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**POTENTIAL PARTNERS FOR THE ESTABLISHMENT AND
DEVELOPMENT OF TECHNOLOGY INCUBATORS IN UKRAINE.
(Strategic partnership structure for the establishment
and operation of technology incubators in Ukraine)**

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Abstract

This article examines the strategic importance of international cooperation in the establishment and development of technology incubators in Ukraine, with particular emphasis on the role of foreign scientific, engineering, and investment partners in strengthening the national innovation ecosystem. The publication analyzes organizational approaches to building international partnerships capable of accelerating the commercialization of innovative technologies and supporting the sustainable development of high-technology enterprises.

Particular attention is devoted to the potential for scientific and technological cooperation between Ukraine and Israel, taking into account the favorable conditions for professional interaction, the common engineering and scientific traditions shared by many specialists, and the opportunities for expanding collaborative research, technology transfer, and joint innovation projects. The article identifies priority technological fields in which international cooperation may produce the greatest practical and economic benefits, including advanced composite materials, superhard materials, electron microscopy, carbon-based engineering materials, and modern agricultural technologies.

The publication further considers the contribution of international experts, research institutions, industrial enterprises, venture investors, and technology commercialization specialists to the successful operation of technology incubators. It emphasizes the importance of integrating global scientific expertise, engineering competencies, and investment resources into the national innovation infrastructure in order to accelerate the development, commercialization, and international competitiveness of advanced technological projects.

Special consideration is also given to the prospects for expanding international cooperation in specialized fields of innovation, including medical technologies, which are recognized as an important area for future research and separate analytical consideration within the broader framework of technology transfer and innovation management.

Keywords: *Technology incubator; Innovation ecosystem; Effective implementation; Innovative development model of industrial and agricultural production; Ecosystem infrastructure framework; Quantum computing; Augmented reality visualization; Testing laboratories; Laws of technical system evolution; Standardization; Technology transfer*

Introduction

The foremost and most important partner is, naturally, people themselves – professionals, innovators, and the initiators of innovative ideas and projects.

The second essential and equally important partner, serving in part as an organizer, is represented by government authorities, local self-government bodies, regional and district administrations, and, where appropriate, legislative authorities.

The third professional partner consists of intellectual property specialists, patent attorneys, registered patent agents, and legal professionals specializing in patent law.

The fourth partner comprises standardization authorities and laboratories, testing and measurement laboratories, state technical supervisory authorities, including industrial and mining safety inspection bodies, and other relevant regulatory organizations.

The fifth partner includes academic and industry-oriented research institutes, universities, higher education institutions, tech-

nical colleges, and other specialized educational and scientific organizations.

The sixth partner consists of established industrial enterprises that have successfully preserved their manufacturing capabilities and maintained their positions in the marketplace.

The seventh partner does not yet fully exist in practice; however, it is expected to become one of the most important participants in the innovation ecosystem. This partner includes venture capital funds and other investment institutions, whose development should be encouraged through appropriate legislative initiatives, as well as systems of financial and tax incentives designed to stimulate investment in innovation.

During the period in which this seventh partner is still being established and developed, there are favorable opportunities to involve comparable international venture capital funds and independent private investors from abroad as participants in this partnership framework.

Figure 1.



Who Should Be Invited to Cooperate in the Organization and Initial Development of Technology Incubators in Ukraine

As announced in February 2011, the visa-free travel agreement between Israel and Ukraine entered into force.

This means that there is no longer a need to spend time and financial resources on obtaining visas, and, when necessary, travel between Ukraine and Israel can take

place as freely as travel within Ukraine itself.

Naturally, this significantly simplifies contacts, including professional cooperation.

Considering that every eighth resident of Israel is Russian-speaking and shares the same technical culture and professional mentality as specialists from Ukraine, it can be concluded that professional cooperation between the two countries has the potential to be exceptionally productive, efficient, and

beneficial, without requiring additional expenditures for interpreters or similar services.

If one analyzes the experience accumulated by Israeli specialists in numerous sectors of industry and agriculture that are also of potential interest to Ukraine, several areas can be identified as being of particular importance and interest, where cooperation could produce the fastest and most significant results.

These include expertise in the development of superhard materials and composites based on such materials, experience in the development and effective application of electron microscopes, expertise in the creation of unique carbon composites and advanced materials, and, finally, Israel's extensive and internationally recognized experience in all areas of agricultural production and animal husbandry.

Medical technologies constitute a separate and particularly important area of the innovation process. It would therefore be appropriate to return to this subject and consid-

er the experience of their development and implementation in a separate publication.

Figure 2.

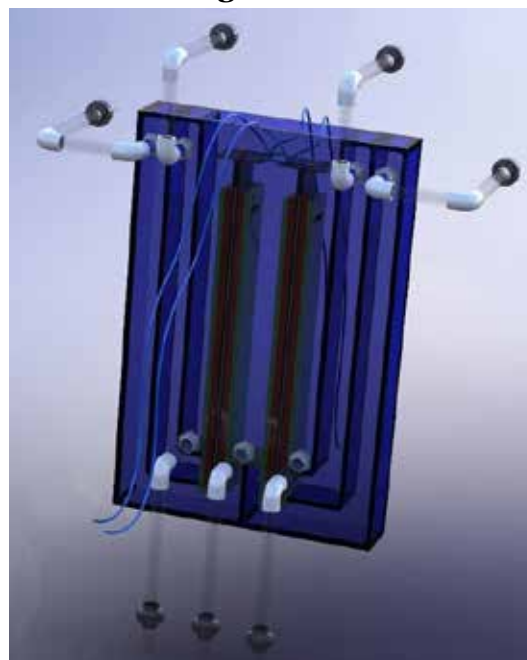
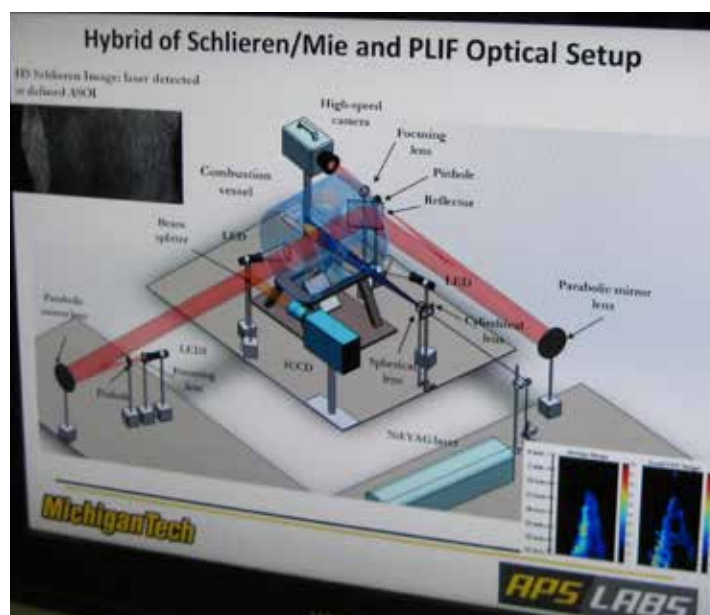


Figure 3.



Inventions Opening an Innovative Scientific and Technical Service Direction for the Visualization of Augmented Reality and Its Wide-Scale Application

Augmented reality technologies for consumer and personal optical devices are still in the early stages of development. However, considering the possibilities for both horizontal and vertical integration of these technologies and their derivatives into personal

and public infrastructure, they are expected to have a significant future.

Headsets utilizing the above-mentioned augmented reality technologies, as well as their initial applications and combinations, are currently relatively expensive, and wearing them throughout the day remains inconvenient. Nevertheless, the predicted and anticipated growth of consumer interest in these groups of technologies and their com-

binations makes it necessary to conduct an active analytical review of this field.

Since the service and operational aspects of products based on these and similar groups of technologies, together with the various innovative technical solutions associated with them, have not yet been adequately addressed, the author of this article, drawing upon personal experience in organizing service support for various consumer and personal optical applications, considers it appropriate to propose several ideas and recommendations in this area.

Augmented reality (AR) is understood as the technology of superimposing virtual objects onto a person's view of the real world.

The most common consumer applications of this technology are AR browsers and AR glasses.

In AR browsers, virtual objects are superimposed onto images captured by a smartphone or tablet camera, while in AR glasses they are projected onto a lens or displayed on a miniature monitor.

Specialists and experts continue to analyze the prospects for the commercial success of products based on these technologies when introduced to the market. During these discussions, a number of interesting details and circumstances have emerged, the proper understanding of which may provide practical assistance in achieving comprehensive positive results.

A considerable amount of time has passed since the release of the first relatively successful augmented reality glasses project; however, there is still no clear understanding of what the optimal design version of such glasses should be.

From the very first moments of use, these glasses created a growing sense of uncertainty regarding their role and their potential influence on increasing commercial activity within the market for similar products. Despite all expectations, after users had sufficient time to learn how to use the new device effectively and their initial enthusiasm had diminished, interest gradually declined, while a clear understanding of the reasons for this situation failed to emerge.

The fact remains that throughout this period developers have been unable to transform augmented reality glasses into a device

as familiar and indispensable as a smartphone, a gaming console, or a smartwatch.

In the author's opinion, one of the reasons for this situation is the current state of service technologies, which are not yet prepared to support such complex devices under conditions of mass production and widespread consumer use.

Today, one of the principal indicators of both public interest in and the relevance of this technology is the current state of patent protection relating to these emerging technologies, which, upon closer examination, raises numerous questions.

It is surprising that, despite the fact that augmented reality visualization projects and technologies, both independently and in combination with related technologies, have the potential – through integration with existing digital technologies – to create entirely new technological fields and promise rapid growth in market demand, the pace of patent protection remains relatively slow and limited.

During a patent search conducted by the author using keywords in the database of the United States Patent and Trademark Office (USPTO), only 133 patent applications were identified, while no issued patents were found on this subject:

- **Glasses of additional reality** – only 113 patent applications were registered.
- **Visualization of additional reality** – only 20 patent applications were registered.

An initial analysis of the published patent applications demonstrated that all of these applications are exploratory in nature and do not focus on the design and systems of augmented reality glasses as mature commercial products. Furthermore, all of the examples relate to products that remain at the final stages of development, indicating a genuine lack of practical experience in servicing and operating such devices.

Since the author of this series of publications is engaged in the practical implementation of these products within a specific market, it is evident that, at the present stage, numerous technical solutions and supporting tools required for their successful commercialization are still lacking. Among the first

priorities are technical solutions and products intended to support the everyday use of augmented reality glasses, including technologies for cleaning the lenses from unavoidable contamination arising during normal use, whether of organic or inorganic origin.

Since the lenses of augmented reality glasses become contaminated in much the

same way as those of conventional eyewear, from a practical perspective one of the first priorities should be the development of an integrated technology for producing cleaning and disinfecting solutions using water that does not contain high concentrations of dissolved salts, including hardness salts.

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