities in the protection of public places, such as stadiums or airports. It is important that the research problem is clearly formulated and based on real needs and challenges faced by institutions responsible for security. The next important step in the research process is the selection of appropriate research methods. Depending on the nature of the problem, a student may choose to pursue qualitative or quantitative research, or in many cases a combination of both. In the context of security protection of persons and property, quantitative research may

include, for example, statistical analysis of crime data in specific regions, as well as an assessment of the effectiveness of various security measures. In turn, qualitative research may consist in conducting interviews with experts from the security industry, analyzing cases of incidents related to security breaches, or observing the actions of security guards in practice. Research ethics is also an important aspect that students should take into account.

Research in the field of protection of people and property often concerns sensitive data and situations that may have a direct impact on people's lives and safety. Therefore, it is necessary to ensure that research is carried out in compliance with the highest ethical standards, including the protection of personal data and confidentiality of information. In the case of field research, for example, when monitoring security activities in public places, the researcher must also take into account civil rights and liberties, such as the right to privacy.

A future scientist must also understand that writing a diploma thesis is not only collecting data and analyzing it, but also drawing conclusions and formulating recommendations, that may have practical applications. In the field of protection

of people and property, research results often have direct implications for the operation of security companies, public institutions, as well as for state security policy. For example, the results of a study on the effectiveness of various alarm systems may influence the decisions of security companies regarding the implementation of new technologies. In turn, analyzing crowd behavior in crisis situations can help develop new evacuation procedures in public places. Finally, it is also worth mentioning the role what role theoretical knowledge plays in security research. Although many tasks in this field are practical, a solid theoretical foundation is crucial to understanding complex conservation phenomena.

Therefore, a future scientist should devote enough time to familiarize himself with the literature on the theory of security management, the sociology of risk, and the psychology of crisis. This type of knowledge will not only allow for a better understanding of the problems being studied, but will also facilitate the formulation of new research hypotheses and the interpretation of results. In the context of future research on the security of protection of people and property, it is also worth paying attention to developing technologies such as blockchain

or the Internet of Things (IoT). These new tools may revolutionize the way how people and property are monitored and protected. For example, blockchain-based systems can ensure that security incident data is indisputable, which can be useful in criminal investigations. In turn, IoT devices can automate the processes of monitoring and responding to threats in real time. A future student and scientist dealing with the protection of people and property should be guided by an interdisciplinary approach that combines legal, psychological, technological and organizational knowledge. Research should be conducted in compliance with the highest ethical standards, and the research results must have practical application, contributing to improved safety in various contexts. The selection of appropriate research methods, a clear formulation of the research problem and knowledge of the latest technologies are the key elements that a future scientist should take into account when planning and implementing his research. Only such an approach will allow for the creation of reliable and useful results that will have a real impact on the protection of people and property, as well as on the development of science in this area.