



digital success
programme

DIGITAL EXPORT DEVELOPMENT

STRATEGY OF HUNGARY

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1 Greeting

I am convinced that digital transformation is not primarily an information technological, business or political issue but an overall social phenomenon which irrevocably changes people's lives, the operation of businesses, and the organisation of public administration. Digitalisation is not a matter of choice, in fact, it is a process that inevitably determines our existence, not only changing our everyday lives but also affecting each and every industry.

In Hungary, the digital economy makes up 20% of the gross value added (GVA) of the national economy as a whole and provides work to nearly 15% of all employees. (IVSZ-Századvég, 2015). Regarding the weight of the digital economy within the national economy, Hungary is among the leaders in the European Union, and our advantage can be further increased with targeted measures. However, it can also fade away as there is an enormous fight going on in our world for the resources of the digital economy, i.e. for qualified professionals.

Therefore, the digital economy has the potential of becoming a breakout point for Hungary's national economy, so it is of key importance to carry out well-thought-out developments in all areas such as startups, ICT companies, etc. The citizens' will expressed during the national consultation of 2015 on the internet and on digital developments initiated by the Government (InternetKon) confirmed this recognition, because the citizens gave a clear and unanimous reply to the question whether the digital development of domestic businesses should be supported as a priority issue.

The Government has prepared the Digital Success Programme aimed at the digital development of the Hungarian society and the Hungarian national economy based on the results of the InternetKon survey. The Digital Export Development Strategy of Hungary, which was drawn up as part the Programme, defines a comprehensive governmental package of measures designed to improve the export capacities of SMEs engaged in IT services.

The Digital Export Development Strategy of Hungary aims to use development policy tools with a view to achieving an intensive growth in the export of digital products of high added value. The development of the export performance of the digital economy can largely contribute to the growth of the Hungarian economy, create a number of attractive jobs of high added value also for youths, boost domestic digital innovation, and improve Hungary's international recognition through the utilisation of Hungarian know-how and innovation.

Another objective of the Digital Export Development Strategy of Hungary is to develop a strong digitalisation knowledge in Hungary.

Overall, the implementation of the strategy will contribute to making Hungary the beneficiary of digitalisation and a winner on the newly emerging stage of the international division of labour.

dr. Tamás Deutsch

Commissioner of the Hungarian Prime Minister
Digital Success Programme

2 Executive Summary

The Digital Export Development Strategy (DEDS) is a short-term policy strategy which needs to be revised on an annual basis. The time frame of the strategy is 4 years (2016-2020).

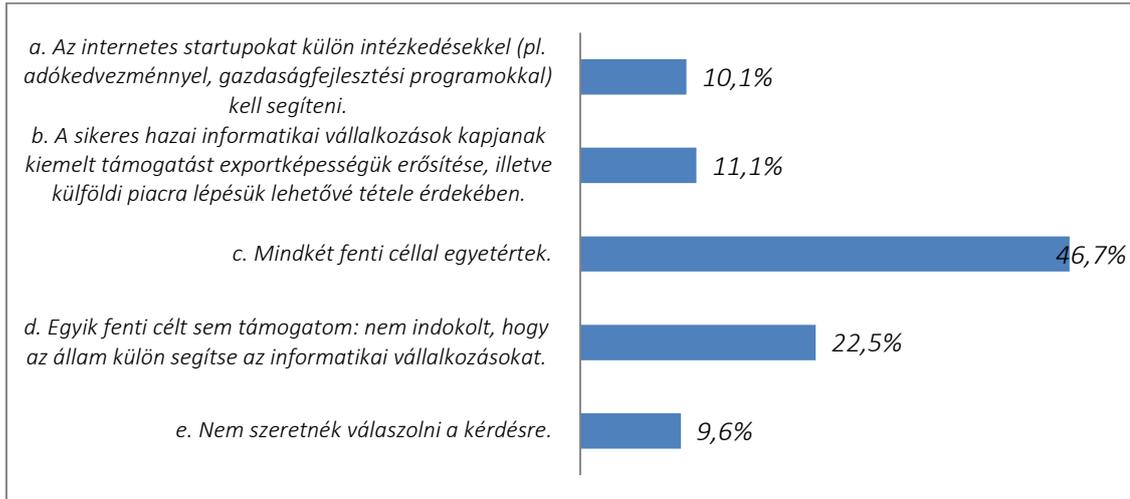
The requirements of this format are set out in Section 35 of Government Decree No 38/2012 of 12 March 2012 on Governmental Strategic Management, including:

- a detailed situation analysis and evaluation concerning the policy area concerned;
- the quantifiable targets to be achieved in the policy area concerned;
- a specification of the area and tools of the required interventions;
- the personal, material, professional, financial and organisational conditions of the necessary interventions;
- the principles and system of implementation, monitoring, and evaluation.

2.1 The Significance and Relations of the Sector

- In Hungary, the digital economy makes up 20% of the gross value added (GVA) of the national economy as a whole and provides work to nearly 15% of all employees. (IVSZ-Századvég, 2015)¹. Strictly speaking, the information and communications technology (ICT) sector accounted for 8.3% of exports within the national economy in 2014 and represented more than 10% of Hungary's R&D expenses in 2013. The sector – including, in particular, the ICT processing industry – is characterised by the presence of large companies, while domestic small and medium-sized enterprises have an increasing role in the ICT services segment, which comprises software and application development companies, among others.
- In response to this phenomenon, the 15th survey question asked in the national consultation on the internet and on digital developments (*InternetKon*) was as follows:
15. Should the State support domestic internet companies? If so, is it necessary to support domestic IT startups with large growth potential in the first place or to strengthen the export capacity of already established and internationally competitive companies?

¹ IVSZ – Századvég: The Economic Footprint of the ICT Sector - A New Methodology for Measuring the Digital Economy



a. Az internetes startupokat külön intézkedésekkel (pl. adókedvezményrel, gazdaságfejlesztési programokkal) kell segíteni.	a. Internet startups should be assisted with special measures (e.g. tax advantages, economic development programmes).
b. A sikeres hazai informatikai vállalkozások kapjanak kiemelt támogatást exportképességük erősítése, illetve külföldi piacra lépésük lehetővé tétele érdekében.	b. Successful domestic IT companies should receive special support in order to strengthen their export capacity and facilitate their entry to foreign markets.
c. Mindkét fenti céllal egyetértek.	c. I agree with both objectives.
d. Egyik fenti célt sem támogatom: nem indokolt, hogy az állam külön segítse az informatikai vállalkozásokat.	d. I do not support either of the above objectives: there is no reason the State should provide special help to IT companies.
e. Nem szeretnék válaszolni a kérdésre.	e. I would prefer not to answer this question.

- It was based on the above result that the objective was set to improve the export capacity of the participants of Hungary's digital industry.
- However, the assistance of successful domestic ICT companies to enter the international market and the support of startup companies require two approaches of different logics and partly different contents, therefore, it seems appropriate to determine the necessary state interventions separately, based on the results of the *InternetKon* survey. This issue is prioritised in Government Decision No 1069/2014 of 19 February 2014 on Hungary's National Infocommunications Strategy (National Infocommunications Strategy, hereinafter NIS), which did not identify any regulatory actions to be taken in this respect.
- Given the size of the domestic market, the only guarantee for the long-term growth of ICT SMEs is through enhancing their export sales. The primary means of increasing the export capacity is not the establishment of individual measures but the development and consistent implementation of a coherent strategy.
- Pursuant to paragraph 6(c) of Government Decision No 2012/2015 of 29 December 2015 on the Digital Success Programme, the Government intends to achieve the above goals via the Digital Export Development Strategy. The Digital Startup Strategy of Hungary is elaborated concurrently with this Strategy.

3 Target System

3.1 The Overall Objective and Measurability of the DEDS

The overall objective of the Digital Export Development Strategy is to intensify the growth of digital product exports with a view to developing strong digitalisation knowledge in Hungary, which will

- have a strong modernisation effect on the economy, especially on the SME sector;
- create a large number of attractive jobs for young people;
- facilitate Hungary's judgement by foreign markets and improve its country image;
- facilitate the implementation of the Irinyi Plan on the specification of the directions of innovative industrial development in the economy as a whole;
- serve as an example – as an industry pilot – for the export and SME development plans of other industries.

All in all, it will contribute to Hungary's becoming the beneficiary of the digitalisation trend.

3.1.1 The Digital Product and Service

For the moment, there is no generally accepted definition for the term “digital product and service.” The adjective “digital” refers to a dual state as opposed to the analogue, continuously variable value. Digital signals are common in electronics and they enable the analogue signals of real life that are difficult to manage to turn into a sequence of digital signals and numbers, i.e. information which is much easier to handle. Digital signals are easy to store, suitable for carrying out operations on them, and can be transmitted to large distances without any information distortion or loss.

The infocommunications industry is based on digital signal processing. Practically, all ICT products are digital products. In the past decade, other industries that had used analogue technology before also switched to digital signal processing (such as consumer electronics, photography, film production, and medical technology).

In the latest wave of digitalisation, analogue electronic systems have been replaced by digital systems in almost all industries. For example, digital technology constitutes 30% of the value of an average car (engine control, security systems, on-board information). Basically, digital systems consist of two parts - hardware (electronic parts) and software (code describing operation). The ultimate purpose of production is to minimise the hardware content – i.e. the number of electronic devices used – and solve the tasks with the software part, which can be reproduced at no cost.

The world's production of hardware devices is concentrated in the hands of a small number of major producers and is mostly automated. Consequently, according to the generally accepted

industry experience, Hungary can produce substantial added value only with software and the related professional consulting activities.

Based on the foregoing, we suggest that the Digital Export Development Strategy should cover products and services that use digital technology to an extent higher than 50% and in the production of digital technology the resulting Hungarian added value should exceed 50%.

This means that the production of vehicles as well as other machinery, equipment and computer accessories is not part of digital export, while ICT software and the related services as well as specialised hardware (e.g. encryption devices) are included in the strategy.

3.1.2 Measurability

The digital product defined in subparagraph 3.1.1 cannot be classified according to a Hungarian NACE code, so there is no available report by the CSO (Hungarian Central Statistical Office) concerning the export of digital products. In order to ensure the successful implementation of the strategy, it is necessary to analyse the production of digital products from various aspects, which requires the following key data:

- domestic production volume;
- GDP value;
- export volume;
- jobs.

3.1.3 Indicative Goals

The first version of the Digital Export Development Strategy specifies the definition and evaluation frameworks, while the indicative quantifiable goals can be set at the end of the first year of implementation (June 2017). Since the digital sector is developing by leaps and bounds, it is advisable to carry out an annual review of the DEDES based on the results achieved, the efficiency of the intervention points, and changes in the market.

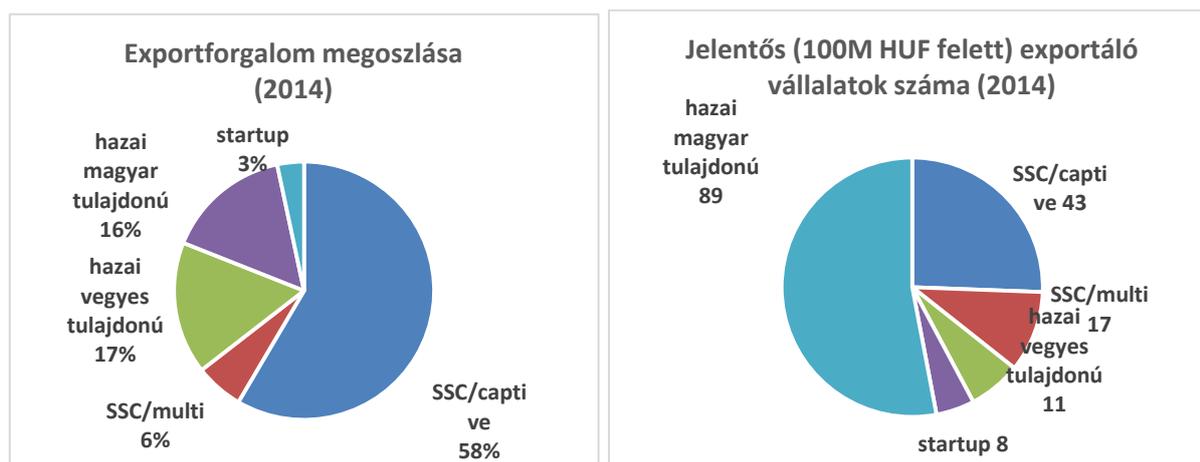
3.2 Details of the Target System of the DEDES

Already at present, Hungary has a substantial volume of digital product and service export. The strategy seeks to identify the typical export scenarios based on the questions “who?, what?, where? and how?”, as these will be the pillars of the strategy. Within each pillar we examine the elements of the entire life cycle:

- Under what circumstances and who can create exportable digital products or services?
- In what way and to which export destinations can this product/service be sold?
- What kind of preparation does this require?



Digital export can be broken down based on the characteristics of ICT export including, in particular, the export of software and services, which represents a high added value. This is supported by the export study of the ICT Association of Hungary (IVSZ).



Software and services export survey²

Exportforgalom megoszlása (2014)	Distribution of export turnover (2014)
hazai magyar tulajdonú 16%	domestic Hungarian-owned companies 16%
hazai vegyes tulajdonú 17%	domestic mixed-ownership companies 17%
SSC/multi 6%	SSC/multinational companies 6%
Jelentős (100M HUF felett) exportáló vállalatok száma (2014)	Number of companies with a significant export turnover (above HUF 100M) (2014)
hazai magyar tulajdonú 89	domestic Hungarian-owned 89
SSC/captive 43	SSC/captive 43
SSC/multi 17	SSC/multinational 17
hazai vegyes tulajdonú 11	domestic mixed-ownership 11
startup 8	startup 8

Typical forms of export activities:

- the services centres of international companies;
- the software and service export of domestic companies;
- startup companies engaged in digital technological innovation.

Regarding export destinations, the “Opening to the East” and “Opening to the South” strategies of the Ministry of Foreign Affairs and Trade create an opportunity for the utilisation of the Hungarian governmental systems and knowledge on the foreign markets, including the establishment of new Government to Government (G2G) and Business to Government (B2G) export opportunities, therefore, the DEDS wishes to treat this as a separate pillar.

Main	To increase the export performance of the Hungarian digital industry
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² IVSZ’s software and service export survey report (IVSZ, 2015)

objective				
Sub-goals	To improve Hungary's digital competitiveness	To improve the export efficiency of digital products and services		To develop digital competences and services
Measure (pillar)	Export of State digital solutions	Export development of startups (Digital Startup Strategy)	Export development of SMEs	Export development of SSCs
Horizontal area	Provision of human resources			
	Measurement of economic impact (GDP, export, jobs)			

The provision of human resources required for the export activity can be divided into two categories: mostly, but not exclusively ICT professionals, independent of the form of export, who produce digital products and specialists engaged in export sales specific to the individual pillars. The training of professionals requiring special knowledge is discussed within the pillars, while interventions recommended in general ICT specialist training are summarised in a separate horizontal part.

The penetration of digital technology into the economic sectors is taking place extremely fast, in fact, it is becoming a key factor which determines production in many sectors (e.g. the automotive industry, agriculture, and the health industry).

These processes must be continuously monitored because industries will soon be interoperable along digital technologies:

- the solutions of industry "A" can be used in industry "B";
- the innovations of industry "A" will mean an immediate comparative advantage when utilised in industry "B";
- the introduction of digital technologies will require a large number of ICT professionals.

Based on the above, another important deliverable of the strategy is to build a monitoring system that is suitable for measuring the impact of digitalisation on the national economy as a whole.

4 Situation Analysis

4.1 The Interests, Needs and Opportunities System of Participants Affected by the DEES

According to a survey conducted by the ICT Association of Hungary (IVSZ), the volume of Hungary's digital export is worth around HUF 400 billion and has been dynamically growing in all sub-segments in the recent years.

Before examining the situation of exporting companies pillar by pillar, it should be emphasised that each pillar has an important role in the development of digital product and service export, so it would be a strategic error to give priority to any of them.

The advantage of services centres:

- Creation of jobs for employees who cannot find employment opportunities in other sectors;
- Adaptation of the international work culture, introduction of modern management knowledge;
- The development-focused centres (e.g. GE, EVOSoft, Ericson) serve as a tool for acquiring world leading knowledge and keeping young workers interested in research and world-class projects in Hungary.

The advantage of startups:

- The engines of export-focused innovation;
- Efficient areas for the international financing of Hungarian ideas;
- An efficient tool for importing world-class trade and marketing knowledge to Hungary.

The advantage of domestic exporting companies:

- They have an impact on the competitiveness of the domestic market;
- They serve as targets of acquisition and the inflow of working capital;
- They keep the generated profit in the country.

We planned the situation, the interests and the opportunities of companies taking part in the individual pillars with the involvement of governmental leaders in charge of or related to the area concerned as well as of market players and experts:

- 100 Hungarian businesses were contacted through a WEB-based evaluation system and in-depth interviews were conducted with 25 companies. Based on this, the experts of IVSZ and a working team consisting of the leading specialists of companies who are experienced in export development set up the target system and recommended tools of the strategy together with the experts of Magyar Nemzeti Kereskedőház Zrt. (Hungarian National Trading House, hereinafter: MNKH);
- We evaluated the situation of services centres with the involvement of the Hungarian Investment Promotion Agency (HIPA), the Hungarian Service and Outsourcing Association, and five services centres;
- As for startups, no analysis was carried out; the cohesion between the Digital Startup Strategy of Hungary (hereinafter: DSS) to be drawn up in the framework of the Digital

Success Programme and this document will be ensured during the DSS preparation process.

- We identified opportunities for the export of governmental solutions and knowledge through company interviews and in cooperation with a working team consisting of the leading experts of governmental institutions competent in the area (Ministry of National Development, Bay Zoltán Applied Research Institute, Hungarian National Trading House, Hungarian Research, Development and Innovation Office);
- The measures targeted at the development of human capacities were formed on the basis of consultations with the heads of the Budapest University of Technology and Economics, companies engaged in market-based ICT training, and the Digital Education Strategy (hereinafter: DOS);
- We consulted the executive officers of the Hungarian Central Statistical Office to elaborate the efficient measurability of the digital economy.

For the purposes of the situation analysis we used the following simplified life cycle model:



During the course of the situation assessment most information, ideas and proposals were submitted in respect of the marketisation and trade of the products, while there were relatively few feedbacks in the area of innovation. The efficiency of innovation is highly influenced by the information acquired about emerging market requirements and continuous contact with the market during the innovation (validation). This process can be implemented most efficiently with the Hungarian market, since it is the digitalisation of the Hungarian market that has the largest impact on the innovation stage of digital product and service export. Based on the foregoing, we suggest that the next version of the DEEDS should discuss the experience gained in the export mode of action of the digitalisation of the domestic market (e.g. the Irinyi Plan) in more detail. Innovation is strong in sectors where domestic production companies are powerful and domestic ICT is highly developed. One reason for this is the intensive sector, and this situation may be improved by increasing innovation capacities and possibly importing foreign innovation competence.

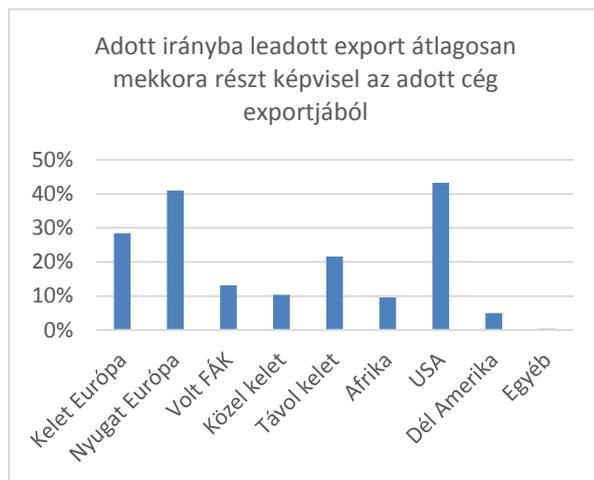
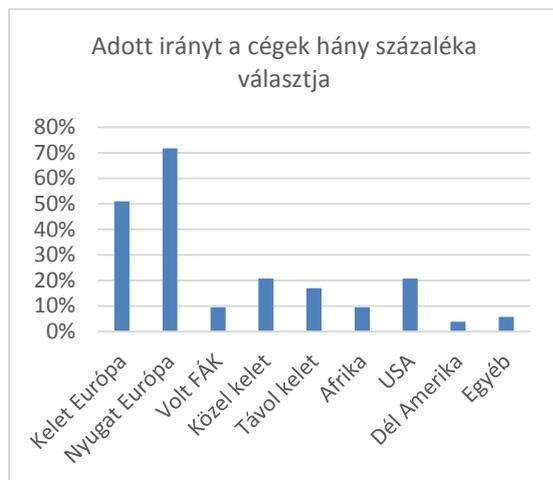
4.1.1 Hungarian ICT Companies

We evaluated the export situation of Hungarian ICT companies by means of in-depth interviews, a WEB-based survey conducted with 100 companies, and the involvement of export specialists, the Hungarian National Trading House, and the ICT Association.

The success of the WEB-based survey was limited because a significant part (some 1/3) of the companies asked to participate refused to share information and explicitly rejected state assistance.



5 legfontosabb lépés az exportfejlesztéshez	The 5 most important steps towards export development
Külföldi partnerek keresése	Finding foreign partners
Export stratégia kialakítása	Drawing up an export strategy
Külföldi piacok megismerése	Getting familiar with foreign markets
Exportálandó megoldás termékesítése	Productization of the solution to be exported
Üzletfejlesztési támogatás	Supporting business development



Adott irányt a cégek hány százaléka választja	What percentage of companies choose these destinations
Kelet Európa	Eastern Europe
Nyugat Európa	Western Europe
Volt FÁK	Former CIS
Közel kelet	Middle East
Távol kelet	Far East
Afrika	Africa
USA	USA
Dél Amerika	South America
Egyéb	Other
Adott irányba leadott export átlagosan mekkora részt képvisel az adott cég exportjából	What average percentage of the company's export go to these destinations

Based on the expert consultations, the interviews and the WEB survey the following can be concluded:

- The main export destination is the developed markets, but almost all directions are of interest (virtual products, no borders, possibility of immediate appearance on the world market);
- Entrepreneurs overestimate their innovation capacities and underestimate the efforts required for starting export;
- There is a lack of sufficient experience in trade and marketing;
- The main difficulty is to get familiar with the markets and develop stable market presence (direct, via partners, etc.);
- In the absence of an export strategy businesses will waste resources on entry into export markets that is not well-grounded (this may mean a loss of investment worth up to HUF 100 million per company and per market);
- Opinions vary about the newly developed international system of the Ministry of Foreign Affairs and Trade; many are not aware of the opportunities, and with the exception of the Hungarian National Trading House the usefulness of institutions for ICT export receives negative feedback.
- There is no solution for ICT financing – a majority of ICT companies do not have an appropriate guarantee fund – as the available financing schemes are not aligned with the characteristics of the ICT sector;
- Development funds from the EU can support only the smaller part of the export process, so it is necessary to deploy domestic development resources.

4.1.1.1 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • More than 100 Hungarian companies generate a substantial annual digital export turnover of over HUF 100 million; • The contribution of ICT to GDP is outstanding: Hungary ranks fifth on the comparative list of OECD countries; • Hungarian ICT specialists have a good international reputation; • The ICT industry has a strong professional organisation (IVSZ), which embraces the entire industry; • The activities of startups and SSCs bring up a new team of experts with a modern working culture; 	<ul style="list-style-type: none"> • The digitalisation of the economy lags behind the EU average; domestic SMEs do not show an adequate need for innovation; • The impact of ICT/digitalisation on the efficiency of industrial production is not sufficiently recognised, there are several blank spots; • The quantity and quality of ICT specialist training is far from the market demand; • Due to the lack of collaterals for loans (real property, machinery), the availability of financing schemes for ICT companies is limited;

<ul style="list-style-type: none"> • The successful governmental projects that use disruptive technology (road toll, online cash register) have proved the applicability and efficiency of digital technology. 	<ul style="list-style-type: none"> • The foreign affairs department responsible for economic diplomacy is not sufficiently prepared for supporting domestic ICT companies on foreign markets; • In many cases, companies do not have enough experience in how to develop an export strategy, obtain the first export reference, build business relations, find partners, or make their products exportable; • Domestic companies are not always prepared to take joint action, which would be essential, and the industry is not efficiently represented at international level, either; • The rate of attendance of Hungarian companies at trade fairs and exhibitions organised abroad is low; • We do not have a strong network of expat relations in the ICT centres of the world.
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> • Irinyi Plan/Industry 4.0 – the impact of the German digitalisation programme can spill over quickly owing to the strong foreign trade relations and the presence of German companies in Hungary; • By renewing education and presenting the ICT profession more efficiently, there may be a sharp increase in the number of youths who will choose information technology as a career opportunity; • The lack of ICT workforce may give rise to new, market-based training forms that can quickly respond to market demands. 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> • The international lack of ICT experts will cause further labour force to leave the Hungarian market; • The demands of the digital market are growing fast, and if the Hungarian businesses cannot keep up with the market, they may even be forced out of the Hungarian market quite easily; • The German digitalisation programme may give rise to digital development programmes in the neighbouring countries as well, and any strategic mistake (in planning or implementation) made in this competition may lead to the loss of our current position; • Due to the absence of efficient financing, companies choose to raise capital from abroad, thus reducing their independence.

4.1.2 ICT Startups

Within the framework of the Digital Success Programme a separate strategy is being prepared for the development of startup companies under the title “Digital Startup Strategy of Hungary”. Since pursuant to paragraph 6(a) of Government Decision No 2012/2015 of 29 December 2015 on the Digital Success Programme the DSS will have been finalised by 30 September 2016, this Strategy does not cover this area. It is important to note, however, that startups constitute a key part of digital export.

Startup companies making digital products have achieved notable successes recently (for example Prezi, LogMeIn, Ustream). On the other hand, there is dual consideration concerning the business form: successful startups are based in the United States, only the development activity remains in Hungary. The reasons are as follows:

- the lack of trade and marketing knowledge and a network of relationships;
- Hungary’s image problem on the digital consumer markets (generally characterising smaller countries, except for Finland and Israel, for example);
- the USA-centred nature of digital technology;
- the USA-centred nature of venture capital.

At the same time, the ecosystem developed around the startup corporate form is one of the most efficient innovation supporting systems. The globally standardised system of concepts, ecosystem roles, communication and events lead to rapidly developing corporate cooperation opportunities in which Hungarian businesses can target the entire world market potential of the product they come up with as a result of their innovation, thus making up for the disadvantage caused by the lack of trade and marketing knowledge and the absence of relationships. The startup ecosystem enables Hungarian innovative thinking and knowledge to reach the world market as quickly as possible.

Entrepreneurs who prove to be successful during the course of development of the startup ecosystem (e.g. IND, NNG) will form the knowledge base of domestic venture capital in a time frame of 3-5 years. It is this knowledge that domestic capital can rely on, and this will allow Hungary to achieve more advantageous positions in this corporate segment.

Another important aspect is that the hot spots of the startup ecosystem are being established right now in Europe with Hungary and Budapest competing for the leading position in East-Central Europe.

The success of the startup ecosystem will also have repercussions on other segments of digital product export. Some of the positive effects:

- Improved image of the domestic digital industry on the target markets;
- Strengthening of international relationships by means of events and partner relations;

- Strengthening the innovation focus by setting a good example as well as via knowledge transfer.

The additional competition for the employment of innovative talented workforce induced by startups can be mentioned as a negative impact.

4.1.3 Governmental Infocommunications Solutions

Making governmental administration more efficient is an increasingly strong aspect in all countries. In the past years Hungary has invested significant resources in building a digital state and implementing electronic government. The Hungarian Government has quite a few modern digital systems. Some of them were developed in an effort to meet the requirements of recent years' EU regulations (Schengen), while others were created through the digitalisation of quickly recoverable tax and contribution systems (online cash register, road toll, EKAER - the Electronic Public Road Trade Control System) and can be competitive at international level as well.

Some sub-areas of public administration have excellent, world-class professional competences, and this know-how is not only exportable in a “twinning” scheme, but also as expertise which is available for the digitalisation of governmental activities.

The target markets of the above knowledge can be the states of “Opening to the East” and “Opening to the South” strategies. Hungary has a good rating because European-level technological know-how is not coupled with the political status of a great power, and this is the most favourable situation.

Based on the feedbacks of domestic businesses, the competitors (Austria, AustriaSoft; Germany, GIZ) help export into the governmental sector in a centrally organised manner, with a streamlined institution system.

On the basis of the above, it is recommended to organise the institutionalised export of governmental digital solutions and know-how primarily to the countries of the strategies of opening to the east and the south.

Factors inhibiting efficient export:

- Inadequate coordination;
- Export usability is not a criterion for implementing e-government projects;
- The institution system is not prepared (secondment of experts, etc.);
- Unused opportunities for cooperation;
- The public procurement system cannot handle export situations;
- Export is a trade war to prepare for:
 - o continuous collection of information on the target markets;
 - o establishment of relationships with the decision-makers;
 - o quick, “war-room”-like decision-making;

- “striking a blow” with all available means;
- coping with failure and learning.



Külpiaci kereskedőházak	Trading houses on foreign markets
Több, mint 40 kereskedőház és partner világszerte	More than 40 trading houses and partners worldwide
Közel 120 állomáshelyen misszióját betöltő külgazdasági attasé	External economic attachés on mission at nearly 120 locations
Észak-Amerika	North America
Latin-Amerika és Karib térség	Latin America and the Caribbean
Afrika	Africa
Európa	Europe
Ázsia	Asia
Arab térség	Arab Region

4.1.3.1 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • In Hungarian public administration, there are organisations with very high professional standards and knowledge that can also be utilised internationally; • We have modern, new EU systems; • Given the size of Hungary, we have good central systems; • The economic diplomacy of the Ministry of Foreign Affairs and Trade is increasingly in focus; • The supporting elements of the export process (trade, financing) have been established. 	<ul style="list-style-type: none"> • There are few examples for the joint appearance of the public and the economic sectors on foreign markets, no public administrative practice has been developed for ensuring cooperation; • At present, sales take place on an ad-hoc basis, there is no one to coordinate the system as a whole or manage the operation of the participants; • The export support system is not complete, the investment capacity is missing especially in the preparatory stage of the projects; • Currently there is no approved uniform methodology for the development and marketing of governmental solutions.
Opportunities	Threats
<ul style="list-style-type: none"> • A number of new markets could be opened through professional cooperation 	<ul style="list-style-type: none"> • The participants of the private sector do not intend to cooperate with the state;

<p>and intergovernmental relations, which we are not making use of at the moment;</p> <ul style="list-style-type: none"> • There is potential for new strategic cooperation for the acquisition of new digital solutions, which enable the development of immediately exportable solutions; • The recent disruptive developments may open the way to the increased export of government solutions. 	<ul style="list-style-type: none"> • The organisation of foreign trade attachés (FTAs) is not prepared for securing business; • SSC companies have a negative labour market impact on the companies of the domestic ICT sector because they drain qualified professionals from ICT SMEs.
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4.1.4 Services Centres

SSCs (Shared Services Centres) discovered Hungary in the late nineties, and by now the activity has grown to become an entire industry employing more than 40 thousand workers. From the viewpoint of the national economy, this industry is important also because it can be regarded entirely “white”, its employees receive declared salaries which are at least twice as high as the Hungarian average. In addition, they make maximum use of the opportunities provided by the cafeteria system, and the related tax and contribution payments constitute further substantial revenues for the state economy. SSCs contribute over HUF 120 billion to the annual budget.

In 2013, Site Selection Magazine ranked Budapest in the 35th place on the global scale of SSC investment attractiveness and first in Central and Eastern Europe. This attractiveness seems to decline, therefore, it is vital to urge interventions.

The factor with the largest weight (35%) in this ranking was labour force. One of the key advantages of selecting a Central Eastern European site as compared to the low wages of the Far East is joint business thinking and the increasing added value of the service. “Business intelligence”, which is expected from SSCs, is being continuously developed, and there is a need for workforce supply who speak the languages of the business partners.

The intensive growth seen in the 2000s has somewhat slowed down due to the fact that as the market is growing this supply is getting increasingly problematic. It takes more and more time to find the appropriate workforce and since SSC experience is an advantage, SSCs solicit each other’s employees, which leads to an increase in wages and a wage spiral. Each year services centres recruit thousands of graduate experts, primarily including young professionals with a good command of foreign languages.

The market of services centres is expected to grow further, global businesses are seeking ways to make their operation more efficient, and the current digital technologies render it possible to concentrate certain activities to one location, to the so-called services centres, where those activities can be managed in a more cost-efficient and appropriate manner. Typically, Hungary is considered as the centre for serving the European area even though we are facing

tough competition in this area with the majority of the former socialist countries including, in particular, Poland, Romania and, most recently, with Bulgaria.

The Hungarian Investment Promotion Agency (HIPA) plays an important role in encouraging the establishment of services centres. The Hungarian Service and Outsourcing Association (HOA) is in charge of safeguarding the interests of already established companies. Having consulted these two institutions and the services centres, the following conclusions can be drawn in respect of the present situation:

- The existing IT services centres and the expected continuous demand on the customers' part create an appropriate basis for further expansion;
- Basically, the only barrier to the exploitation of opportunities is the number of employees having the required professional qualifications;
- In addition to Budapest, it would be possible to set up SSC centres in other large towns in the country such as in Debrecen, Szeged, Pécs, Miskolc, and Székesfehérvár, which could also employ labour force from beyond the borders. Today the greatest obstacle to this is the absence of category "A" offices;
- At present, SSC centres are not only competing for labour force with one another but also with the Hungarian ICT companies;
- SSC centres with an ICT profile can employ workforce not only with an ICT qualification, but in customer services and testing jobs, for example, they can hire – after some training – humanities graduates with language competences as well.
- The involvement of domestic SSCs engaged in product development in the creation of university-industrial innovation centres will contribute to improving the competitiveness of both the Hungarian economy and the local SSC sites within their respective companies.
- Currently, services centres are not well-known employers:
 - o the communication of the economic strategy tends to ignore them;
 - o the knowledge associated with services centres and the scientific analysis of their operation are not recognised or accredited in higher education;
 - o at the moment, the Hungarian data and information policy does not deal with the fact that we also process the data of other countries in Hungary, which should be taken into account in the process of legislation (e.g. Act LXIX of 2016 on the amendment of certain acts on counter-terrorism measures);
- Overall, the high tax and contribution burdens put Hungary at a competitive disadvantage vis-à-vis the neighbouring countries.

4.1.4.1 Opportunities in rural areas, urban cooperation

As the labour market of Budapest is getting saturated, new opportunities are opening up in the rural towns. In terms of popularity among Hungarian SSC locations, the capital city is followed by the city of Debrecen: at present, more than 2500 employees work in Debrecen, and in the forthcoming years 400 new jobs are planned to be created in the SSC sector. The competitiveness of the city is strengthened by its high-standard secondary and tertiary education and the many years of experience gained in the SSC field.

Székesfehérvár deserves special attention on the map of Hungarian services centres, as the number of employees working in this sector has exceeded 2000 by now. 80% of the companies established here have added a services centre to their already operating production facilities.

Hungary has several cities with higher education institutions (Szeged, Pécs, Miskolc, Veszprém). By introducing appropriate specialist training, developing the local infrastructure and ensuring urban cooperation SSCs could be attracted into these cities. The urban strategy launched in Szeged is a good example.

Being the third largest city of Hungary, Szeged has an internationally recognised university. There are about 25,000 students studying at the University of Szeged, and some 5,500 of its graduates, most of whom are youths speaking foreign languages, enter the labour market annually. Consequently, one of the most important factors for establishment in this city is the availability of qualified youths who speak foreign languages. In addition, its vicinity to Budapest (1.5 hours, 170 km) and the international airport as well as the direct motorway connection make it easy to access. The triple border is also near, and many employees commute on a daily basis.

Szeged is a centre of university life, culture, science, medicine, and public administration. It is the greenest and most “bicycle-friendly” of all cities and has a good traffic system with most of its public transport being electrically powered (tram and trolleybus).

The leaders of the city are highly committed to welcoming job-creating investments. The deputy mayor for developments is prepared to cooperate and has a supportive attitude towards all positive projects aimed at the improvement of the city. Through its non-profit company and the employment of an expert team engaged in investment promotion, the municipality provides a “one-stop-shop service for investors” and acts as a partner in all investment-related requests.

More specifically, an association called SSC Szeged Project was developed as a result of widespread cooperation in the SSC topic with participants including the city management, the team of the municipal non-profit company as well as the Faculty of Economics and Humanities of the University of Szeged, all aiming to strengthen the sector in Szeged. There is continuous communication going on with the local business sector, service providers, and property developers.

The IT sector is given priority in Szeged. Many local and numerous national and international IT companies are represented in Szeged and have set up multi-actor development centres (such as EPAM, NNG, LogMeIn, GE Healthcare, CAS, EvoSoft, GriffSoft, etc.).

It is especially true in the SSC area that there is a great number of potential labour force.

Nevertheless, labour force is not the only obstacle to development. Regarding the quality and number of office buildings, Szeged has received a lot of criticism, and the same applies to the other rural cities of Hungary as well. Through extensive cooperation and conscious management, it has been made possible to widen the range. As far as the number of requests and the requirements of potential investors are concerned, it can be concluded that if there were more turnkey office buildings or ones to be completed in the near future, a large number of new jobs could be created.

To sum up, there is potential for the creation of plenty of SSC jobs

- in places where ICT training is available at university level;
- where the leaders of the city are highly committed to job-creating investments;
- where the municipality and the university are prepared to cooperate;
- where there is sufficient potential labour force available;
- where category “A” office buildings are or can be made available.

4.1.4.2 SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Mature SSC market (25 years of experience); • Quality of labour; • Availability of a wide range of foreign languages; • Location: GMT + 1 (possibility of providing global services); • Developed office space market in Budapest, favourable rents; • Attractiveness of life in Budapest/Hungary. 	<ul style="list-style-type: none"> • Decrease in the number of college and university students (IT, economic and language faculties); • Declining language and professional competences; • Failure of training to meet market demands; • Gradual saturation of the market of Budapest; • Still low reputation of the sector; • Underdeveloped office market in rural areas.
Opportunities	Threats
<ul style="list-style-type: none"> • Development potential of rural university towns; 	<ul style="list-style-type: none"> • Brain drain, labour migration; • Substantial R&D allowances provided by

<ul style="list-style-type: none"> • Cooperation of rural municipalities and office space developers; • Gradual increase in wages and low level of satisfaction with local labour in the Far East; • Considerable lack of labour in Western Europe and the USA; • Promotion of reinvestments by already established companies and the targeting of companies which have an IT profile which can be regarded traditional and which are engaged in production activities. 	<ul style="list-style-type: none"> other countries; • Emergence of a wage spiral; • Development of Romania (Bucharest, Timișoara); • Outsourcing of simple tasks to Asia; • Decreasing cost advantage.
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4.1.5 Human Resources

4.1.5.1 Supply of ICT labour

In the past years the dynamic growth in the number of SSC-related jobs, the development of the digital startup ecosystem, the spread of digitalisation in the economy, and the increasing migration of labour abroad have resulted in a considerable lack of IT experts in the Hungarian market. In 2015 the Ministry of National Development (MND) initiated a labour survey, which predicted the creation of 22,000 new IT jobs provided that there is available workforce.

The domestic training systems, however, did not react to the growing demands appropriately. The number of IT graduates is not rising in higher education, nor in vocational/adult training. Employees in IT jobs have increased in number only by 2-3% annually (in 2014 there were approximately 90,930³). Even if these circumstances remain unchanged, it will take at least 7 years to fill the gap, but due to the exponential rise in demands this is impossible without changes.

In addition to the capacity expansion and content renewal of traditional training systems (vocational training, higher education), it is necessary to introduce short-cycle training solutions which are capable of addressing target groups that cannot access the traditional systems.

Annual increase in the number of employees in the ICT sector ⁴	3,000 people
Total number of new IT specialists per year:	8,036 people
+ Corrected output in higher education (in 2014)	4,800 people

³ National Tax and Customs Administration of Hungary : number of employees in the ICT sector, 2014

⁴ The number of employees in the ICT sector based on the Tax Administration's (NAV) data: (110.7 thousand employees in 2013 according to the Central Statistical Office)

+ National Qualification Register (NQR) output in formal and non-formal education (in 2015)	2,236 people
+Other adult education (estimate)	1,000 people
Difference	5,036 people

Despite the fact that more than 8,000 IT specialists are trained annually at various levels, the number of employees⁵ in the ICT sector is growing only by 3,000 a year. The difference is made up partly of those about to retire and partly of those employed abroad. While, regardless of the training output, the number of retiring employees is slowly rising, the number of those working abroad is growing in proportion with the increase in the number of training graduates.

IT TRAINING	TIME	OUTPUT HEADCOUNT
Higher education (in 2014)		
Economic IT specialist- higher vocational education and training (VET)	4 semesters	238
Economic IT specialist BSc	7 semesters	1,365
Economic IT specialist MSc	4 semesters	106
Engineering information specialist - higher VET	4 semesters	298
Engineering information specialist BSc	7 semesters	2,023
Engineering information specialist MSc	4 semesters	404
Programming IT specialist - higher VET	4 semesters	154
Programming IT specialist BSc	6 semesters	1,306
Programming IT specialist MSc	4 semesters	180
Total:		5 836
NQR (in 2015)		
CAD-CAM IT specialist	2 years/960-1300 hours	439
Economic IT specialist	2 years/960-1300 hours	149
Infocommunications network builder and operator	2 years/960-1440 hours	47
IT system operator	2 years/960-1440 hours	1,051
Technical IT specialist	2 years/960-1440 hours	139
Software engineer	2 years/960-1440 hours	244
Software operator-application administrators	600-900 hours	167

⁵ Note: Not all employees working in the ICT sector are IT specialists, while IT specialists are employed in other sectors as well.

Total:	2,236
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While the quantity of the training output is stagnating, the demand is growing continuously, so without potential new sources of IT specialists or IT training solutions there is no hope to make up for or at least reduce the current staff shortage of 22,000. As a consequence of digital transformation, the need for IT specialists is not only generated by the infocommunications sector, but by the other sectors as well, at an increasing rate, because in order to stay competitive they have to use digital technologies in a wider range of areas. Besides the quantitative increase in training output, this process requires a content reform as well. The contents of secondary and higher vocational education must be updated and replaced at an accelerating pace. The need for content renewal is already indicated by the extremely high drop-out rate of higher education courses (52%), which also shows the dysfunctionality of the public education system.

4.1.5.2 Quality of ICT Staff Training

The development of information technology has accelerated to such an extent that training systems – including vocational training and higher education – can hardly keep up with. It is necessary to implement actions that keep the content, methodology and set of tools used in training and education up-to-date, including the following:

- integration of the know-how, certifications and knowledge bases created by industrial actors by strengthening the cooperation of businesses and training organisations;
- integration of the technological and methodological environment used in the industry into practical training through dual and other training forms;
- involvement of a wide group of experts who know how to apply the latest technologies in practice into training and education;

However, the greatest problem is the continuous migration of higher education staff, because their remuneration remains far behind the entry-level salaries of graduates in the industry (an assistant professor earns HUF 260,000 in gross, while the initial salary of a career starter in the industry is HUF 3-400,000). Not only does this gap jeopardise the future supply of professors, but it also causes the market to drain the existing education staff away from the universities. The financing of ICT education does not lag behind that of other areas of education, but the extremely strong brain drain effect of the market endangers the operation of the ICT education system as a whole.

4.1.5.3 Cooperation of Higher Education and the Industry

The dual training system designed to strengthen cooperation with the industry cannot be used efficiently in the ICT sector because

- the two-week cycles of industrial traineeship included in the dual training scheme are too short for completing a typical ICT project; the ideal term of placement at a company would be between 3 and 6 months;

- there is a high degree of mobility among employment opportunities on the ICT market, therefore, in the framework of dual training an employer can rarely transfer special knowledge that the student can utilise only at that specific employer in a way that dual training could prove to be good value for money.

Instead, the industry attracts students before they receive their degree, offering them full-value employment contracts. The number of MSc graduates is dramatically low, which is a problem because there is a need for highly qualified engineers with strong mathematical and combinatorial skills who are capable of designing system architectures, especially for the implementation of new innovations generated by digitalisation.

To sum up, both the quantitative and qualitative indicators of ICT specialist training must be increased because this is the greatest obstacle to digital export development today.

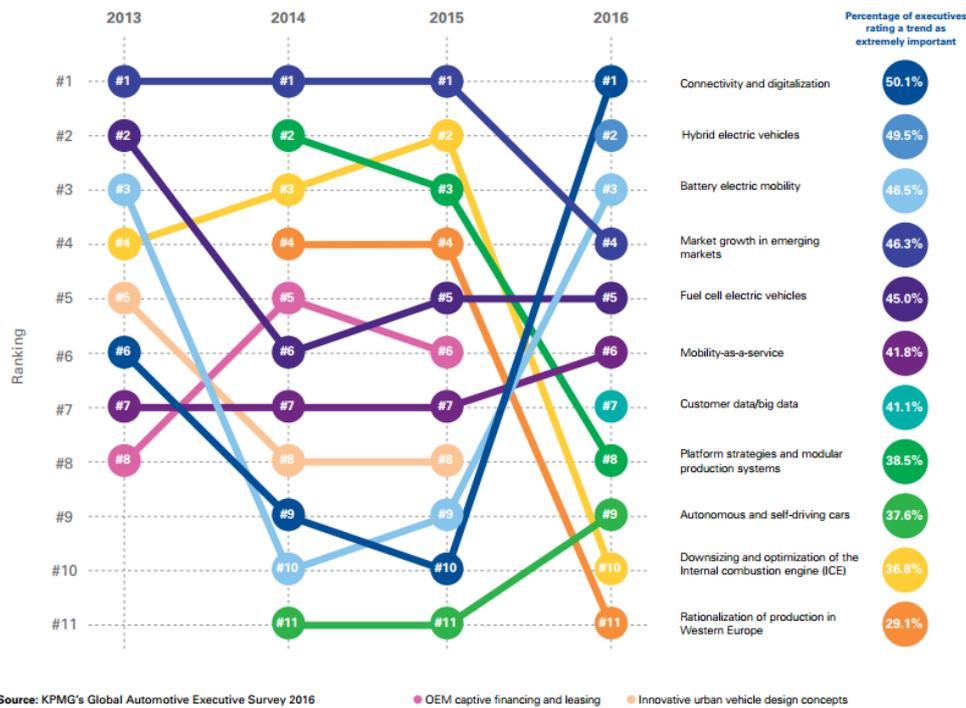
4.1.6 Measurement of the Digital Economy and Export

Digitalisation is rapidly transforming all sectors of the economy. At present, there is no standardised methodology available for the purposes of carrying out a detailed analysis of the size and dynamics of the digital economy. The modelling and measurement of the application of digitalisation in the various economic sectors could give a true view of:

- the expected demand for labour;
- innovation opportunities;
- the needs for infrastructure development;
- the expected regulatory tasks.

At the request of IVSZ, Századvég Gazdaságkutató Zrt. prepared a simplified model for measuring the digital economy. The model uses the Central Statistical Office's Sectoral Relations Balance to estimate the size of the digital economy taking the input and output multiplier effects of the ICT sector into account.

In France, a detailed survey was conducted to find out the value of digitalisation in final products in each industry. In the automotive industry, for example, the ratio of digital electronics is 30% in the case of traditional cars, 50% in hybrid ones, and nearly 80% in electric vehicles. The annual automotive survey of KPMG clearly shows the advancement of digitalisation:



Key trends in the automotive industry until 2025⁶

In addition to the automotive industry, the role of digitalisation is getting stronger in other sectors as well. In Germany, the joint industrial and governmental initiative “Industry 4.0” was set up with the aim of accelerating the digitalisation of machine production.

To measure the indicative targets of the Digital Export Development Strategy, in the first round it is sufficient to measure the export of ICT software and services. For further development and a better understanding of the effects of digitalisation it would be essential to prepare a comprehensive analysis based on the existing statistical data.

5 Detailed Presentation of the Targets and Measures

5.1 The Digital Export Development of Hungarian Micro, Small and Medium-sized Enterprises

As the situation analysis has shown, the expansion of the export of domestic micro, small and medium-sized enterprises basically requires the development of three areas:

- To create financial facilities for developing and planning the export capacity, taking the first steps, and providing temporary financing for production and trade;
- To develop the export capacity of businesses;
- To support the establishment of sales channels.

⁶ Global Automotive Executive Survey 2016 (KPMG)

During the WEB-based export survey a large number of companies refused to take part on the grounds that they do not need state support. We are of the opinion that if the DEDS measure package is successful, this ratio will substantially decrease, so we are not planning to take any specific action in this respect. This issue must be readdressed and the change in this attitude of businesses must be examined during the annual review of the export strategy.

5.1.1 Training

Measure: Export academy for business managers

Based on experience, without acquiring the management know-how necessary for efficient export, undertakings tend to start export activities that are unprepared and unfounded and often end up in failure, wasting financial resources and causing entrepreneurs to restrain from further export activities.

The success of the Export Academy operated by MNKH proves that there is a need for developing and implementing a new, ICT-focused training programme with its own curriculum. The extended training is required due to the characteristics of the export of ICT products and especially ICT services.

It is recommended to elaborate the programme in view of international good practices, for example the Irish export capacity development programme (Catalyst), which won the EU's European Training Foundation International Best Practice Programme title.

In the course of the 6-month programme the participants acquire the management and trade knowledge necessary for export activities and prepare their company's export strategy and operational business plan, which they can immediately start implementing. During the programme experienced mentors and international businessmen assist the development of the participants and the preparation of their export plans, and at the end of the programme they evaluate the plans.

In addition to Ireland, the programme is used in many other countries of Europe (Czech Republic, Malta, Lithuania and Latvia), in the Middle East as well as in West African countries.

We suggest that Catalyst or a similar programme should be introduced in Hungary.

Measure: Service and software export training at foreign trade schools

The present curriculum of foreign trade training is based on knowledge relating to traditional trade. The foreign trade of ICT products and services requires special, but clearly definable professional knowledge. Trade-related knowledge is less relevant in the ICT area, while know-hows concerning the sale of intellectual property and services are given much more emphasis. These have been acquired by specialists currently working on the Hungarian ICT market either in practice or in the form of company training. At the moment, the subjects taught in foreign trade oriented higher education courses do not or only partially enable

specialisation in ICT. In order to provide a supply of trading and marketing staff of suitable quantity and quality, ICT specialisation must be made available within the related study programmes by extending and transforming the curriculum in the following topics:

- Basics of ICT (not for ICT specialists);
- Intellectual property right (copyrights, industrial property rights);
- Services marketing;
- Basics of services management;
- Basics of project management;
- Technology and innovation management (not for ICT specialists).

5.1.2 Development of New Exporting Companies

Measure: Normative support for acquiring export capacity and starting export

For the purposes of identifying the areas of financing interventions, let us first look at undertakings that have not yet gained any export experience but are planning to enter foreign markets in the future. In their case, the intervention involves supporting three consecutive areas.

The normative support is available to companies whose activity proved profitable in the past period (1-3 years) and have resources dedicated to this area. The support is granted on a consecutive basis. The results of each stage must be presented to an independent professional committee, which evaluates not only the professional concepts but also the results of each stage, and approves them so that the project can proceed.

The total amount of the normative support for the three stages ranges between HUF 5 to 10 million per company. The planned number of business undertakings to be supported: 150



5.1.2.1 Acquiring and Developing Export Capacity

In order to build an organisation's export capacities, it is necessary to implement investments and developments as well as to further train and expand human resources.

The normative state aid allocated for the purposes of developing export capacities can be used in the following areas:

- market research and validation;

- development of human resources – business development skills, English (or other foreign languages), pitching, presentation (soft-skill);
- legal advice;
- patent advice and procedure;
- marketing preparedness: website, product descriptions;
- development and drawing up of the export strategy – organisation development, marketing plan, etc.

The company's export strategy is an important closing document of this stage, which the undertaking must submit to the committee in the form of a presentation.

5.1.2.2 Implementing the areas defined in the export strategy

The organisations who have successfully taken part in the first stage are eligible for the second round of the normative support so they can carry out the preparations specified in the strategy. This is the stage of organisation development, the preparation and designing of foreign language marketing materials, etc.

5.1.2.3 Supporting market entry

The third part of the normative support is aimed at helping companies start the export activity in a specific country. The amount granted can be used for the following purposes, depending on the company's export strategy:

- construction of office space;
- financing marketing campaigns;
- acquisition;
- organisation of events for partners, participation at trade fairs;
- recruitment of foreign staff, etc.

5.1.3 Market Expansion

5.1.3.1 Finding, familiarising with and contacting target markets

<i>Measure: Interdepartmental Committee for Digital Export Development (IC DEP)</i>
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After identifying the target countries of digital export, the specific sub-strategies and action plans must be drawn up, taking account of the specialities of the country in question. To this end, it is necessary to set up an interdepartmental committee to be headed by the Ministry of Foreign Affairs and Trade, which will prepare the plan for the individual countries as "accounts".

The committee is chaired by the deputy state secretary in charge of foreign economic affairs, other members are the Ministry of National Economy, the Ministry of National Development, the Hungarian National Trading House, Eximbank, Bay Zoltán Alkalmazott Kutatási Közhasznú Nonprofit Kft. (Bay Zoltán Applied Research Public Benefit Purpose Non-profit

Ltd.), Hipavillon, Design Terminal, the Hungarian National Media and Infocommunications Authority, and IVSZ. The committee's tasks:

- To collect information on the target destinations;
- To compile and publish the Hungarian introduction material;
- To contact professional organisations, the economic joint committee, etc.;
- To organise country presentations – Export evenings (ambassador, S&T, Hungarian National Trading House, already exporting ICT companies).

Measure: Building foreign partnerships

The surveys have clearly shown that the primary export markets of domestic ICT companies are the Member States of the European Union. ICT export takes place mainly via partners and distributors. At the same time, it is rather difficult for the undertakings concerned to find reliable partners in the countries of destination that have appropriate professional competences, references and clientele.

The purpose of the measure is to build a network of professional relationships, a database and a system of events in support of Hungarian ICT export, which will give businesses intending to enter foreign markets substantial assistance in finding distributors, project partners, main contractors or resellers that meet their profile.

In the European Union, it is the IVSZ's task to establish the database, the event system, and the network of professional relationships. IVSZ will carry out this task in accordance with its partner organisations operating in the European countries.

As regards destinations outside the European Union, it will be the joint responsibility of the Hungarian National Trading House and IVSZ to set up the relationship network, the database, and the event system.

The financing requirement for setting up and operating the relationship network, the database, and the event system is HUF 150 million/year in respect of the EU and HUF 150 million/year in respect of non-EU target countries.

5.1.3.2 Supporting entry into new markets

Measure: Supporting the expansion of existing export activities with repayable and non-repayable instruments

It is necessary to give higher amounts of aid to companies that have already proven their viability on foreign markets. The expansion of the export portfolio or the selection of destinations should be supported with repayable and non-repayable grants.

Repayable and non-repayable grants are available to undertakings the export income of which exceeded HUF 50 million in the previous financial year and that have a written export development strategy. The criterion of eligibility for the grants is that the undertaking must

submit its concepts for export expansion to the independent professional committee in the framework of a presentation.

The repayable and non-repayable grants are only available together. It is not possible to apply for the non-repayable grant alone. The amount of the mixed grants can range between HUF 50 million and 100 million per company. In return for the support the company undertakes the obligation to increase its export volume by 15%, but not less than the total value of the grant in the following year. The planned number of companies to be supported: 50 The total resource demand of the intervention: HUF 3,000 million.

5.1.3.3 Preferential financing of export businesses

Measure: Other financial aid - ICT export pre-financing loan

Even if businesses producing for or providing services on export markets are able to sell their products and services above the domestic price level, their presence on the foreign markets often require extra costs, which must be financed. Such extra costs may result from the higher transportation expenses arising in relation to production or the cash-flow difficulties caused by the longer production lead times or, in the case of project-based services, because the increased daily fees or mission allowances payable until the first payment milestone of the fixed-rate contract need to be financed. On account of this latter, however, undertakings are often compelled to miss these opportunities as many domestic companies cannot take any additional financing.

Since the factoring of issued invoices does not provide a solution to this problem because the invoice is issued around the end of the period to be financed, in order to solve the above-detailed problem, a loan fund must be established to allocate a preferential loan to companies producing for or rendering services on foreign markets.

The collateral for the preferential, low-interest pre-financing loan is the duly signed supply and/or services contract, so no further guarantee is required.

The available loan amount is equivalent to 75% of the value of payment to be first made under the contract. The annual percentage rate of charge is the central bank's current base rate.

Planned amount of the loan fund: HUF 10 billion.

Recommended operating structure: Eximbank or MFB.

Measure: ICT sectoral loan guarantee fund

At present, the following guarantee organisations operate on the Hungarian market:

- **Agrár-vállalkozási Hitelgarancia Alapítvány** (Rural Credit Guarantee Foundation) – State-subsidised guarantee for micro, small and medium-sized enterprises operating in

the area of agriculture or engaged in activities related to the rural areas to secure their credit, loan, bank guarantee, leasing and factoring transactions and non-state guarantee provided at the Foundation's own risk.

- **Garantiqa Hitelgarancia Zrt.** - Guarantee with 85% counter-guarantee by the state for loans, bank guarantees, leasing and factoring contracts. Larger amounts of bank loans are available within the framework of the Széchenyi Card Programme in a simplified procedure, based on individual assessment.
- **Start Garancia** - Project guarantee for financing job-creating investments (National Employment Fund) and EU grants, loan guarantee alongside the New Széchenyi Credit up to an amount of HUF 50 million, performance guarantee for public procurement tenders, capital guarantee for professional financial investors for their investments in SMEs.
- **MEHIB Magyar Exporthitel Biztosító Zrt. (MEHIB Hungarian Export Credit Insurance Co.)**

Based on the above facilities and taking into consideration the specific features of the operation, capital adequacy and financing of the ICT sector and its businesses, it is necessary to establish a loan guarantee fund for the ICT sector to be supported with state resources, which provides guarantees so as to help domestic ICT startups and particularly export-oriented domestic ICT SMEs to raise loans and access bank guarantees. This way it will be possible also for companies that have no sufficient collateral to offer to receive loans and bank guarantees because the financing commercial banks find lending too risky without a secured or supplemented collateral in the background. It is especially important also because in Hungary access to loans is rather difficult and the banks' financing willingness is extremely low.

Guarantees would be available for entities and private entrepreneurs that are classified as small and medium-sized enterprises under Act XXXIV of 2004 on small and medium-sized enterprises and the support of their development and the ratio of their turnover from the ICT activity exceeds 50% of their total turnover.

The guarantee is available for the following loans and financial facilities:

- working capital loans;
- overdraft facilities;
- revolving credit;
- investment and development loans;
- business credit lines;
- bank guarantees;

- leasing;
- and factoring transactions.

The guarantee is available for up to 8-10-year loans, bank guarantees, or other financing schemes.

The maximum amount of the guarantee is HUF 100 million per applicant on condition that for the purposes of calculating the amount of the guarantee the various loans, bank guarantees and financing facilities are added up. The size of the guarantee is 70-80% of the total amount of the principal amount, the interests and other interest-like charges payable under the loan contract.

Measure: Tax advantage

In addition to and parallel with the repayable and non-repayable grants, it is necessary to support the start of export activity and new market entry of successfully operating businesses that are mature enough for export also with tax advantages and deferred tax.

This form of financing works in a way that the costs and investments required for entry into new markets – whether it is the first export destination or the expansion of an already existing activity – are recorded in a separate sub-account group, the balance of which reduces the corporate and local business tax bases in the year when those costs arise or when the investment is carried out.

Each undertaking, if profitable in the 3 years preceding its foreign expansion, can set aside up to 20% of its turnover for financing its export activities. The separated amount can be spent on investments, covering the costs of services, paying wages, acquisition, or on any financing facility aimed at covering the costs and investments of its foreign market activity.

The separated amount is “withdrawn” from the Corporate Income Tax and the HIPA funds for a period of 3 years. The undertaking agrees that by the end of the third year the income from its new export activity will have reached at least the amount separated. If this commitment is fulfilled, the separated amount will be removed from the Corporate Income Tax or HIPA funds “definitively”. Should the company fail to meet this commitment, the taxes must be repaid retroactively.

5.2 Development of the export of digital services through services centres (SSC)

The services centres are capable of creating a large number of digital jobs. In this area, Hungary is in a keen competition mainly with the Czech Republic, Poland, Romania and Bulgaria. The competition is influenced by the cost and availability of labour, the infrastructural environment, and the business environment.

5.2.1 Development of rural centres

Measure: Laying the infrastructural foundations of rural centres

The SSC market is expected to continue growing, however, in Budapest the cost of labour is not optimal for the establishment of new centres. On the other hand, SSCs operating in the digital area in the country could contribute to local staff retention and the development of a critical mass of ICT competence. The best venues for this purpose are the large rural towns which have a university, including an IT faculty. Another potential advantage can be the vicinity of the border, which makes it possible to attract additional workforce from across the border.

The greatest infrastructure problem is the lack of category “A” offices. That is why we recommend that the Modern Cities Programme, the Smart Cities Programme, and the programmes aimed at the establishment of incubator houses should be extended into this direction. Appropriately sized properties and financing schemes should be allocated as a means of motivating all cities with a good potential to build 3,000-5,000 m² easily accessible office buildings.

5.2.2 Providing human resources

The criterion for the development and competitiveness of the SSC industry is to provide for an adequate supply of staff. Taking account of the annual output of higher education and the demand for well-trained, talented staff in other areas of an efficiently operating economy, the SSC industry cannot gain new momentum without training the workforce.

This need could be addressed by restructuring education and training, developing curricula, and launching training and retraining courses that could prepare future employees for the expectations and requirements they may encounter in the world of SSC. Both in the short and long run there is a need for professional training programmes that provide rapid and efficient solutions with a view to ensuring the availability of appropriate staff.

Measure: Intensive foreign language teaching

A key area of education is the appropriate learning of foreign languages. We live in a global world, and Hungary cannot be excluded. Due to the lack of foreign language competences we are at such a degree of competitive disadvantage that can cause us to lag decades behind. Today the English language is a must, and many SSCs expect the knowledge of a second foreign language as well. The general language teaching of the current education system is not sufficient, there is a need for conscious and intensive language training. The only efficient way to achieve this is to give students 6-8 months of training, 8 hours a day. Since this is difficult to implement parallel with work or other courses, a special support scheme should be developed for this period. Either governmental or local employment centres should take a role in supporting students (or SSCs, if necessary) with a view to finding/offering a guaranteed job in the future by providing for their subsistence for the duration of the training. This will make

students committed, knowing that in return for acquiring language competences they will surely have a job, which provides further tax revenues for the state in the long run.

Measure: SSC NQR training

Another important area besides language learning is retraining. It is necessary to launch training programmes that open up a gateway between SSCs and career re-starters or career leavers who speak languages but have no IT qualifications or higher education degrees. The purpose of the programme is to give employees the knowledge, methodologies and tools they need in order to have a greater chance on the SSC labour market. The training does not only cover typical SSC topics but also ones that are relevant to the modern economy and business thinking and also includes digital training.

Measure: SSC scientific degree

Higher education must prepare for the new trend as well as for the continuous, long-term growth and operation of the industry. In Poland, where there are so-called “SSC cities”, which constitute the greatest competitors, the significance of the SSC industry was recognised several years ago, and now they are successfully operating specialised training programmes at the major universities and colleges. Hungary needs to act similarly if it wants to stay competitive, so it should launch specialised SSC training in the framework of higher education.

From the viewpoint of the development of the industry, it would be important to make sure that SSC specialists who have sufficient in-depth knowledge and innovative thinking can acquire scientific (PhD) degrees. An appropriate accreditation system must be elaborated as soon as possible. The state can have a key role in the establishment and successful implementation of specialised training programmes. However, it is essential to involve experienced experts in the transformation of the current deficient and obsolete training thematics. An important pillar of success is to create a uniform industry image and to link services centres with higher education. An indispensable element of proper training is that higher education institutions should take part in the market work and other market participants should take a role in education. It is by closely connecting these two areas that training and ongoing innovation of real market value can be guaranteed. Some industry operators have already taken steps to this end, but even greater cooperation can be achieved if SSCs can see that the state takes their side and supports them as a priority industry.

Measure: Accelerated employment administration

SSCs are specialised centres working in a globalised environment. From time to time it is necessary to employ foreign workforce in SSCs due to the need for some specialised know-how or the knowledge sharing strategy of the international company. These workers are employed by the SSC, arrive in a secure working environment, and help improve the SSC, the

creation of high-value jobs and the expansion of the SSC. Most evidently, it is Hungary's interest to support this process, therefore, we recommend that the administration of employment should be made easier by introducing the SSC fast track system.

5.2.3 Supporting the shift towards innovation and more complex activities

The scope of operation of Hungarian SSCs ranges from basic contract work functions to SSCs producing world-class technology with the highest level of added value. It is essential that the portfolio of SSCs move towards innovative activities of high added value.

Measure: IGD (Individual Government Decision) grants

Projects implemented by SSCs operating in the digital field generally have a staff of 25-30, so this is the headcount with which domestic services centres producing digital products and services can open towards new areas. We recommend that the requirement for creating jobs on an IGD basis should be reduced to 25 jobs in the case of ICT development/innovation positions.

Measure: Extension of the double tax credit

Development-oriented, innovative services centres do not usually have a turnover from products, therefore, they miss the possibility of double tax credit because their production facility is not based in Hungary. In order to support the development activity, we suggest that the double tax credit should be extended to the contribution base, provided that at least 40% of the development work performed by the services centre involves digital products or services.

Measure: Supporting innovation validation

The key to the success of innovation is market validation, i.e. the testing and assessment of a new product or service on the market. In many cases, however, due to their innovative nature, the price of new products is higher than that of those already present on the market. For this reason, the validation of the product and its use by customers do not take place on the Hungarian market but somewhere else in the world, which slows down innovation and puts the operation of Hungarian innovation processes at a disadvantage. We recommend that the development centre should be allowed to support the entry and validation of its product on the Hungarian market up to 20% of the contribution base.

Measure: Designation of data free areas

As the digital economy is developing, the role of the so-called data centres is becoming increasingly important. To ensure fast service, data centres must be located within a certain

distance from the place of intended use. At present, there are 9 such centres in the USA. According to expectations, it will be necessary to establish a similar number of data centres in Europe as well. Hungary could be the location for South-East Europe's data centre (similar to the internet connection centre), but now we are in competition with Vienna for this position. Not only operating but also data processing companies (BigData) tend to settle down near the data centres, thus offering numerous new jobs for serving the entire region.

Measure: Reform of the training support system

The only notable form of support available to services centres in Budapest is the training support. However, application for the support imposes such an unreasonably high administrative burden on the undertakings that many of them do not wish or are unable to apply, causing the competitiveness of our country lag behind in the international competition for a specific project. To eliminate this obstacle, the training support system should be reviewed and its regulation modified.

5.2.4 Recognition of the SSC sector

Today the SSC sector creates jobs of high added value with relatively low FDI requirement, and this is important from the aspect of GDP growth. Nevertheless, the recognition of the sector is low, and its special features are not or not always taken into account in the various regulatory activities. It is of key importance to understand that in the digital world the data stored in Hungary are not always Hungarian data, and this must be taken into consideration for the purposes of any new regulation.

Measure: Establishing the consultation role of HOA in data and IT regulation

The Hungarian Service and Outsourcing Association coordinates the representation of SSC companies, and clearly sees the typical problems and regulatory issues. The management of data, the regulation of information and the internet and the issue of cyber security will most probably require frequent amendments of the relevant laws and regulations in the future. Since such amendments may affect the otherwise prudently operating SSCs to a substantial degree, we recommend that in the preparatory stage of legislation HOA should be involved in an advisory capacity so as to enable the legislator to take the foreseeable impacts in this segment of the economy into consideration.

Measure: Strengthening the foreign visibility of HIPA

HIPA has a key role in strengthening the Hungarian SSC industry. Our country needs to be appealing enough to attract new SSCs to Hungary amidst this extremely keen international competition. Based on the experience of the working team's experts, however, the flow of information is not consistent, HIPA does not know of all planned SSCs, while in some cases SSCs established in our country do not know of HIPA's activity, nor the related opportunities.

At present, HIPA is represented on the international market through the network of foreign trade attachés (FTA) working at embassies, and their activity is further supported by Science and Technology (S&T) attachés in the area of ICT. We recommend that FTA and S&T attachés should receive further training and development in the area of investment promotion.

In the SSC selection process the consulting companies can help find appropriate locations. Finding the opinion leaders of these companies and building relationships with them can efficiently improve Hungary's chances on the SSC market.

5.3 Export of governmental digital solutions

5.3.1 The process

In line with international examples, in order to export governmental digital solutions, it is necessary to organise the entire export process:

- to assess competitive digital solutions and knowledge;
- to assess the needs of the target markets and identify their decision-makers;
- to ensure export capacity and cooperation between the participants of the public and the private sectors;
- to organise the market entry and exporting activity - to select opportunities with potentially high profitability rates and to continuously monitor and facilitate the process;
- to draw conclusions and recommend development opportunities accordingly;



5.3.1.1 Country report

At the first stage, it is necessary to assess and identify the target markets and countries of destination and, as a result, draw up a categorised list with a view to making the target markets and its gaps quickly and efficiently visible.

The categorised list will be prepared by the Hungarian National Trading House as well as the foreign trade attachés (FTAs) employed by the Ministry of Foreign Affairs and Trade.

In the second part of the first stage the above participants, under the leadership of the FTAs, prepare country reports for the Ministry of Foreign Affairs and Trade, in which they summarise in detail the information technological processes, shortcomings and solutions of the public administration of the nation concerned.

In addition to the above, the Hungarian National Trading House draws up a report which assesses the IT sector of the selected countries (East-South):

- national and international participants of the target market;
- what solutions are available to the specific IT problems.

The report will cover the IT development needs of the public sector as well. Concurrently with this work, based on the reports of students taking part in the Support Scheme for Gaining Experience in Foreign Public Administration and with the assistance of the appointed staff members of Bay Zoltán Alkalmazott Kutatási Közhasznú Nonprofit Kft., we are trying to get a more detailed insight into the IT sector of the selected country. The summary of these two points will make up the Country Reports on Digital Export.

5.3.1.2 Inventory of Domestic Solutions

In the second stage, domestic IT developments should be assessed and identified in the area of public administration and public services. In the first round the aim is to assess IT developments implemented and operating in the 2007-2013 programming period (central and national) based on predefined templates (provided by the Digital Success Programme) in order to ensure that the assessment follows a standard structure.

The first round will focus on EAOP (Electronic Administration Operational Programme) projects, of which data must be collected from the heads of the project consortium and the implementing organisations. Hopefully, this assessment cycle will provide a large amount of relevant information within a short time. The second round will focus on the IT developments of the current EU programming period (PACSDOP - Public Administration and Civil Service Development Operational Programme), during which information must be collected from the project officers and summarised as specified under the Digital Success Programme.

Parallel with the data collection, it is also necessary to set up an evaluation model so as to ensure that the data enquiries are recorded and analysed in an appropriate manner, structure, and quality.

After the data are collected, they must be summarised and analysed. After and based on the experience of the first round evaluation, further areas can be added to the scope of assessment.

It is necessary to assess the most significant Hungarian COTS IT products of the 2012-2015 period, with special focus on IT products which were granted the Hungarian Quality Product Award, with a view to getting a broader view of COTS products.

The product assessments need to be harmonised with the results of the innovation survey so as to see the entire spectrum both in governmental developments and on the markets of domestic COTS products.

The summary of these surveys will form the basis of the portfolio.

5.3.1.3 *Interdepartmental Committee for Digital Export Development (IC DEP)*

In the third stage, an interdepartmental committee must be set up under the State Secretariat for Economic Diplomacy of the Ministry of Foreign Affairs and Trade. The appointed chair is the deputy state secretary in charge of foreign economic affairs, other members are the Ministry of National Economy, the Ministry of National Development, the Hungarian National Trading House, Eximbank, Bay Zoltán Alkalmazott Kutatási Közhasznú Nonprofit Kft., Hipavillon, Design Terminal, the Hungarian National Media and Infocommunications Authority, and IVSZ.

The primary task of the committee is to coordinate the country reports and the Inventory of Domestic Solutions and to define the main objectives in order to provide decision-makers with promptly available and efficient decision-preparation materials.

5.3.2 Implementation of the export process

Measure: Designation of the export competence centre for governmental digital solutions

At present, the Hungarian public administration does not have an organisation which would be suitable for the comprehensive review and coordination of the export of governmental digital solutions. It is essential to designate an organisation which would carry out the following functions within the scope of the Digital Export Development Strategy:

- It needs to have an overall view of the portfolio of governmental digital solutions, focusing on the IT solutions and systems (EAOP) of the previous programming period, and must also be aware of the IT solutions planned for the current programming period (PACSDOP);
- It has to carry out and update an export capacity evaluation so as to be able to decide at an institutional level which international markets should the specific IT solutions be exported to and in what way;
- It is also necessary to gather current national and international experience and “good practices” so that market entry can take place in the most optimal way possible;
- It should build a communications channel with the competence centre in the middle, acting as a mediator. Communication among the businesses, governmental participants and foreign operators of IT solutions should also take place via this organisation. Efficient, high-standard communication (both in terms of professionalism and language competences) is of utmost importance during the export processes;
- The organisation has to enter into cooperation agreements with the potential undertakings (portfolio, target markets, project forms, financing);
- The organisation must prepare the implementation stage along the DEDS together with domestic consultancy companies;
- Specification of the organisation’s potential main functions:

- to support the preparation of IT projects;
- to classify countries by topic;
- to prepare and implement twinning programmes with eastern and southern countries.

Measure: Interdepartmental Committee for Digital Export Development (IC DEP)

Only with the coordinated knowledge and activity of the organisations involved can government solutions be exported efficiently. The competence centre is responsible for continuously updating the export pipelines and for collecting the arising problems and questions. The Interdepartmental Committee for Digital Product Export reviews the ongoing opportunities, makes proposals for applying for or restraining from new opportunities, summarises the experience gained and recommends further development directions and actions.

Measure: Drawing up and continuously updating the international IT problem map

It is necessary to create an International IT Problem Map (NIP) aimed at pointing out the various international IT problems and shortcomings and comparing them with domestic IT solutions that could effectively solve those problems. This requires the involvement of foreign trade attachés (FTAs), the staff of the Hungarian National Trading House, and other members of the diplomatic corps so as to assess the administration-related IT problems of the country concerned in detail and submit a summary report in the form of a country report to the Ministry of Foreign Affairs and Trade, which the institution set up by the DEDES will be able to make use of.

Measure: Hungarian library of digital solutions and knowledge (LDSK)

The LDSK (Governmental Information Technology Development Agency - GITDA) must be set up in a way that all IT developments need to be assessed and classified in the structure specified under the DEDES with a view to ensuring efficient problem solving based on the FTA reports. In addition, a database of public administration know-how that is outstanding also in international terms must be collected. At this early stage, this knowledge can serve as a basis on the target market for persuading decision-makers who are responsible for the area to reach the best possible position in the preparatory phase of the projects.

5.3.3 Improving the export capacity

Measure: The work of civil servants as export specialists

It is necessary to create conditions that enable civil servants to officially participate in the export projects concerned. To this end, the following essential requirements must be fulfilled:

- specification of the legal/contractual terms of the export projects;
- establishment of the remuneration system;
- setting up and communication of the motivation system at individual and institution level;
- creation of the substitution system;
- promotion of acquiring technical and professional English language competences.

Measure: Creating export opportunities for new digital solutions

In the case of each IT system developed with the support of EU funds it is necessary to examine the ways in which it can be resold.

As for new governmental projects supported by the EU (e.g. PACSDOP), an examination must be carried out to see if the newly developed solution will be innovative/valuable for the purposes of export, and if so, the export capacity (IP rights, supplier's motivation) must be integrated into the evaluation system of the projects as an evaluation criterion (PACSDOP rules of procedure).

The financing of both the centre and the specialists must be provided during the pre-sales processes. This involves expert cooperation, an exchange of experience and the preparation of in-depth studies.

Measure: Establishing cooperation between governmental and market organisations

The main priority concerning the pillar of the strategy that deals with the export of governmental solutions (ICT EGS) is that the governmental participant must sell domestic ICT solutions in the foreign public administration sector. In most cases, this is impossible to implement without the involvement of Hungarian companies which contribute to the export process as subcontractors or performance agents. The involvement of these companies is subject to a public procurement procedure under the Public Procurement Act, so this process may carry risks and timing problems. In order to do this in compliance with the currently effective legislative requirements within the shortest possible time and at the fewest possible risks, the ICT EGS recommends the following solution:

The governmental participant should conclude framework agreements with private entities who have come up with relevant ICT solutions so as to reduce the open public procurement procedure, which may take up to half a year, in terms of time and risks.

Measure: Support Scheme for Gaining Foreign Experience in Foreign Public Administration

At the Faculty of Science of Public Governance and Administration of the National University of Public Service it is necessary to build a support system to make sure that students with language competences as well as with knowledge in the areas of IT and public administration can get familiar with the public administration processes and the IT problems and solutions of the target countries specified by the DEEDS. The primary purpose of the support is to enable students to partake in the preparation of the country reports with a view to increasing their quality and usability.

Measure: Building a network of expat relations

The international export studies highlight the importance of local knowledge and the network of relations. At present, Hungary does not exploit the assistance of Hungarian citizens working abroad and does not keep in touch with former students who acquired their higher education qualification in Hungary. Therefore, our recommendation is to build an alumni system, focusing on the target countries of the export of governmental solutions.

Measure: Promotion of innovation with the pre-commercial procurement tool (PcP)

PcP is a type of public procurement procedures which support innovation, a method and tool for reducing costs, increasing efficiency, and strengthening innovation from the demand side. Through public-private partnership (PPP), the procurement procedure, which is based on risk-benefit sharing, facilitates the establishment of new technologies, products or services that offer state-of-the-art solutions to the problems of public institutions or public service providers. During the four-stage process of PcP, the institution obliged to conduct the public procurement initiates the development of technological solutions (at least 2). The outcome of the PcP should be a development which satisfies mass needs – i.e. does not only address individual demands – and which is available to anyone. The governments and local municipalities are the largest consumers on the European procurement market, so it is a priority objective of the European Union to encourage public procurement procedures that support innovation. This opportunity can largely contribute to enabling new prototypes, products or services that have no reference to try themselves in these public procurement procedures.

6 Comprehensive Measures

6.1 Provision of Human Resources - Digital Labour Programme

In order to increase digital export, it is an essential need to speed up the training of IT specialists with the following targets:

- within 3 years;
- 20,000 more IT specialists must be trained;
- in addition to the current training level.

(persons)	2017	2018	2019 ⁷	Additional training requirement/person
Higher education	5,384	5,384	5,384	
Additional requirement in higher education	0	500	3,000	3,500
Vocational education	2,236	2,236	2,236	
Additional requirement in vocational education	0	1,000	2,000	3,000
Other	1,000	1,000	1,000	
Other additional requirements	1,500	5,000	7,000	13,500
Total surplus:				20,000

According to the calculations of the Secretariat of State for Education of the Ministry of Human Capacities, based on the current trends between 2017 and 2019 the number of additional students to be admitted to higher education will be as follows:

(persons)	2017	2018	2019 ⁸	Additional training requirement/person
Additional training requirement in higher education	300	500	1,000	1,800

* The additional numbers in higher education are industry-specific targets, it is therefore not advisable to use them in respect of national and EU programmes as indicators that are verifiable or subject to the calling of funds.

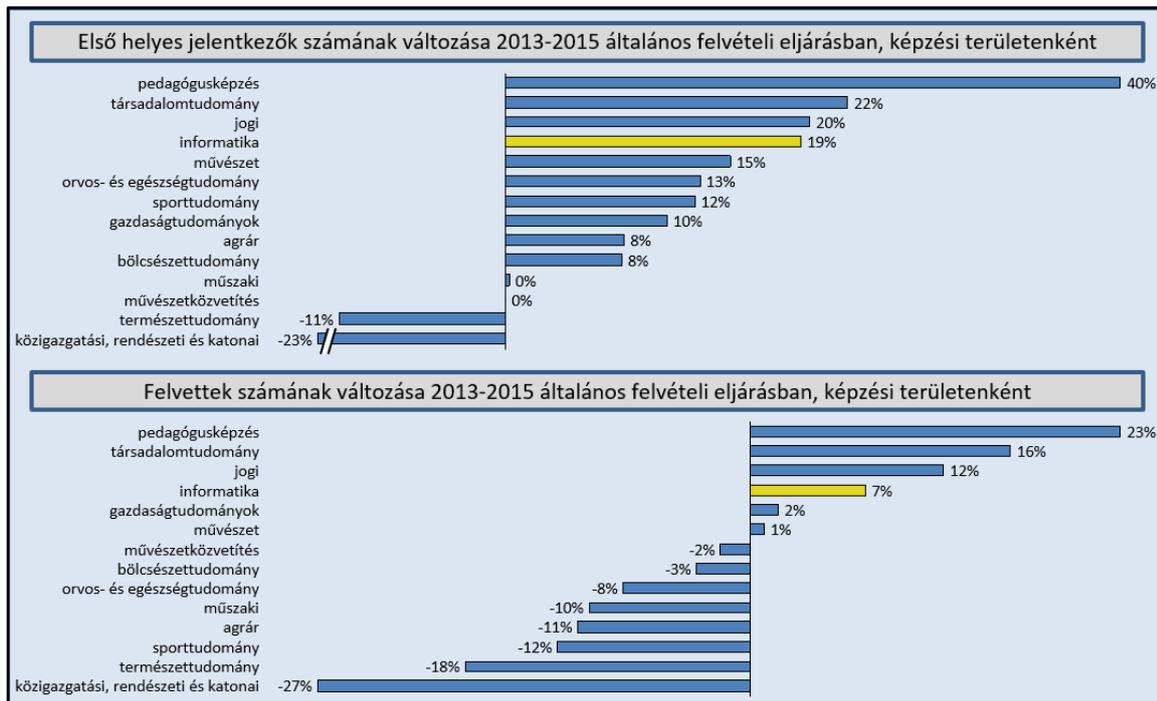
⁷ After the target has been met, it is necessary to evaluate the result of the intervention and reassess labour market needs. Depending on the results, the programme may be continued, extended or closed. The need for the programme is justified by the fact that the output reaction time of traditional training forms is longer than the planned time frame of the intervention, so the programme must focus on short-cycle training courses.

⁸ After the target has been met, it is necessary to evaluate the result of the intervention and reassess labour market needs. Depending on the results, the programme may be continued, extended or closed. The need for the programme is justified by the fact that the output reaction time of traditional training forms is longer than the planned time frame of the intervention, so the programme must focus on short-cycle training courses.

There has already been a huge need for IT specialists at the level of the national economy. In the short run, neither in terms of quantity, nor content are the traditional VET and higher education systems able to meet this need. For this reason, the first, experimental stage of the Digital Labour Programme focuses on non-traditional training programmes with lead times that are longer than the target period. The capacity of traditional training systems can be increased after their content renewal. For example, higher vocational training programmes (the total annual output of which is only 690 persons now) can take over a significant share of the satisfaction of labour market needs from other forms of training.

6.1.1 Target groups

In the wake of demographic trends, the number of applicants to the IT courses of traditional training systems is stagnating and is expected to decline in the coming years. The number of admitted students cannot be raised until their ratio within the total population of applicants increases (8% at present). This, however, requires motivation for applying and higher admission capacities. Although the number of applicants has grown to some extent in the past years, the admission quota has been increased only to a limited rate.



Number of applicants and admitted students in 2013-2015 Source: Felvi.hu

Első helyes jelentkezők számának változása 2013-2015 általános felvételi eljárásban, képzési területenként	Change in the number of first place applicants in 2013-2015 in the general admission procedure, by training field
pedagógusképzés	teacher training
társadalomtudomány	social sciences
jogi	law
informatika	information technology
művészet	arts
orvos- és egészségügytudomány	medicine and health science
sporttudomány	sport science
gazdaságtudományok	economic sciences

agrár	agricultural sciences
bölcsészettudomány	humanities
műszaki	technology
művészetközvetítés	art education
természettudomány	natural sciences
közigazgatási, rendészeti és katonai	public administration, police and military training
Felvettek számának változása 2013-2015 általános felvételi eljárásban, képzési területenként	Change in the number of admitted students in 2013-2015 in the general admission procedure, by training field
pedagógusképzés	teacher training
társadalomtudomány	social sciences
jogi	law
informatika	information technology
gazdaságtudományok	economic sciences
művészet	arts
művészetközvetítés	art education
bölcsészettudomány	humanities
orvos- és egészségtudomány	medicine and health science
műszaki	technology
agrár	agricultural sciences
sporttudomány	sport science
természettudomány	natural sciences
közigazgatási, rendészeti és katonai	public administration, police and military training

However, in order to reach the ambitious target numbers of the Digital Labour Programme, it is not enough to address the target groups of the traditional training programmes, in fact, **DLP does not aim at the cannibalisation of the target group of existing training schemes**. The new target groups with potential reserves:

- students not admitted to or dropped out of higher education;
- women;
- those living in the country or in areas from which there are no or hardly any applicants to IT training;
- career changers.

6.1.1.1 Students not admitted to higher education

The number of students who are not admitted to higher education IT courses is some 1,500-2,000 annually. In addition, about 2,000 students drop out of higher education courses annually. A significant part of these students still opts for an IT career, but they need a different type of training, not what higher education offers.

6.1.1.2 Women

Only 8% of women study information technology in higher education, which means there is considerable potential at the society level. Based on experience (e.g. Green Fox Academy, CodeCool), they can be involved at a higher rate in alternative forms of training.

6.1.1.3 Involvement of blank spots from rural areas

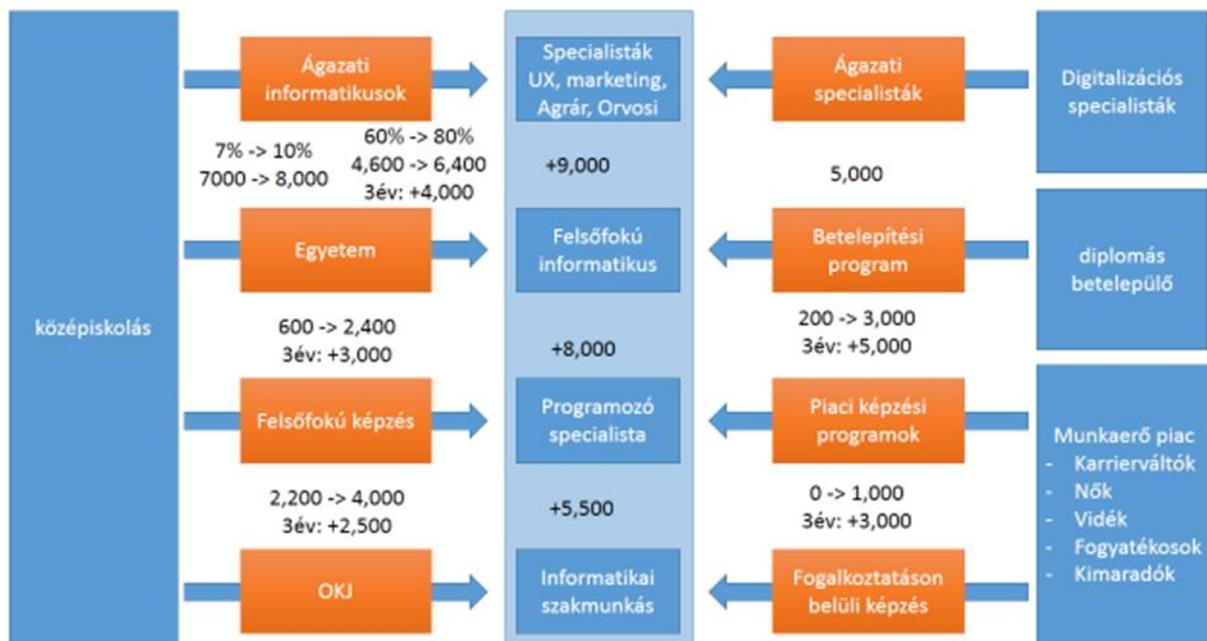
The choice of IT training basically depends on the previous stages of education, primarily on the primary and secondary schools. There are some institutions where the number of students applying for IT training is below the average or even zero due to the lack of sufficient motivation and career orientation. By means of appropriate interventions, the proportion of those interested in information technology could be increased in these areas.

6.1.1.4 Career changers

As the structure of the economy is continuously changing, employees are gradually switching to IT jobs from the less attractive professions. This trend can already be noticed and is expected to accelerate in the future, thus providing the largest base for the Digital Labour Programme. It is of key importance for these people to have access to flexible forms of training as well as to sustain and keep their already established livelihood also during the period of retraining. Based on market feedback, the career change can take place practically from any profession, particularly affecting the ones from which human resources have been or will be driven out by the newly emerging technologies (e.g. logistics, truck drivers, taxi drivers, etc.).

6.1.2 Tasks

The traditional VET and higher education systems are unable to meet, neither in terms of quantity, nor content, the need for training the number of specialists that would be necessary for market expansion. Therefore, in addition to traditional forms of training, the shortage of IT staff can be mitigated by means of on-the-job training programmes and by relocating companies specialised in training and qualified workforce to Hungary. We recommend that the harmonised development of traditional and business training programmes should be coordinated within the framework of the Digital Labour Programme. In order to implement this programme, it would be necessary to carry out several interrelated projects simultaneously and to make the required resources available.



Review of the Digital Labour Programme

középiskolás	Secondary school students
Ágazati Informatikusok	Sector-specific IT specialists
Egyetem	University
Felsőfokú képzés	Higher education
OKJ	NQR

Specialisták UX, marketing. Agrár, Orvosi	Specialists UX, marketing Agriculture, Medicine
Felsőfokú informatikus	Graduate IT specialists
Programozó specialista	Programming specialists
Informatikai szakmunkás	IT skilled workers
Ágazatspecialisták	Sector specialists
Betelepítési program	Relocation programme
Piaci képzési programok	Market training programmes
Foglalkoztatáson belüli képzés	On-the-job training
Digitalizációs specialisták	Digitalisation specialists
diplomás betelepülő	Graduate immigrants
Munkaerő piac-	Labour market
Karrierváltók	- Career changers
Nők-	- Women
Vidék-	- Rural areas
Fogyatékosok	- People with disabilities
Kimaradók	- Dropouts

The transfer of up-to-date technological knowledge is a social interest which cannot be limited to those few people who can afford to pre-finance their participation in training. Sharing and assuming the costs of training courses, especially general-purpose ones, is a governmental and community task, the established forms of which are widely available in respect of state accredited training such as free courses, student loans, subsidised adult education, etc. The integration of new technologies and forms of training into the scope of subsidised courses, however, is a slow process and lags far behind labour market demands. In general, the following forms of support should be provided to participants of training courses to make sure their participation does not depend on their social or financial circumstances:

- Partial or full financing of the training fee;
- Payment facilities such as student loan programmes;
- Sharing the fee between the employee and the employer;
- Living allowance during the training period;
- Reimbursement of expenses (e.g. travel) arising in connection with participation in the training course.

In order to make it possible for a wider scope of social groups to acquire knowledge that enables them to make a living also in the long run, it is necessary to compile and provide an aid package from the above items – depending on the labour market status and the nature of the training – throughout the period of implementation of the programme.

Measure: Developing the DLP knowledge base

- Specifying labour market needs: annual representative survey concerning the expected supply of labour as well as the content and level of their knowledge.
- Developing employment data collection with a view to identifying digital labour market requirements: Improving NAV and Central Statistical Office data collection and modifying the content of regular data disclosures in order to support the DLP, the DWP, and the digital economy in general.

- Developing a labour market feedback system: linking employment data with training data to enable the tracking of the effectiveness of training programmes.
- Updating industry structure forecasts: keeping industry structure forecasts with obsolete content and methodology up-to-date so that such forecasts can meet the needs of the digital economy as well.
 - o Departments in charge: Ministry of National Development (MND), Ministry of National Economy (MNE);
 - o Potential implementing organisations: NSZFH (National Vocational and Adult Training Agency), MKIK (Hungarian Chamber of Commerce and Industry), IVSZ (Hungarian ICT Association);
 - o Method of implementation: priority project;
 - o Financing requirement: HUF 100 million (Economic Development and Innovation OP (EDIOP) 3.1.1);
 - o Term: 1 year.

Measure: Launching a DLP in-service training programme

By developing an in-service training programme with shared financing, a broader group of applicants can be attracted to IT training courses. This programme, which directly connects the short-cycle training with employment, provides assistance to those who have dropped out of higher education for any reason as well as to career changers by reducing the risks of both the employee and the employer, thus promoting employment and training to fill the gap in the IT industry.

The DLP in-service programme is based on short-cycle trainings which have already proved successful (in the form of on-the-job training programmes) in training IT specialists in certain areas of information technology including, in particular, those struggling with the greatest labour shortage.

Within the framework of this programme the applicants are admitted to a company that has joined the programme after a pre-filtering procedure carried out by the employer. They take part in full-time employment for at least 6 months. The training is practice-oriented and is tailored to the needs, profile and existing operation of the host company. The trainee signs a contract with the host company for – at least – further 2 years of employment after the training period. If the trainee quits the job at his/her own discretion, he/she must repay the training costs and the wage received during the training period on a time-proportional basis. Host companies must employ at least 20 trainees in each training cycle.

Activities:

- Input filtering for the preliminary assessment of knowledge and motivation;
- Provision of English language training;
- Development of basic skills (communication, presentation, problem-solving);

- IT training;
- Coordination of the DLP in-service training programme (tracking applicants and host companies).

Financing	Trainee*	Host company***	Grant****
Input filtering**	100%	0%	0%
In the case of disadvantaged areas or persons	50%	0%	50%
In the case of multiply disadvantaged persons	5%	0%	95%
English language and basic skills training	50%	25%	25%
In the case of disadvantaged areas or persons	25%	25%	50%
In the case of multiply disadvantaged persons	5%	25%	70%
IT training	50%	50%	0%
In the case of disadvantaged areas or persons	25%	50%	25%
In the case of multiply disadvantaged persons	5%	50%	45%
Wage during the training period*****	0%	75%	25%
Wage after the training period	0%	100%	0%

*The fee payable by the trainees is deducted from the wage they receive after the training in equal instalments, free of interest, over a time span of 2 years. The interest-free loan is financed by the host company.

** The fee of the input filtering must be paid in advance.

*** If the trainee drops out of the training for any reason beyond his/her control, the training costs will be repaid to the host company in the form of a grant.

**** The amount of the grant will be repaid to the company after the training is completed.

***** The wage subsidy can be combined with other employment benefits.

- Departments in charge: MND, MNE;
- Potential implementing organisations: NSZFH, IVSZ;
- Method of implementation: priority project (EDIOP), tenders for business entities;
- Term: 3 years.

Measure: DLP market-based ICT training programme

In response to the shortage of ICT staff, short-cycle market-based training courses mainly providing specific programming knowledge have appeared. The cost of the training is financed – in the framework of a study contract – by the contractor in the form of a job placement fee payable to the future employer, the work performed during the training period, and a certain proportion of the wage earned after the trainee takes on the job. Based on experience, these training courses are the most popular among career changers. This form of training effectively helps to mitigate the quantitative problems arising from the shortage of IT specialists. The growth of the programme is basically limited by the financing capacity of the training organisations and the financial situation of the trainees. The proposal aims to eliminate these restrictive factors:

- the activity of the training organisations should be VAT-exempt;
- an appropriate guarantee fund should be made available to training organisations as a financing aid;
- trainees should be provided a travel allowance to facilitate their participation in training;
- trainees should receive unemployment benefit during the training period;
- the admission of training organisations to the programme should take place via application to be evaluated by a professional committee comprising at least 1 governmental and 1 NGO member. The evaluation criteria should be elaborated on the basis of existing good market experience.

The experimental programme runs over a 5-year term, which can be extended. The training organisations participating in the experimental programme will be exempted from the legislative conditions applicable to adult training.

- Departments in charge: MND, MNE;
- Potential implementing organisations: NSZFH, MKIK, IVSZ;
- Method of implementation: priority project (EDIOP), tenders for private individuals;
- Financing requirement: HUF 1.2 billion (EDIOP); HUF 6 billion (tenders, EDIOP);
- Term: 5 years.

Measure: Development of IT training in higher education

- To remove capacity volume restrictions;
- To renew training content: to integrate up-to-date, industry-recognised training modules and qualifications in training courses, thus replacing obsolete training elements;
- To increase the up-to-date knowledge of the teaching staff: to make the master instructor programme more reasonable and raise instructors' wages to a considerable extent;
- To introduce a normative premium: the university should receive once again half of the normative amount due after each graduate IT student (Dutch model).
- To remove the IT tool procurement stop;
- To launch interdisciplinary training with a view to supporting the use of information technology in other sectors;
- To strengthen the relationship between universities and IT companies: (EDIOP 3.1.1 - Competitive Central Hungary OP (CCHOP) 15).
 - Implementing organisations: GITDA, IVSZ, MND

- Method of implementation: priority project (EDIOP 3.1.1.), tenders, amendment of legislation;
- Term: 3 years.

Measure: Development of vocational education and training

- To increase the number of students in vocational IT training;
- To review and renew the content of vocational IT training;
- To elaborate and introduce IT modules in non-IT professions;
- To modernise the system of tools of vocational IT training;
- To renew the teaching staff and make the vocational training career more attractive;
- To strengthen the relationship between IT companies and vocational training institutions and extend practical training and traineeship programmes.
 - Departments in charge: MND, MNE;
 - Potential implementing organisations: NSZFH, MKIK, IVSZ;
 - Method of implementation: priority projects (EDIOP), tenders, amendment of legislation;
 - Financing requirement: HUF 6 billion (EDIOP) in the case of priority projects aimed at the renewal of vocational training content.
 - Term: 3 years.

6.1.3 *Expected outcomes of the DLP*

	Intervention	Additional training during the 3-year term
Additional requirement in higher education	Development of IT training in higher education	7,000 people
Additional requirement in vocational education	Development of vocational education and training	2,500 people
Other additional requirements	DLP in-service training programme DLP training programme	13,000 people
Total:		22,500 people

6.1.4 *Improving the quality of education*

Measure: Creating a business framework at universities

The current remuneration of the academic staff and the restriction on the procurement of technical equipment makes high-standard education impossible. At the same time, the

industry requires opportunities of cooperation with the market for the use of special digitalisation knowledge more than ever. This cooperation must be made transparent and simple. It is necessary to create a form of business at universities which enables:

- cooperation between the industry and the university on a market basis;
- the transparent financing of teachers;
- a related revenue for the university.

Measure: Diploma Premium

Today, university faculties are not subject to a direct market testing. On the grounds of university autonomy, they often tend to transfer obsolete knowledge while students do not get the knowledge which would be necessary for competitiveness and which the industry expects. Consequently, an excessive number of students give up their studies and start working with insufficient knowledge, which would later prevent them from being able to perform more complex jobs. The diploma premium introduced in other countries (the Netherlands) supports the internal development processes of the university, including the process of curriculum development, as an incentive. We suggest that the diploma premium (+50%) should be introduced as a form of training support.

6.2 Measurement of the Digital Economy and Export

Digital export depends on the development of the domestic digital economy from two aspects.

Firstly, in order to effectively launch an exportable product or service, it must be “validated” or tried in real, actual business processes. Therefore, there is greater chance of producing exportable Hungarian products in sectors that are leading segments of the economy also in Hungary and where undertakings operating in the sector can keep pace with the leading international players. Thus, it is of key importance to prepare regular reports on the digitalisation of the Hungarian economy.

Secondly, the export performance is highly influenced by the availability of labour with ICT and sector-specific IT knowledge. It is essential that training can keep up with the needs, otherwise exporting companies will have to compete for labour not only with foreign companies, but also with domestic non-IT undertakings, which inevitably leads to the emergence of a wage spiral and the deterioration of export competitiveness.

Based on the above, in order for the DEEDS to be successful, it is recommended to elaborate a framework for the measurement of both digital export and the digital economy.

Measure: Elaborating a method for the measurement of digital export (ICT software and services export)

In the currently available standard export reports it is not possible to measure ICT software and services export – including digitalised business services – separately. To find a solution to

this task, it would be necessary to prepare a report containing an accurate description of the area, the export volume, the export share, the target countries, and the workforce of the exporting companies.

Measure: Elaborating a method for the measurement of the digital economy

At present, there is no approved methodology for the measurement of the digital economy. The comparative figures presented in the European Union's DESI⁹ and World Economic Forum: Global Information Technology Report¹⁰ serve as so-called comparative index in respect of the level of development of the digital economy, but neither of these reports measure the digital economy in terms of GDP and job number. Based on international experience and the results of the IVSZ-Századvég survey, it is recommended to prepare a report on the Hungarian digital economy, which would possibly present the size and the staff requirements of the digital economy by sector.

⁹ Digital Economy and Society Index (European Union, 2016) (Európai Unió, 2016)

¹⁰ Global Information Technology Report (World Economic Forum, 2016) (World Economic Forum, 2016)

References

Europai Unió. (2016). *Digital Economy and Society index*. Forrás: <https://ec.europa.eu/digital-single-market/en/desi>

IVSZ. (2015). *IVSZ szoftver- és szolgáltatás export kutatási jelentés*. Forrás: <http://ivsz.hu/projektek/export-kutatas-ivsz-export-guide/>

IVSZ-Századvég. (2015). *Az IKT szektor gazdasági lábnyoma - A digitális gazdaság mérésének új módszertana*. Forrás: <http://ivsz.hu/projektek/digitalis-gazdasag-merese-kutatas/>

KPMG. (2016). *Global Automotive Executive Survey 2016*. Forrás: <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/01/gaes-2016.pdf>

World Economic Forum. (2016). *Global Information Technology Report*. Forrás: <http://reports.weforum.org/global-information-technology-report-2016/economies/#economy=HUN>