



UKRAINIAN
CLUSTER
ALLIANCE

DIHS NETWORK IN UKRAINE

DEVELOPMENT OF INSTITUTIONS
INNOVATIVE ECOSYSTEM
HI-TECH INDUSTRY SECTORS

POSITION PAPER

Development of hi-tech industry sectors'
innovative ecosystem institutions

DIHs network in Ukraine

POSITION PAPER

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Executive summary

DIHs (Digital Innovation Hubs) are a key element of the EU innovation infrastructure for accelerating digital transformation among Small and Medium Enterprises (hereinafter referred to as SMEs). There are more than 600 DIHs in Europe, which play a very important role in supporting SMEs, providing market enlightenment, development of innovation ecosystems, testing, transfer and fundraising of innovations and improving skills and knowledge of SMEs. Since 2014, hundreds of thousands of European SMEs and startups have received support from DIHs network and significantly improved their level of readiness for digital transformation.

Considering the role and importance of DIHs for achieving ambitious goals for the digital transformation of the business environment, the EU in 2022 supported creation of the European Digital Innovation Hubs¹ (EDIHs) network, which became the next stage of DIH development and received the value of funding on parity terms (50*50) from programs of Digital Europe and national governments of the EU countries. According to preliminary data, it is expected that a targeted competition will be announced in 2024 for inclusion of Ukraine in the EDIH network, but this requires appropriate changes in the country's digital innovation policy and an increase in readiness of Ukrainian organizations to meet high requirements regarding the level of EDIH services.

Unfortunately, the situation in Ukraine regarding support of the DIH network is radically different compared to the policy of the EU countries. There are only 5 registered Ukrainian DIHs² on the European S3 platform of smart specialization, but even these initiatives to create and develop digital hubs to support SMEs do not yet have any significant support from international or State organizations. Accordingly, real assistance to SMEs, according to the [Ukrainian Cluster Alliance](#) (UCA) data, is provided on a regular basis by 2 DIHs only. Meanwhile, hundreds and thousands of SMEs from real sectors of the economy are in dire need of implementing the above-mentioned roles in their region and - or industry. Without such support, Ukraine is doomed to remain a raw material country.

So, how do you start a network of DIHs in Ukraine? In this position paper, UCA experts analyze the current state and challenges of DIHs' development in Ukraine and offer a holistic concept and recommendations for the DIHs network development.

UCA positions the network of DIHs on the same level as innovation clusters, as two key elements in development of regional and industry innovation ecosystems. It is these 2 network structures that are the main ones for accepting the challenges of the twin (green and digital) transition of SMEs. UCA emphasizes that without accepting these challenges, degradation and lagging of Ukrainian SMEs from the European ones will grow.

The concept of UCA offers a holistic, systemic and long-term approach to building a network of DIHs in Ukraine. The document outlines the main principles of forming a network of digital innovation hubs, the first steps in creation of individual hubs, quantitative and qualitative indicators of their activity. The document also offers specific services of

¹ <https://european-digital-innovation-hubs.ec.europa.eu/home>

² <https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>

UCA to support creation and functioning of DIHs. This concept is based mainly on the 5-year experience of building Industry 4.0 Centers in Ukraine and supporting several DIHs by the [Association of Industrial Automation Enterprises of Ukraine](#), UCA co-founder, and is coordinated with other UCA participants, including the active DIHs of Kyiv.

UCA's recommendations in this Position paper are aimed at solving the issues of institutional recognition of DIHs, creating a targeted support program, studying the best European experience and strengthening the role of local self-government bodies.

This proposal of the Ukrainian Cluster Alliance is intended mainly for responsible departments of central and regional authorities, local self-government bodies, international partners, regional clusters and industry business associations. It will also be interesting and useful for wide circles of experts and the public, and those interested in innovative and industrial development of SMEs.

1. Why Small and Medium Enterprises need digital transformation support centers

Small and medium-sized enterprises (SMEs) dominate the European economy in terms of number of enterprises, jobs created, diversification, exports, etc. At the same time, the competitiveness of the EU economy is determined by the pace of innovation, and where in the era of the 4th industrial revolution, **digital transformation is the main direction of innovative changes**. Since the end of the 2000s, the EU has started implementing policies and programs to support SMEs, guided by their needs. It is obvious that SMEs usually lack resources, knowledge, competences and experience to follow innovative changes, from technology to changing business models.

For example, in Ukraine there is still no developed support network for industrial SMEs in the field of digital transformations. Mass deindustrialization, which led to reduction in the share of industry in GDP by almost 2 times (from 17% in 2003 to 9.5% in 2021), affected not only large enterprises, but mainly small and medium ones. The loss of jobs in almost all production sectors and regions was a consequence of the migration of labor resources from the country abroad and to other industries, the growth of unemployment, high dependence on imports, and most importantly, **the loss of technological potential**. According to the UNIDO Industrial Competitiveness Index, in 2018, Ukraine ranked 69th in the world among 152 countries, having lost 17 positions since 2010, and being 2-3 times behind its neighbors from the east and the west. The consequence of all this in 2022 was the complete inability of the country to switch to the needs of the military industrial complex to protect the country from the Russian aggressor. This dependence on Western supplies remains critical in 2023.

Our neighbors, like Poland, have many times better indicators of SME development not only because of better investment attraction policies, rule of law or economic freedoms, which Ukrainian experts, politicians or civil society representatives from the liberal wing constantly talk about. Poles constantly care about **the quality and balance of tools and institutions of industrial and innovative development** and how to adapt them to the challenges of the twin green ND digital transition. There are many times more of these support tools in Poland than in Ukraine, and they are of much higher quality, which is why SMEs have better opportunities for innovative development.

With the beginning of the war, the situation in Ukraine in the field of production sectors became even worse. A May 2023 [study by the Institute for Economic Research and Policy Consulting](#) (Figure 1) points to a drop in demand for innovation in industry and numerous export challenges faced by most SMEs. This means that the lag behind Ukrainian SMEs from European ones, which UCA experts have ascertained in previous years, is **growing**.

Main results



Fig. 1 The main results of the survey of SMEs by the Institute of Economic Research and Political Consultations in the spring of 2023 ([source](#)).

Accordingly, the following issues are critical for SMEs in the field of innovative development:

- **Consulting support:** where and how to get consulting support for maturity level and the first steps in the twin transition, or separately, in green or digital transformation.
- **Larger and more efficient use of innovation grant support mechanism:** there are many grants and very different ones, but usually all SMEs lack orientation, understanding and, ultimately, help in writing grant applications, and this is especially critical for European programs where competition is very high. At the same time, SMEs do not have their own resources.
- **Access to modern laboratories and testing:** one of the main obstacles in any technological innovation is the risk and fear of making the wrong choice and investing in the wrong technology. Accordingly, SMEs want to see, and even better try, how an innovation works in laboratory conditions before investing in it.
- **Access to a network of experts:** in manufacturing sectors, SMEs are also very sensitive to the level of expertise of contractors and external experts. Whether this access is better or a larger network of experts (different technologies and sectors), the faster SMEs overcome obstacles in innovative technologies.
- **Staff training:** low skills of own staff is one of the main obstacles on the way to innovation. Accordingly, SMEs need training centers based on new technologies, and preferably in different formats and different levels of complexity.

- Changing legislative field – **stimulating innovative development of SMEs**: after all, many SMEs are used to competing on the basis of price, and therefore additional efforts and incentives are needed for innovating.

EU and world developed countries quickly came to the conclusion that most of these functions can be provided by specialized support centers. DIHs (Digital Innovation Hubs) – digital innovation hubs have become such centers in the EU.

2. DIHs as the main instrument in supporting digital innovation of SMEs in the European Union

Digital Innovation Hubs (DIHs) can be considered one of the main tools for supporting small and medium-sized enterprises (SMEs) in the field of digital innovation in the European Union (EU). Digital innovation hubs are part of the EU initiatives "Digital Europe" and "Horizon Europe" aimed at promoting digital technologies and innovations in Europe and specifically to support SMEs. The main tasks of DIHs are to support SMEs in implementation of digital technologies and help them achieve competitive advantages. They help SMEs integrate and apply advanced digital solutions of Industry 4.0-5.0, such as artificial intelligence, Internet of Things (IoT), blockchain, digital twins, additive technologies, etc., to improve their business processes and develop new products and services.

The main functions of Digital Innovation Hubs are within the following main roles:

- **Market education:** DIHs actively promote digital technologies and innovation among SMEs by organizing webinars, seminars, trainings and conferences.
- **Ecosystem development:** DIHs help SMEs to find partners and create cooperation networks with other enterprises, universities, research centers and authorities.
- **Testing and Validation:** DIHs provide access to laboratories and infrastructure to test and validate new innovative products and ambassadors.
- **Staff training from SMEs:** DIHs provide SMEs with specialist advice and training programs to help them understand and apply digital technologies in their operations.
- **Innovative fundraising:** DIHs actively involve SMEs in existing EU grant programs, of which there are many both at the pan-European level and at the level of individual countries. Many hubs provide SMEs with financial support in the form of grants or other financial measures for development of digital innovation.

Since 2014, more than 600 active DIHs have been established in the EU. In 2020, APPAU conducted benchmarking for some of them, see [the description of the Hungarian PBN case](#) (Fig. 2). It follows that from 2019 to 2020, this DIH conducted more than 70 grant projects, held 59 trainings attended by more than 3,000 people from SMEs, organized dozens of visits by hundreds of SMEs to its laboratories. There are dozens and hundreds of such hubs in European countries – actually, why we talk about DIH not only as a tool of innovative policies, but also as a **network institution**. Together, the hubs create a powerful cumulative effect on thousands of SMEs and, thus, their transition to a new phase of development.

3. State and challenges in Ukraine

The first DIH was registered in Ukraine in 2017 on the basis of the Lviv Polytechnic National University as part of a grant project supported by the I4MS initiative. Lviv Polytechnic University, Civitta and NGO Agency of European Innovations became members of the consortium. The I4MS initiative is part of the Horizon 2020 program, and it was I4MS that initiated the creation of the first pilot DIHs in Europe and, with the participation of leading EU innovation structures, developed the methodology and procedures of DIHs.

The Lviv project was successfully implemented and could become a canvas for multiplication of new experience in Ukraine. However, in the future, the Lviv DIH could not reach the level of performance of the above-mentioned roles of European DIHs. The main reasons were the institutional weakness of the structure, the lack of support at the national and regional level, including financing, and the low level of demand from production ecosystems.

In 2018, APPAU released the concept of [Centers of Industry 4.0](#), very similar to DIH, in particular in the functions of education and enlightenment of SMEs, development of regional ecosystems, testing and innovative fundraising. Over the next 3 years, Centers 4.0 were opened in Odesa, Kharkiv, Kyiv and Poltava. The first center in Odesa in 2018 was equipped with various types of modern automation and robotics equipment, a significant amount of which was donated as sponsorship from APPAU members. In 2020 the concept of centers 4.0 was supported by the Resolution of the Cabinet of Ministers of Ukraine of July 21, 2021 No. 750 "On promoting implementation of the technological approach "Industry 4.0" in Ukraine"³

All these centers exist to this day, but they have not moved into a systematic and full-scale activity of performing the aforementioned roles of DIHs. At the same time, it is worth noting that each of the above-mentioned centers performed from 2 to 4 roles, albeit with very different volumes and levels of support to SMEs.

³ <https://zakon.rada.gov.ua/laws/show/750-2021-%D0%BF#Text>



Fig. 3 Photos of participants from the opening of Center 4.0 in Kharkiv, 2018 ([full report](#))

In general, during the 3 years of deployment of the network, APPAU assessed this experience as very controversial. Despite the efforts of the association and individual departments, the 4.0 Centers did not gain significant support even in their own universities and did not achieve their goals in supporting SMEs. In particular, with the exception of Poltava, they failed to create dedicated units that would take responsibility for innovation support programs for SMEs. Since the beginning of 2020, APPAU is looking for a way out of this impasse and is returning to considering capabilities of the DIHs network. APPAU notes with surprise that the network of European DIHs is open to Ukrainian organizations, although until this period there was a widespread opinion in the APPAU and Ukrainian Industry 4.0 community that this network is available only to EU countries. It is important to note that no promotion of European DIHs, proposals for their development in Ukraine by state structures was recorded at that time. This may mean that the issue of supporting SMEs in digital transformation, coordination of strategic positions with the EU was not considered at all by state structures. In fact, **Ukraine lost at least 6 years in supporting innovative development by DIHs channels, as one of the most important element in industrial ecosystems.**

In 2020-21, 2 DIHs were opened in Kyiv – "Centre 4.0 of the Igor Sikorsky Kyiv Polytechnic Institute" ([Centre 4.0 DIH KPI](#)) on the basis of Center 4.0 KPI and "Virtual Center of Digital

Innovations" ([NOSC-UA DIH](#)) at the Kyiv Academic University (KAU), which unites a number of research institutes of the National Academy of Sciences of Ukraine.

The BOWI project, which was implemented in DIH of KPI together with APPAU in 2021-23, became a turning point for the system launch of a full package of DIHs functions. Over the past 2 years, the partners have completed the following scope of work:

- **Market education:** more than 40 educational webinars and 4 brokerage events were held.
- **Consulting for SMEs:** in total, about 100 SMEs were served in the ecosystem, 40 of them were provided with individual services.
- **Innovative fundraising:** the EIF APPAU program (in which experts from 2 Kyiv DIHs were involved) brought more than 1 million euros to 14 Ukrainian organizations in 2022 (full report [here](#)).
- **Staff training:** there were no major changes here, but other partners and experts in the APPAU ecosystem (in particular, the National University of Food Technologies specialists) continued to provide training for SMEs on a commercial basis.



Fig. 4 Photo of the final meeting of the participants of the EIF APPAU program, which was carried out together with 2 Kyiv DIHs ([full report](#))

It is worth noting that DIHs experts were trained in the BOWI project and improved their skills in both innovation management and SME service functions.

At the same time, in the opinion of APPAU, NOSC-UA DIH looks more promising – precisely because of the fact that it acts as an independent, targeted structure, fully focused on the implementation and support of innovative projects for SMEs.

According to this experience, the main challenges in strengthening and expanding the network of Ukrainian DIHs are:

1. **Creation and financing of independent, dedicated structures that full-time perform the relevant roles and functions of DIHs.** At the moment, this is the main obstacle in most cases, since the above-mentioned DIHs, and especially those based on technical universities, were created as volunteer structures, have no regular management and practically no external funding.
2. **Infrastructure, in particular, modern laboratories.** Most centers are unable to fulfill the role of 'Test before invest' DIHs because university laboratories are outdated, have limited access and are also not intended for collective use. As for other Centers for the collective support of SMEs in digital transformation outside universities, these are currently unknown to the authors of the document.
3. **Low level of innovative management.** Most of the centers that are created on the basis of universities lack modern, innovative management that would think and act in the paradigms of service, client-centric organizations, really oriented to broad promotion of new technologies and the involvement of hundreds of SMEs. As an example, attempts to create regional innovation landscapes in Kharkiv and Zaporizhzhia with the help of local university communities ended unsuccessfully for this very reason.
4. **Low level of integration with SMEs in real sectors of the economy.** Typically, university-based DIHs do not have experience in broadly involving SMEs, building broad ecosystems and promoting innovation among them.
5. **Low demand and low level of innovative culture among SMEs.** This is another big challenge, which is especially acute after the start of the full scale war. According to surveys and the experience of several leading business associations and analytical agencies, innovation recedes far into the background in the priorities of industrialists. Therefore, the lagging of traditional industrial sectors from Western markets is only growing.

The experience of APPAU and later (from 2022) UCA in interaction with 2 Kyiv DIHs is quite positive. In particular, we saw that with joint efforts we can overcome challenges 3-5, indicated above. However, everything related to serious financing of structures, creation of new laboratories requires other, much more systematic and large-scale approaches. The experience of the [Tech Startup School](#) in Lviv is interesting in this context. Although this organization does not have the status of DIH, it actually fulfills **leadership roles and functions in creation and development of the regional innovation ecosystem**, innovation fundraising and where several modern laboratories have been established in the

last 3 years. It is important to note that this organization uses not only grants from international organizations, but also sources of local budgets and the fact that it was created on the basis of a technical university. To a large extent, this is an answer to the objections of skeptics who believe that innovative structures cannot be created on the basis of state higher education institutions. The position of UCA is different – everything depends on the leadership of managers and proper management. These factors are decisive, including for search and launch of appropriate financing mechanisms.



Fig. 5 Visit to the bio-engineering laboratory of the Lviv School of Startups by participants of the "Sustainable Regional Development" conference in June 2023 ([full report](#))

From the point of view of institutional support of the authorities, the only concrete result in the creation of Support Centers for the digitization of SMEs is Resolution [No. 750 on "Industry 4.0 Centers in Ukraine"](#), prepared by the Ministry of Economy in 2021 and approved by the Cabinet of Ministers of Ukraine. In the same year, the Ministry of Economy also tried to include the financing of Centers 4.0 in the state budget, but it was not possible to achieve this. Thus, **neither Industry 4.0 Centers nor existing Ukrainian DIHs had any state funding for all previous years, and it amounted to no more than 400,000 euros from European funds.** For comparison: [the total amount of financing of the European network of EDIHs from 2021 to 2023](#) is 329 million euros.

4. DIHs concept from the Ukrainian Cluster Alliance

Taking into account previous experience, how should a network of modern effective DIHs be created and developed in Ukraine? Below is a concept from the Ukrainian Cluster Alliance, including partner DIHs. This concept de facto outlines the framework of the target model for a 3-year period.

4.1 The main principles in creation of DIH at the national and regional levels

The network of DIHs in Ukraine should develop on the following principles:

1. **Strategic positioning**: the network of DIHs should become one of **the key institutions in the implementation of the twin green and digital transition strategy in Ukraine**. It should be supported by state policies and programs at both the national and regional levels, which include specific mechanisms and tools (for example, as a target program for development of DIHs, approved by the Cabinet of Ministers of Ukraine and which European countries have).
2. **Support of key regional-industry stakeholders**: at the regional level, DIH is created and supported by key stakeholders interested in development of innovation ecosystems, which may include local government, university(ies), development agency, clusters, and other actors. Support tools can be different, for example, from local government, it can be financial incentives, such as use of local government public budget, vouchers for regional innovators (like Lviv Regional State Administration does), long-term lease of municipal premises, attraction of international aid from sister cities from the EU, etc.
3. **Clear specialization according to the priorities of regional smart specialization and better competences**: each DIH develops its clear sectoral and technological specialization and corresponding assets, support programs and services for SMEs: access to laboratories, educational programs and trainings for SMEs, incubation and acceleration programs, services on innovative fundraising, etc.
4. **Ecosystem cooperation as a key success factor**: individual assets and services, and especially at the initial stage, together with key actors of innovative development DIHs create leading universities, industry associations and regional clusters, development agencies and communities.
5. **Mandatory public funding**: the main sources of funding and development of DIHs are local budgets, grants from international organizations, regional development funds, specialized funds and EU programs, sponsorship contributions from large enterprises, and other public and private funds.

4.2 Key performance indicators of DIHs

Activities of Support Centers, their effectiveness is measured by indicators that are most relevant to their key roles. For 3-year DIHs (as a period of reaching threshold of self-sufficiency of individual services), UCA considers the following performance indicators appropriate:

- **Market education:**
 - Short-term events for SMEs (seminars, webinars) – at least 1 per month, total – 12 per year.
 - Holding Technological and Innovation days: at least 2 per year.
 - Total number of SMEs involved in the events: at least 200 per year.
- **Personnel training (reskilling-upskilling):**
 - Short-term trainings (1-2 days): at least 1 per quarter (4 in total per year).
 - Training programs (several weeks or months): 1-2 per year.
- **Access to laboratories, testing:**
 - Visiting DIHs laboratories: at least 50 SMEs per year.
 - Testing, experiments: at least 10 SMEs per year.
- **Consultations for SMEs** (individual consultations on the development of innovations, preparation of technical assignments, grants, etc.):
 - Number of involved SMEs: at least 50 per year.
- **Innovative fundraising and brokerage:**
 - Organization of innovative competitions: at least 1 per year.
 - SME access to innovative, grant funding: at least 20 SMEs, as well as other organizations with total potential volumes of **1 million euros per year**.

These indicators take into account the previous experience of cooperation of DIHs with UCA clusters and, in particular, the fact that some of the specified roles are performed by DIHs together with partners. For example, regional innovation clusters, which are the closest partners of DIHs, are traditionally responsible for attracting SMEs to events, fig. 6.

Participation of countries (BOWI in numbers)

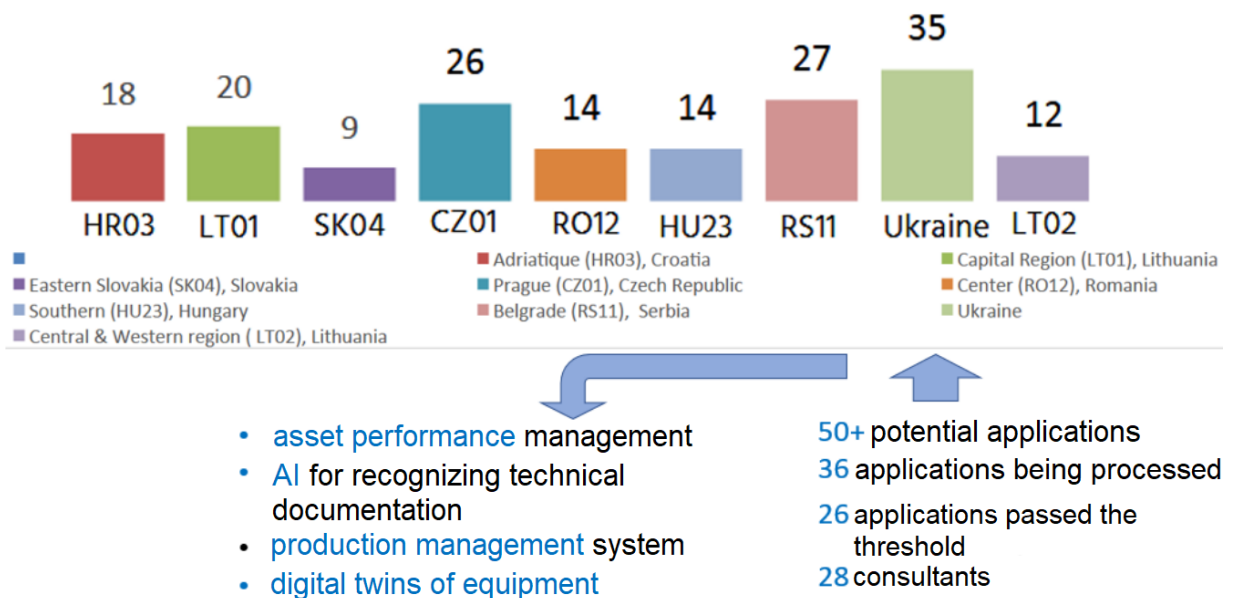


Fig. 6 Ukrainian DIH "Center 4.0 Sikorsky KPI" had the best results in the innovation competition in January 2022 among the participants of the BOWI project – a total of 55 SMEs were involved in the competition, 35 of which were registered on the competition platform. The involvement of SMEs was carried out jointly with APPAU.

The total number of valid DIHs in Ukraine in 2025 should reach at least 10.

4.3 The main steps in creating new DIHs

To create new DIHs, UCA recommends the following 5 steps:

1. **Initiation and consolidation of key actors.** Initiative group proposes a concept for creating a DIH, involves key actors of innovative development, including local authorities, leading universities, clusters and/or leading industry associations. The parties must clearly agree on terms of cooperation and contribution of each participant.
2. **Registration on the European smart specialization platform.** This step is free, but important from the point of view of obtaining status and further interaction both in Ukraine and in the EU.
3. **Creating a project team and attracting funding.** Launching a full-fledged DIHs costs at least 1 million euros. Therefore, launch of DIH is considered as a target project at a regional level with gradual and planned funding.

4. **From the very beginning, DIH has a dedicated team**, which at the initial stage has 2 main missions: attracting funds and providing services to SMEs in the volumes allowed by the configuration of joint assets of partners, project participants.
5. **Entry into European projects**. This step is obvious both from the point of view of funding advantages (in the EU there are many programs and projects that support DIH), and from the point of view of gaining experience.

4.4. Services and support from the Ukrainian Cluster Alliance

Executive Directorate, Project Office, Resource Centers and Committees of the UCA, innovation clusters of UCA are ready to support creation of DIHs at the regional and industry level with the following services:

- Assist in conceptualizing and determining the correct configuration of DIHs at the local level.
- Registration on the European platform, including creation of a site, definition and description of the service package, etc., which are necessary for validation.
- Incorporation of the existing services of UCA on enlightenment and education of SMEs, with transfer of experience to the local level.
- Connecting with leading European partners who support creation of DIHs and joint search for funding.

For existing DIHs, UCA continues to provide services both in development of regional innovation ecosystems and innovative fundraising.

Thus, UCA positions itself as an important institutional partner of the DIHs network. Together, clusters and support centers are positioned in the UCA strategy as 2 key institutions in the twin green and digital transition of domestic SMEs. At the same time, the DIHs network has a clear mission to support and serve SMEs within the framework of development of innovative ecosystems at the regional or industry level.



Fig. 7 Photo of the signatories of the [Industry 5.0 Manifesto](#) at the 1st conference on Industry 5.0, organized by APPAU. The manifesto was signed by 36 participants, including 2 DIHs and 25 UCA clusters ([full report of the conference](#))

UCA partners agree that a network of DIHs, or even a single DIH, cannot be launched by a single organization, and our experience since 2018 shows this. Cooperation and consolidation is the #1 factor in success of this initiative.

4.5. Key expectations from state structures, local governments and international donors

In the conditions of a sharp drop in the demand for innovation, UCA notes a significant lack of effective structures and support centers at the level of most industrial sectors, capable of supporting this demand through proactive education and market enlightenment, launching new development projects, strengthening capacity of SMEs, etc. Existing initiatives such as Action.Business or Action.Education have little in common with the requirements and needs specified in point 1.

The main gaps in the existing formats of SME support in Ukraine:

- 1) **Lack of qualified personnel, i.e. specialists** who are deep in the topic of modern technologies of Industry 4.0-5.0 and are able to serve the requests of dozens, hundreds of SMEs "on the fly".
- 2) **Lack of appropriate infrastructure.** Support centers for industrial SMEs should provide physical infrastructure, including for demonstration and testing of innovations.

Accordingly, the main expectations for state structures and local self-government bodies relate to changing approaches to development of modern innovation ecosystems at the level of regions and industries. They should realize the current state of increasing lagging of domestic SMEs from the demands of global markets, recognize the need to create modern support centers as a priority and make appropriate changes in their own strategies and plans.

As for international donors, UCA's expectations also relate to a change in attitude and a better understanding of the challenges of real economic sectors in Ukraine. Observing for 5+ years numerous projects of launching innovative startups, we are forced to talk about their low efficiency in solving the problems of innovative development of key industries and sectors of the country's economy. Donors should change their emphasis and priorities:

- From exceptional focus on startups to creation of demand and development of the culture of end customers, primarily industrial SMEs.
- From weak and short-term financing of individual economic entities to medium-term (3-5 years) programs for creation and development of powerful network institutions
- From financing mainly trainings on skill development to understanding that it is necessary to finance payment of such centers' management and leading experts, as well as infrastructure.

Without these changes in approaches, it is futile to hope for significant changes in creation and development of a network of SME support centers as a new strong institution capable of changing the course of events.

5. Main recommendations and proposals for DIHs network development

So, if Ukrainian SMEs really need a whole range of support functions, these needs became even more acute during the war, and the solution is to create appropriate Support Centers, then how to speed up their creation and deployment at the level of different regions and sectors of the economy?

UCA offers the following:

1. **Institutional recognition:** DIHs or similar centers, with similar functionality, should be recognized by key stakeholders, primarily by state structures, as key elements of innovative regional and sectoral innovation ecosystems. In practice, this recognition includes, but is not limited to:
 - a. Legislative consolidation of the role of DIHs at the level of relevant state development strategies and adoption of normative legal acts on the status of DIHs by the Cabinet of Ministers of Ukraine.
 - b. Inclusion of DIHs as mandatory subjects of development of innovative ecosystems at the regional level in regional development plans and strategies of regional authorities.
 - c. Similar positions regarding the roles and positioning of DIHs should be developed at the level of other important categories of regional ecosystem participants — local self-government bodies, representatives of the scientific and educational sphere (universities and research institutes) and clusters.
2. **Targeted development program from the Cabinet of Ministers:** The Ministry of Economy or the Ministry of Digital Transformation, which by their status and distribution of roles in the current state of the Cabinet are closest to the issue of DIHs, must adopt a targeted program for development of DIHs in Ukraine, for at least 5 years and with an appropriate budget and in accordance with the plans for integration into the European network.
3. **Solving the dilemma "University (research institute) or a separate, third-party public organization."** UCA states that the trend of "leaving the orbit" of influence and attachment to universities or scientific research institutes is really intensifying in Ukraine, and not only because of the problem of access to highly qualified experts, ready-made educational programs and laboratories. The priority is the problem of innovative management and lack of leadership on the part of these institutions. If universities seek to maintain their influence on business, and in particular, development of SMEs, they must become much more flexible, faster and accept the rules of the market, in particular in cases of creation of DIHs on their base:
 - a. From the very beginning, create SME Support Centers as dedicated structures, with dedicated staff and an appropriate staff budget.

- b. Conduct an audit of innovation potential and existing innovations with a clear definition of the strongest points, potential and assets available to support SMEs.
 - c. Solve the problem of communications with the market by appointing appropriate managers.
- 4. **Study and dissemination of best practices:** the Board recommends to all experts of the Resource Centers and Committees of UCA to pay special attention to the experience of DIH and e-DIH from our European partners. This experience needs to be learned, disseminated and implemented at the level of your region and/or industry, while improving the existing Support Centers. If the DIHs network is the closest institutional partner (= twin) of the clusters in the development of innovative ecosystems in production sectors, and the clusters really realize that they cannot cope with the challenges of the twin transition by themselves, then they should do everything to ensure that powerful effective DIHs appear in their region. In turn, UCA Board and Executive Directorate of plan to continue to actively interact with the existing DIHs and popularize the best experience of cooperation.
- 5. **Strengthening the roles of local governments and communities:** local self-government bodies, united territorial communities in regions with a high concentration of manufacturing SMEs, regional development agencies should pay attention to DIHs as strategic partners in development of innovation and potential of SMEs in their region. Accordingly, UCA recommends to significantly strengthen influence and, in some cases, to take the lead over the processes of creation and development of DIHs by:
 - a. Attracting donor funding to create SME support centers for digital and green transformations.
 - b. Developing own policies and proposals for stimulating development of DIHs, including by providing fiscal or other benefits to DIHs organizers, allocation of necessary premises, budget for personnel payments, integration of existing tools into them (startup support, innovation vouchers, etc.).

UCA separately appeals to international donors and the European Commission to take these recommendations into account in the plans for support and development of DIHs in Ukraine. Domestic industrial ecosystems need a network of SME Support Centers in the twin transition on a permanent basis. This need is critical and applies not only to future Recovery programs, but also to the current Wartime Resilience phase of our industrial ecosystems.

Ukrainian SMEs cannot be successfully integrated into European chains and ecosystems without alignment in the basic standards and requirements of the twin transition

Accordingly, any donor projects should take into account the real state and challenges of the development of DIHs and other support centers, which are described in this document. At the same time, we draw attention to certain controversial or even negative experiences of the

past years, when individual donor programs were deployed in Ukraine with results that were incomprehensible to the business community. In particular, this applies to Eastern Partnership programs. Donors should significantly improve interaction and take into account positions of leading business associations and promote transfer of strategic development programs to the government level. In turn, the government should regularly report on implementation of international technical assistance programs and do so through more open, transparent communications with the business community and the public.

For its part, UCA, as the leading association of clusters of Ukraine, will continue to support and promote development of DIHs in Ukraine by all possible means available to us. We believe in strength and prospects of our SMEs, cluster participants, their potential, creativity and innovation and will do everything to make their support more and more effective.

UCA is your reliable partner in development of innovative ecosystems in real economy sectors

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