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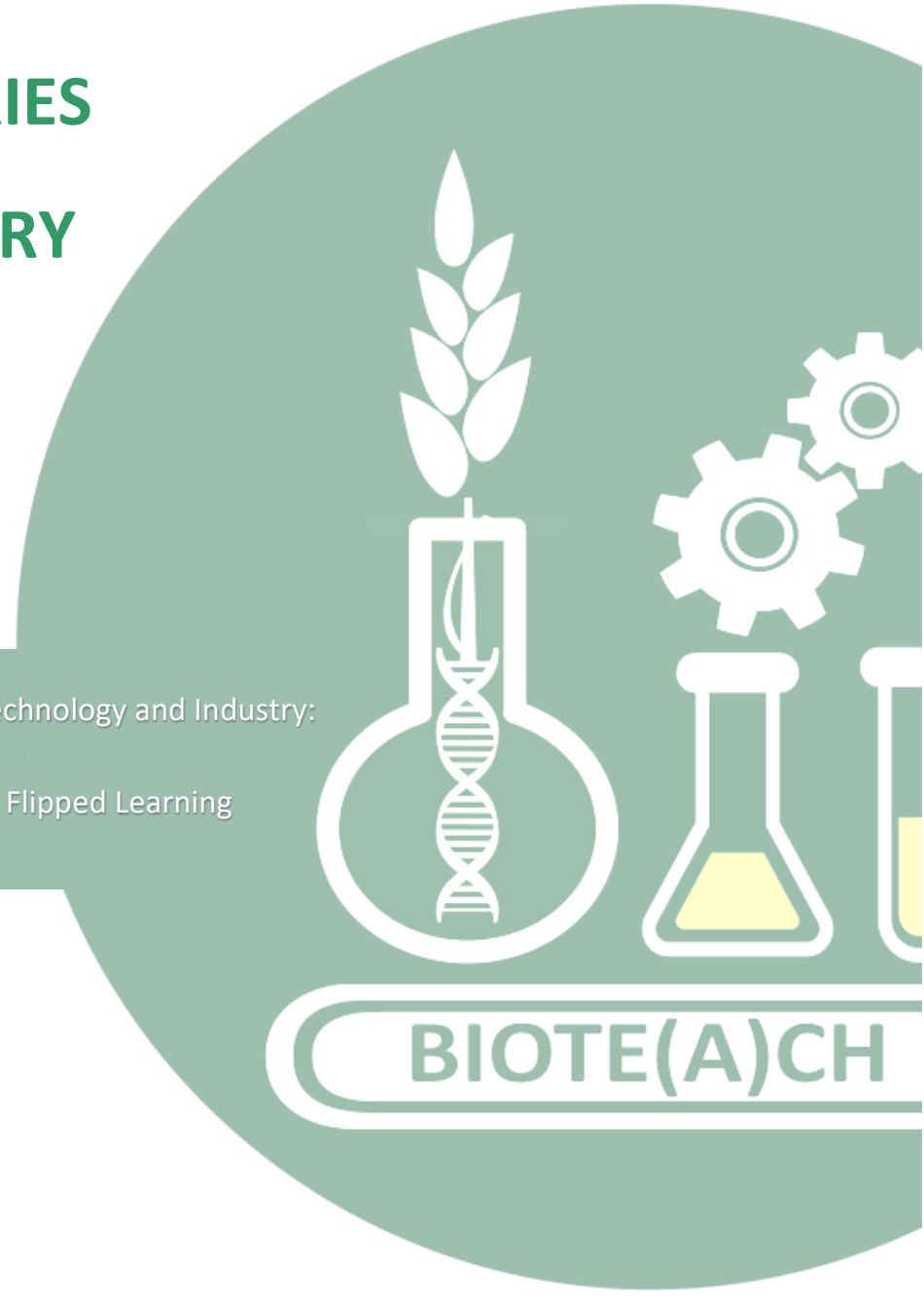
SUCCESS STORIES FROM INDUSTRY

Bridging the Gap Between Biotechnology and Industry:

Integrating Design Thinking and Flipped Learning



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The images in this booklet were retrieved from www.pixabay.com and we appreciate their work, letting us to build upon them and share them with you, our valuable readers and educators.

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Table of Contents

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Introduction

Biotechnology is an industry focused on the manipulation of enzymes and microorganisms to create technology and products that help improve our lives and the environment with the motto: "heal the world, fuel the world and feed the world".

As this very motto signifies, biotechnology products such as recombinant vaccines (become very well-known together with COVID-19 outbreak), antibiotics, nutritional supplements, pest-resistant crops, biofuels, bioplastics, biotechnology-based drugs (today, comprise 20% of the drugs produced in the world and their usage continually increasing), fermented food and drink, and pasteurised dairy products are developed for the benefit of people and our planet. The professionals working in the biotechnology industry have to be equipped with various professional skills (including transversal skills) in order to reflect their creativity and productivity in their works.

Success stories of those professionals, how they perceive the workplace, how they approach problems that biotechnology could be a solution, and how they made progress during their career development will enlighten the future steps of graduated students in their career development processes. For this purpose, we interviewed with 10 successful people working in the biotechnology sector and received their experiences and opinions that will contribute to our teaching processes.

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1. Stories from Türkiye

Glycogest Biotechnology

1.1. Sercan Karav

1.1.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

Thank you for the question. One of our successful projects is the development of novel in vitro digestion model. And what we did is that we integrated microbiome associated enzymes into the current in nutritional digestion models to mimic human digestion system better. I can give this example as our successful project.

I believe that every success depends on a problem and how you solve how we solve this problem. In our case, in previous studies or current methods we only use host associated enzymes. But in our digestion system there are millions of microorganisms. That also produce so many enzymes which are active on our digestion. So in in our case the problem was that these models were ignoring the human microbiome associated enzymes completely. So, I can say that our success actually depend on this lack of microbiome associated enzymes on the current models and we produce, we use a novel approach to solve this problem.

1.1.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

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Once we developed a novel method, we started to collaborate with both universities and some industrial partners. Once we realise that our approach had an effect. On other part. Owners, we felt that we did something successful because it has also had effect on different partners, different projects.

We had a funding from TUBITAK to develop this method, but since it was a huge project, we had some funding issues. So, we had to apply for different grant proposals to get more funding, especially during the scale up process. This was the first actual problem that we faced with during the development of this model. Also, we had some problems about the marketing. Of course, once you had a novel method or novel product you need to advertise it to get more people know about your studies. So, we had to use some professional support for marketing our product.

1.1.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

Before you start a project, you need to do the risk assessment before you start. For our case, the first problem that we faced was the scale up. Of course it was very easy to produce our product in lab scale but once you want to scale up your product, actually you need different instruments, bigger scale instruments to produce larger amount of, for example enzyme. So how we deal with it is collaboration with other partners. Other industrial partners.

I think the best scenario will be the analysis of similar company success stories. Because to saw every solution that was created, but then we figured out that so many companies went through the same problems. So, if we had a better communication with our, for example, competitors or similar companies, we could develop the solutions faster and easier actually.

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1.2. Ayşe Biçen Bayraktar

Uluova Süt A.Ş.

1.2.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

I had a problem in the laboratory. I was missing a material and needed to complete it because the continuity of a project depended on me. I remembered that I needed to directly contact the companies I learned about at the university, as they too could handle things, not just myself, but some of their tasks belonged to some companies. I contacted the companies, and thankfully, the company representative made a great effort. At the end of a week, we were able to supply the material. It caused me a lot of stress from abroad, but I felt much relieved after solving it. I overcame a problem thanks to my experiences at the university.

Experience. But the experience at the university, that is, my advisor professor used to delegate some material purchases to us. We would be responsible, responsibility was given to us. We would go and contact the companies. When he said you handle the problems, we would solve them.

1.2.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

The company I am currently at supports my training. While most companies might not support this, mine does. This is actually a success in my eyes because I have also completed my master's degree. I am currently doing my Ph.D., and when there is a class I need to attend or some work related to the

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university, there is no hesitation. They say, "Okay, you can go." This means they trust me and acknowledge my success.

I want to talk from a laboratory perspective. I work there. Sometimes the results may not turn out as we want, and I wonder if I made a mistake or if there was an error during the analysis. It even affects my sleep. I keep thinking and cannot find a way out; I check all the controls. There are negative and positive controls for the work. I thoroughly check these. I go through the validations. Everything seems okay, but the results are not as they should be. Later, we contacted the company. We conducted simultaneous studies with the company and identified the mass as the problem, which was a relief, but it took a toll on my life. You have to continue without letting your morale drop by proving yourself and not letting your teammates demoralize you. Otherwise, it would have been easy for both of us to just quit. Now we have established our new routine and set up our own team. Things are more comfortable now.....

1.2.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

As we mentioned earlier, we use persuasion and proof methods when we want to start a project. For example, we first conduct a study as a prototype. A major example of this is our work on embryo transfer. Our in-vivo studies initially started, and because we were successful, we are now able to surpass the UK, and my projects are based on this. But if that had not been successful, we would not have been able to convince the necessary management or the projects we could apply for because we need support, both financial and moral, to start a project. Therefore, we need to present a prototype study. One of the biggest steps I took alone here, despite having no prior knowledge, was succeeding in in-vivo and then moving on to in-vitro. The biggest barrier to success is people's disbelief.

B) Recording everything, taking notes on everything is essential because humans forget; what is written remains, as they say, "words fly away, but the written word stays." I, in particular, take notes on everything. I have many notebooks in the laboratory, including my personal and shared notes. One of the biggest problems I've encountered in this company is the lack of sharing past notes. Some of my colleagues in the company I worked for are open to sharing notes and information. My current teammates are the same, but taking notes and keeping records has helped me solve some of the problems I've faced. My notes and records also help when moving forward; if I forget something, I can look back at my notes to find solutions.

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1.3. Merve Alkan

Uluova Süt A.Ş.

1.3.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

In my early days at the job, we were producing pasteurized milk. We filled the bottles with milk in a cold state and delivered them to the customer. We received a complaint about a manure smell in one batch of milk and the subsequent 23 batches. While trying to solve the issue, we reviewed the entire process from start to finish and noticed that the bottles we were filling with milk had a smell, which was causing the odor in the milk. As a precaution, we checked the storage area for the bottles and found that they were stored in a depot where livestock was heavily present, and that was where the smell was coming from. We then changed the storage location of the bottles to a place under our control and resolved the issue, marking my first successful experience.

I believe there was a very solid risk analysis, hazard analysis, and identification of critical control points. We had milk with an odor, and we needed to follow the process from start to finish, considering both environmental and mythological factors. This, of course, was a result of the education we received at university. By incorporating sensory analyses and tracking all inputs from the beginning to the end of the process, including the packaging, we ultimately solved the problem in the packaging. We learned that we should not look at it from only one angle; we should not have searched only in the milk. We solved the error by tracking external inputs. In essence, the real solution was conducting a systematic hazard and risk analysis.

1.3.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself

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successful? How did you deal with the possible lack of motivation along the way?

Let me talk about production. For us, it is important that the product is healthy, appeals to customers, and primarily satisfies you when you taste or analyze it. I work in the pasteurized yogurt production department, and we had a challenging journey. Our yogurts began to be disliked by everyone. The taste deteriorated, and there were some sensory issues like syneresis or acidification, leading to poor quality yogurt. This was an ongoing issue that we were unfortunately trying to solve. It could also be due to internal conflicts within the company. While everyone thought they knew best, it could actually harm the company, and we needed to get rid of such issues. The turning point was when I took control of the production and made the first batch with my own recipe and methods. We celebrated the successful outcome with my team at a picnic. It was such a significant turning point because I couldn't do what I wanted; I couldn't express the mistakes I saw. It was a tough period for me because the person I needed to speak to was my superior and wasn't listening to me. There was a time when I couldn't convince anyone. So, when I took control and produced as I wanted, I achieved the desired result, and the whole company agreed on this. It was a turning point for me and a point where I trusted myself.

Our production is not just about how and where it is done. I conducted continuous trials with a small amount of milk. Maybe I was wrong, but I needed to prove it to myself first. I conducted small R&D trials on my own. Sometimes, I made small changes in production on my own; for example, I couldn't make such changes in the entire production of two yogurts. First, I proved myself. Then, as I said, by integrating it into the entire production, we actually succeeded. In other words, we dealt with low motivation by constantly trying, monitoring the results, and striving for better while believing it could be done.

1.3.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

Initially, our production costs were very high. A significant portion of these costs was related to washing and cleaning the production line after production, as well as chemical and energy losses, which directly affected our pricing in the market, making it higher. We managed the production, and our products were as we wanted, but to reduce costs, there were washing protocols suggested by companies. This led to us using more chemicals, which in turn secured their guarantees but cost us

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about five times more. We started questioning whether all this was really necessary. Why use 900 units of something when 800 might suffice, or even 700? Who sets these parameters, and why are we exposing ourselves to so many chemicals? We could have set the parameters better ourselves, but it wasn't without risk. We started reducing the numbers gradually, lowering the duration and the chemicals used, and optimized the process for ourselves. We found that we could do it in 750 seconds instead of 900, reducing water loss. It was a lengthy process because we had to monitor every product and the water discharge from the line after washing to check for pollution. We had to observe it through cameras, which required time. During this process, we faced obstacles from the company. They were adamant, but we reduced the water usage, and thus the chemical usage, which not only prevented water loss but also reduced our energy and costs.

During this process, I learned to collect as much data as possible without dismissing anything as unnecessary. The more samples we could take and analyse, the more results we had, which allowed us to piece together the puzzle and reach a definitive conclusion. As I mentioned, we took samples from areas we washed and areas we did not, avoiding assumptions of unnecessary testing. We continued this for a while. The most important lesson we learned here is that even the smallest detail, which might seem unnecessary, can lead to success or failure. You need to track everything.

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2. Stories from Slovenia

2.1. Andrej Perko

Vino Perko – Winemaking Family Business – Production and processing manager

2.1.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

When I took over responsibility in the family business, we raised the level of the company - we immediately outperformed in international evaluations. A good example is Pinot Gris - previously a variety that was not marketable, now the second best-selling variety because we have improved production technology. The international exchange and the experience at the FKBV (Faculty of Agriculture and Life Sciences) have contributed to this. I was able to put the theoretical knowledge from my studies into practice, which then had an impact on the company, including our penetration of foreign markets.

One of the most important success factors is an orderly and supportive environment within the company – the trust of the older generation in the young, and that young people are given the opportunity to put their ideas into practice, despite their lesser experience. In my case, it was also very important that I found a direction that interests me and where I feel passionate. I have always been interested in agriculture and viticulture, and that is why I have looked into it more - studying was not a chore for me – but I also had the support of an environment that knew what I was capable of. My professors also encouraged and guided me, and helped me to make contacts with foreign institutions, where I acquired key skills. The student-professor relationship is very important to me, but it depends

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a lot on the student, who must show interest. My opinion is that students see education too much as something they just need to have rather than something they really want to do. You learn to think critically, to make selection of information, to connect with people who are relevant to our objectives (the work of the company), and to be interdisciplinary.

Another important success factor for me is the collaboration with my brother (his fields are economics and marketing): we have combined our skills and experience in the company.

2.1.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

A key turning point was the improvement in the technology of grape growing and processing, which was reflected in the quality and sales of the wine.

I strive for constant improvement, so it is difficult to define success. I consider this important, though, so that the company can develop and progress. I have laid the foundations to give myself a chance to become successful.

I would say that I am successful in the sense that I understand the basics of the profession and the technological processes, and that this is already showing positively in the development and growth of the company.

Lack of motivation is when you realise that not everything is in your power, and you are often prevented from implementing certain ideas. I solved this problem by getting people close to me, to work together and support each other and find a solution together. In our business, you are very dependent on the weather - last year, for example, we had more than 50% crop damage. You can work hard all year and then have no control over it, and your motivation can run out in an instant. On the other hand, you see that your customers support you and understand - they are the ones who make you feel like your effort paid off.

Motivation can also drop when you see that, for example, other countries have a better support environment than your own region or country. When you see that we don't all have the same opportunities when entering a market, it affects your motivation. Sometimes you come across some constraints that make it difficult for you to compete with other producers in the market.

Additionally, there is agricultural policy - a supportive environment that actually limits us in our work.

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Young people often run out of motivation if relationships are not in place or if there is not a good supportive environment.

2.1.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

One barrier for a young person coming straight from college is lack of experience. Often you have to prove yourself, and on this path of proving yourself the employer/owner's doubts become apparent. So, it takes more effort to demonstrate your knowledge before you can gain some confidence. Especially when you want to improve a technology that maybe older people are not familiar with, there is doubt (they don't know what it is and what will come of it), and you don't have a supportive environment at that moment. It is only when success becomes apparent that everyone is happy. But it takes a lot of proving and convincing.

If you work in a family business, it takes a lot of energy and knowledge to be taken seriously. That is why I would suggest that students go abroad during their studies to gain experience and then go home to work (if they have a family business, for example).

A lot of times in agriculture you are faced with a lack of financial resources. We lack a favourable credit environment, but in foreign markets people have better conditions in the same field. We also have a lot of bureaucratic complications. As far as taxes are concerned, not all producers are treated equally (because we have three different rates). The more successful you are, the more it weighs on you.

Too often we don’t have a supportive environment (advisory service, ministry, bank, etc.) that understands the requirements of the business.

Lesson 1: You should be able to separate parent-child, employer-employee or co-worker relationships.

Lesson 2: (during your studies) You must not be afraid of unfamiliar surroundings, because if you have the will and if you believe in yourself, you can succeed. Never say, "I don't know, so I can't do this". You shouldn’t always wait for others to do something; you have to be a pioneer in something. Don’t be afraid of new approaches.

Lesson 3: You have to believe in your product. Sometimes you think you didn’t do something very well and then your customers show you that it's not true.

Lesson 4: You have to know how to connect with the right people. Sometimes you may find yourself around people who lead you down the wrong path.

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Lesson 5: It’s important to know how to focus and make decisions – to do things your own way sometimes. Don’t be afraid to trust yourself, despite being taught differently by someone.

Lesson 6: When it comes to business relationships, the “don't do business with your friends” phrase is quite accurate.

2.2. Janez Gorenšek

Institute of Applied Mycology and Biotechnology (IAMB Institute) - Founder and director

2.2.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

The successful experience is ongoing. It includes the development of a holistic system, a synergetic system of food supplements. I’ve sold most of my products to Germany, medicine there has no problem with such products. It is also possible to carry out alternative therapy for people who don’t respond well to mainstream treatment – I take over such cases. You can officially treat people with mushrooms with the help of oncologists in Germany. To see positive results in a larger sample of people, then you don't need to do marketing – it just sells itself. I have developed procedures and doses, regimes, etc. in vivo to extract medicinal substances from mushrooms.

One important motivation factor for people to take up such things – the things that mainstream medicine rejects – is that you can help people improve their quality of life.

An important success factor for me was getting in touch with an owner of a holistic clinic in Germany – a Slovenian who had a personal experience with the product. Apart from that, the success factors are internal – motivation, satisfaction with the work, inner drive.

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2.2.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

The biggest success for me was to establish myself in this environment because there was resistance at the beginning. But this local environment has welcomed me after all, and they support me. People see what we do as something good.

There was no lack of motivation; in fact, the obstacles and people's negative opinions gave me an extra push.

2.2.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

The first obstacle I faced was acquiring the building. Due to the Coronavirus pandemic, the bank rejected financing. Primarily, however, the obstacle was environmental resistance – prejudices and lies, to be more specific. I managed to overcome those obstacles by believing in myself and being persistent, determined. Then I was able to convince people; they started coming to me for advice and help when faced with some illness. They realised that I was helping them.

I like to think that I see what others do not. I buy a machine that’s not in perfect condition and I fix it myself. I strive for optimisation – a lot can be done with little energy. There should be no mistakes, I want to have reliable colleagues and not too many of them. I don't need marketing; a good product sells itself because people see that it works, and they share their experiences.

It is important to build a consortium to get quality mushrooms to the target groups – to teach people how to use mushrooms properly in cooking.

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3. Stories from Greece

3.1. Sakellaropoulos Nick

Sakellaropoulos Organic Farms

3.1.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

One of our successful experiences with our company was receiving over 833 international awards for our organic olive oils and olives. Despite starting in an era when organic farming was not well-known in Greece, we persisted and eventually garnered acclaim on the global stage for the exceptional quality of our products.

The most important factor that led us to this success was our unwavering commitment to quality and innovation. We invested in research to identify health-protective ingredients, such as polyphenols and oleocanthal, which differentiated our products in the market. Additionally, our dedication to organic farming practices and sustainable production methods ensured the integrity and purity of our olives and oils, resonating with health-conscious consumers worldwide. The high polyphenol content in our olives and the abundant oleocanthal in our olive oil are key components that enhance the health benefits, further solidifying our reputation for superior quality.

3.1.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

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The turning point that marked our success after a challenging journey was the moment we started receiving international recognition and awards for our organic olives and oils. Years of dedication to organic farming, innovation, and quality have been globally recognized, endorsing our efforts and affirming our position as industry leaders. This recognition instilled a sense of pride and accomplishment within our family, making us view ourselves as successful in our mission to produce high-quality organic products.

Moreover, our collaboration with prestigious institutions, such as Harvard and Yale Universities, in clinical research on olive oil has been crucial in highlighting the health benefits of our products.

We may have drawn inspiration from our passion for organic farming and our commitment to producing healthy and sustainable products. Additionally, setting clear goals and milestones provided us with a sense of direction and purpose, helping to maintain motivation during challenging times. Surrounding ourselves with a supportive network of family, employees, and peers in the industry also provided us encouragement and motivation to persevere through obstacles. Moreover, celebrating small victories along the way and reminding ourselves of our ultimate vision for the business helped us stay focused and motivated, despite the challenges we encountered.

3.1.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

In our journey to success, we faced several obstacles. One major challenge was market resistance to organic products. To overcome this barrier, we focused on educating consumers about the benefits of organic farming and the superior quality of our products through marketing campaigns, tastings, and participation in industry events. As the organic food market grew, competition intensified. We differentiated ourselves by focusing on innovation, quality, and sustainability and by building strong relationships with our customers and distributors. Through these strategies, we navigated the challenges and continued to thrive in the organic farming industry.

Success often requires perseverance to face the challenges and setbacks; hence, we 've become committed to our goals and vision, even when obstacles arise. Innovation is crucial in a competitive market and thus we continuously improve our products and processes to meet evolving consumer preferences and industry standards. Building strong relationships with customers is crucial. We consider to their feedback, respond to their needs, and cultivate a sense of loyalty through excellent

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products. We continuously adapt to market trends, regulatory changes, and other external factors to remain competitive and resilient. These lessons have been crucial in our journey toward success.

3.2. Pergantas Panagiotis

Bioapplications ltd

3.2.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

One of our notable successes involved the development and implementation of a comprehensive model for predicting the spread of diseases transmitted by mosquitoes. This model incorporated environmental, epidemiological, entomological, and social data, leveraging modern technologies, such as telematics, chemical analysis, and geographical information systems (GIS). Through collaboration with research bodies and scientific institutions, we were able to refine and validate the accuracy of the model.

The most important factor that led to the success of our disease prediction model was our commitment to scientific rigor, innovation, and collaboration. By assembling a team of highly specialized scientists and staff with diverse expertise, we were able to develop a holistic approach that addressed the complex factors influencing disease transmission by mosquitoes. Our dedication to continuous learning and improvement, coupled with state-of-the-art technology and facilities, enabled us to overcome challenges and deliver a solution that provided real-time insights into disease spread, ultimately contributing to improved public health outcomes.

3.2.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself

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successful? How did you deal with the possible lack of motivation along the way?

The turning point for us came after years of dedicated research and development, when we successfully implemented our disease prediction model in collaboration with research bodies and scientific institutions. This milestone marked the culmination of extensive efforts to integrate various data sources and technologies into a comprehensive tool for combating mosquito-borne diseases. Seeing our model in action, providing real-time insights and contributing to proactive disease control efforts, was a defining moment that made us consider ourselves successful.

Throughout our journey, we encountered challenges and setbacks that tested our decissions. During moments of lack of motivation, we drew inspiration from our mission to improve public health and environmental management in Greece. We reminded ourselves of the impact our work could have on communities, motivating us to persevere through difficulties. Additionally, fostering a supportive team environment, helped us stay motivated and focused on our goals. Celebrating small victories along the way also served as reminders of our progress and kept us motivated to continue moving forward despite obstacles.

We always bear in mind these lines from Kavafis' poem Ithaka:

"Laistrygonians and Cyclops,

angry Poseidon—don’t be afraid of them:

you’ll never find things like that on your way

as long as you keep your thoughts raised high,

as long as a rare excitement

stirs your spirit and your body."

These words remind us to stay focused, inspired, and resilient, encouraging us to pursue our goals with passion and determination, regardless of the challenges we face.……

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3.2.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

Dealing with bureaucratic processes of the Greek state services can be time-consuming and complex. Ensuring approvals, and funding for research projects or large-scale interventions may require navigating through layers of government regulations and procedures. Identifying research bodies, universities or other organizations with a similar mindset and commitment to innovation in public health and environmental management may not always be straightforward. Building trust and establishing mutually beneficial partnerships requires time, effort, and shared values. Despite these challenges, Bioapplications' success in collaborating with state services and finding partners with a similar mindset demonstrates its ability to overcome obstacles through persistence, diplomacy, and a commitment to shared goals. By demonstrating the value of its expertise, technology, and approach, it can forge productive partnerships that advance its mission of improving mosquito control and disease surveillance in Greece.

Success depends on effective collaboration with experts from diverse fields, emphasizing the importance of teamwork and interdisciplinary cooperation. Flexibility and adaptability are essential when dealing with complex projects, allowing us to adjust to changing requirements and unforeseen challenges. Innovation often faces resistance and setbacks, but persistence and determination are vital for overcoming obstacles and realizing long-term goals. Embracing a culture of continuous learning and improvement enables us to stay abreast of advancements in technology and scientific knowledge, driving innovation and excellence. Clear and open communication fosters collaboration, facilitates problem-solving, and ensures alignment of goals and expectations among team members and stakeholders. Upholding ethical standards and regulatory compliance is non-negotiable, emphasizing the importance of integrity and responsibility in our work. Acknowledging and celebrating achievements, no matter how small, boosts morale and reinforces motivation, fostering a positive team environment. By embracing these lessons, we continue to navigate challenges and pursue our mission with determination, resilience, and a commitment to excellence.

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4. Stories from Croatia

4.1. Manuela Panić

NADES Design

4.1.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

NADES Design (https://nades-design.hr/) comes from the Faculty of Food Technology and Biotechnology that is based at the University of Zagreb. The research team, led by Professor Ivana Radojčić Redovniković, PhD, includes core team members Professors Marina Cvjetko Bubalo, PhD and Assoc. Prof. Kristina Radošević, PhD. They are supported by Postdoc and PhD students Marijan Logarušić, Mia Radović, Martina Bagović, and Anja Damjanović. This team has been working in the field of green chemistry for more than 10 years. To date, their contribution to the academic community includes over 40 research papers, ranking in the top 1% of the most cited works in the green technology category. After years of research and development, an industrial need led us into entrepreneurship, where I, as a postdoc student at the time, took a step into.

Beside the team commitment to the technology development, the key to the start-up success is the existing problem on the market. In our case, petroleum-based solvents are still used worldwide in the industry, and they are responsible for more than 60% of all industrial emissions. The global goal is to find green alternatives for those solvents and reduce CO2 emissions by 2030. That was also our mission. We developed 100% green biosolvents, named NADES solvents. Those solvents are mixtures of at least two natural components and have applications in various industrial fields. After receiving

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our first email from the industry, we enrolled in education at startup incubators. These incubators, in addition to providing education, open the doors to networking and financial support for the further development of our final products.

4.1.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

Continuous financial support for placing the products on shelves, after which we have 2 years to see if our product will fit in the market once it's on the shelves. This phase is crucial as it provides a two-year window to gauge market acceptance and product viability.

The startup journey is a rollercoaster of emotions, involving a lot of pivoting. However, you always have mentors to support you, and somehow you find the motivation and financial support to keep going. Additionally, you should not be afraid of failure because, in the end, only a few research projects will see the light of day on the shelves. A startup should test the product on the market to ensure product-market fit. This step is crucial for determining the viability of a project.

4.1.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

Implied challenges include the need for continuous funding and navigating the emotional rollercoaster of startup life. These were managed through mentorship, financial support, and a resilient mindset. Furthermore, intellectual property (IP) management and ensuring IP security posed significant challenges. To address these, I undertook a year-long study to deepen my understanding of IP issues. We also expanded our support network to include mentors and collaborators specialized in marketing, as well as engaging external production lawyers and patent attorneys to safeguard our innovations. This comprehensive approach allowed us to navigate the obstacles effectively.

Key lessons include the importance of responding to a clear market need, the value of mentorship and community in the startup ecosystem, and the critical role of resilience and adaptability in overcoming challenges.

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4.2. Dario Šuler

OPG Šuler

4.2.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

One successful experience we had was the establishment of our family lavender farm in 2009. Despite facing challenges due to the lack of technology and resources available for lavender farming in our location, we were able to overcome these hurdles. Through efficient workflow management and dedication, we successfully delivered our products to customers after just a few harvests. In early 2020, we expended the family business by focusing on planting an ECO farm of quince. Leveraging our prior experience in agriculture and available mechanization, we applied for an EU-supported project and successfully planted over 1600 trees of ECO quince.

The most important factor that led us to achieve success was our ability to adapt and innovate and our determination to overcome obstacles and take control of our project's fate. Despite facing challenges such as delays caused by a supplier responsible for mounting solar panels and water irrigation systems, we remained proactive and decisive. We recognized the limitations we faced and actively sought out ways to overcome them. This willingness to take charge and address issues head-on ultimately enabled us to move forward and complete the project successfully. By implementing automation and establishing a secure customer base, we were able to build a sustainable business model in an otherwise challenging environment. Help that came from our family members was crucial.

4.2.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself

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successful? How did you deal with the possible lack of motivation along the way?

One significant turning point in our journey occurred when we tragically lost a family member who played a pivotal role in managing various aspects of our lavender farm, from equipment maintenance to organizational tasks. Despite this profound loss, we persevered and rallied together as a family to keep the farm running. This moment marked a transition where we realized the strength of our resilience and determination to overcome adversity, making us consider ourselves successful in navigating through such a challenging period. Another turning point occurred when we finished the paperwork for the EU-supported project. While this administrative milestone may seem mundane, it represented a significant achievement for us, considering the challenges we faced along the way. One notable obstacle was the delay caused by a supplier responsible for mounting solar panels and water irrigation systems. However, rather than allowing this setback to derail our progress, we seized control of the situation by removing the supplier and taking on the installation ourselves. This decisive action marked a pivotal moment where we realized our ability to overcome obstacles and steer our project towards success.

Surprisingly, lack of motivation was not a significant issue for us throughout our journey. Despite facing numerous obstacles and setbacks, our passion for lavender farming and our commitment to honoring our family member's legacy served as constant sources of inspiration. Additionally, the strong sense of purpose and shared responsibility within our family kept us motivated and focused on achieving our goals, even during the toughest times.

4.2.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

One of the primary obstacles we encountered in our successful lavender farming project was the lack of available resources and expertise in our location. As pioneers in our area, we had to rely on our own creativity and ingenuity to overcome this challenge. For example, the absence of existing technology for tasks like pruning lavender flowers prompted us to develop our own solutions, pushing us to become more innovative in our approach. In our successful project of establishing an ECO quince farm, one of the primary obstacles we encountered was the delay caused by a supplier responsible for mounting solar panels and water irrigation systems. Rather than allowing this obstacle to stall our progress, we took proactive measures to address the issue. We made the difficult decision to remove

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the supplier and took on the installation ourselves, demonstrating our ability to adapt and overcome challenges.

Through this process, we learned several important lessons. Firstly, we realized the importance of taking control of our own destiny and not relying solely on external parties. By taking decisive action and assuming responsibility for the installation of critical systems, we were able to keep the project on track and ensure its success. Additionally, this experience reinforced the value of perseverance and adaptability in the face of adversity. Despite encountering setbacks, we remained resilient and flexible, ultimately emerging stronger and more determined to achieve our goals. Additionally, we realized the significance of patience in dealing with both team members and clients. Cultivating patience allowed us to navigate challenges with resilience and understanding, fostering stronger relationships and ultimately contributing to our success in the long run.

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5. Stories from Italy

5.1. Andrea Visioni

Pre-Breeding and Physiology Scientist at ICARDA

5.1.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

One year ago, I was promoted from associate scientist to scientist, and I am now leading my own research group. As I always wanted to work in research, reaching this level represents an important achievement for me.

Without any doubt perseverance was the most important thing that has brought me there. I work in an international and challenging environment and without this quality I would not have reached my goal.

5.1.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself successful? How did you deal with the possible lack of motivation along the way?

In my opinion, beside perseverance there are several factors that contributed to that across the past years like commitment, ability to cope with different kinds of problems and being passionate about my job. I don't have a strategy; any challenge is different from the others and therefore I think that motivation comes any time from different sources.

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5.1.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

I think it is very important to be focused, realistic, able to admit your own mistakes and listen to different opinions and critics. Sometimes it is also very important to restart from scratch if it is needed.

5.2. Maria Itria Ibba

Head of the Grain Quality Laboratory at the International Maize and Wheat Improvement Centre

5.2.1. Can you share a successful experience of yours? What was the most important factor that led you to achieve this success?

Right now, irrespective of the project I am currently engaged in and my scientific journey, I consider my most successful experience having been able to foster an open, collaborative, and "safe" working environment within my immediate team. Leading an established laboratory like the one I am currently overseeing, with predominantly local staff from a cultural and social background different from mine, was initially scary especially because I did not consider having the necessary experience and age to do that.

How did I achieve this? I am still not sure but probably partly what I achieved is thanks to my willingness to listen and embrace everyone's unique approach to work, including my own. There is definitely a lot of room for improvement but right now, I am happy to consider the team I am working with “my” where we all support each other as much as we can.

5.2.2. What was the turning point (achievement, milestone, event, etc.) after a challenging journey that made you consider yourself

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successful? How did you deal with the possible lack of motivation along the way?

I believe that maintaining focus on the final objective is the most crucial factor. Throughout one's professional journey, it's common to encounter various personal and professional challenges that may lead to doubts about continuing one's work. However, when we have a clear goal of where we want to be in the future or the impact, we would like our work to have, enabling you to see the bigger picture, it becomes easier to stay motivated and committed. Undoubtedly, having the support of your team, or at least one team member, is essential and can greatly contribute to sustaining motivation. Furthermore, it's important, yet often difficult, to push ourselves out of our comfort zones. I think it is natural for everyone to become accustomed to routine tasks and processes without considering alternative approaches. Placing ourselves in uncomfortable situations where we may not feel entirely confident in our abilities can be one of the most significant catalysts for change, motivation, and personal growth in my experience. I must admit that in my current role, I rarely find myself bored, as each day presents unexpected challenges and opportunities. Over time, I've learned to view (or at least try to) these challenges positively and embrace them as opportunities for personal and professional development.

5.2.3. Which obstacles did you face in a successful project or goal, and how did you deal with these obstacles? What are some of the most important lessons you learned during this process?

I have encountered several obstacles in different projects, ranging from technical challenges where I had to lead scientific tasks that I didn't feel entirely confident about, to budget limitations. Additionally, navigating meetings and interactions with colleagues can be challenging due to power dynamics, varying interests, and competition, among other factors.

In any case, I believe the most important approach, at least for me, is to tackle problems objectively. When faced with scientific challenges, I begin by working, studying, and consulting with colleagues both within and outside my institution. Accepting that we cannot be experts in everything can be difficult but is essential. When confronted with technical and budgetary constraints, the only recourse is often to minimise unnecessary expenses as much as possible. Dealing with interpersonal challenges is particularly challenging, and I've found it most beneficial to accept criticism without taking it personally and to strive to understand the perspectives of others.

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Moreover, for all these challenges, having a trusted colleague with whom to discuss the normal, continuous challenges one faces is particularly helpful. Some call it a mentor; I would say it's mostly a friend within the working environment. However, I believe it's truly someone external who can provide a more objective opinion of your approach to challenges.

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