Joint Project Idea Synopsis

Framework:

- “Public Health” programme of the Norwegian Financial Mechanism 2009-2014

Project:

- HU12-Bilateral Action - 1 Exchange of experience and partnership programs in the field of innovative e-health solutions to promote early diagnosis of cancer

Call:

- E-health based innovations in pathology to promote early diagnosis of cancer - Exchange of experience and developing strategy plan and competence development programs to implement digital pathology in consultation practice and intraoperative pathology telediagnostics - HU12-0002- Action 1-2017

Program Operator

- National Healthcare Service Center, Hungary

Project Promoter

- Semmelweis University

Project Partner

- Hungarian-Norwegian Chamber of Commerce

Project period:

- 1. September - 31. October, 2017.

Experties of the Project Promoter

- László Fónyad
- Attila Fintha
- Tibor Glasz
- Tamás Székely
- Tibor Krenács

Indicators reached by this document:

Indicator	**Expected value**	**Reached value**
Number of joint project idea synopsis	1	1

RESULTS OF THE PROJECT

Study tour

Meeting:

- Norwegian - Hungarian e-health technology forum

Date:

- 10 - 14 October, 2017.

Location:

- Oslo, Norway

Venue:

- Telenor headquarter

Participants:

- László Fónyad
- Attila Fintha
- Tibor Glasz
- Tamás Székely

Contact persons:

- Anna Gyüre Szamosi
- Klára Jankovics

Indicators reached:

Indicator	Expected value	Reached value
Number of Study Tours	1	1
Number of participants in Study Tours	min. 4 persons	4

Brief description of the Study tour:

The Hungarian-Norwegian Chamber of Commerce (Norway) and Infotér Association (Hungary) had organized a conference in e-health, IoT and in digital transformation related to healthcare in Oslo, Norway between 10-14 October, 2017. Internationally recognized experts on their field lectured during the meeting.

After Her Excellency Anna Mária Sikó, Ambassador of Hungary to Norway and Albert Bíró, secretary general of Infotér Association welcomed the audience, Svein Bognar, deputy chairman of the Hungarian-Norwegian Chamber of Commerce introduced the activities of the Chamber.
In her keynote speech, Trine Radmann, head of international affairs, Norway Health Tech talked about Smart Solutions for supporting the Digital transformation in healthcare. Dr. Naeem Zahid Ph.D., Senior Business Developer eHealth, Telenor Group had his lecture on eHealth, summerizing its definition, pitfalls and challenges also talked about future trends and Telenor in eHealth. Dave O'Shaughnessy, Healthcare Practice Leader, EMEA Region Avaya Inc. highlighted a different perspective of eHealth with his talk: Is Healthcare ready for the Patient 2.0? Patient Experiences in the Digital Healthcare Era. Salwa Rafee, Healthcare & Life Sciences Security Business Leader, IBM, emphasized the importance of data safety and integrity in her lecture about How could technology support regulation? Mihály Zala, Executive Director, Cybersecurity Services Ernst&Young Hungary, have summerized the key aspects of the new reugulation of the European Union on General Data Protection (GDPR) and the compliance with Regulatory and Patient Privacy Requirements. Laila G. Hagen, Leader Health, Follow-up Center, Dignio in her lecture The personal connected health and care in central Oslo project Presentation of Dignio's solutions talked about how eHealth solution are implemented in real life practice of home care services. Ádám Balogh, Senior Business Development Manager, Attrecto Next Tech Digital Solutions introduced a solution for electronic patient management implemented in a Hungarian private clinic. Johnny Hermansen, senior systems engineer Extreme Networks talked about smart networking solutions for healthcare institutes.
The Study tour contained a formal visit to The Intervention Center of Oslo University Hospital (http://www.ivs.no/). After a short tour in the hospital colleagues of the Center lectured about their recent innovations in the field of MR guided intervention and surgery, robotics and simulations, having a special focus on the HoloViz project that gives surgeons the possibility to plan operations better by use of Mixed Reality-technology where medical images are provided in 3D and represent organs of specific patients before complex procedures.

Bilateral actions taken:

Extensive discussions were performed about the information technology both in the hungarian and norwegian health care systems, especially about the information technological details and further strategic possibilities. Within these we analyzed experiences of an already existing and on-going, well coordinated swedish-hungarian pathology diagnostic cooperation between Karolinska University,

Stockholm and Semmelweis University, Budapest and forbade a future possible telepathology interaction between Norway, Sweden and Hungary. Also, with regional extension of contacts of these lands we depicted the future idea of an interacting Nordic and Central-European (Visegrad-4) telepathology network.

Important hungarian stakeholders taking part in this visit were consulted by us in various and repeated discussions about the general e-Health developmental situation in Hungary with special respect to the nationwide interhospital informatized network (EESZT - “Electronic Health Service Space”) currently under wide-scale introduction and to the possible implementation of a pathology dedicated subset thereof. Further discussions were undertaken with representatives of various sized hospitals in order to seek means to implement bi- or trilateral informatized pathology department-based telecontacts as a pilot system for a more expanded network under EESZT. Key organizer “INFOTER” general secretary Mr. Biro was equally included to these discussions and possibilities to transfer information to high-level hungarian politicians were considered.

Future plans:

Representatives of the Semmelweis University together with the Project partner - HNCC agreed upon the following long term key plans for bilateral partnership:

- To facilitate the ongoing support of the Norway Grant of eHealth developments in Hungary focusing on the implementation of telepathology solutions by integrating such programmes in order to help preparing for future calls of the Norway Grants by means of communication of our strategy plan of building up a telepathology network in Hungary to relevant stakeholders, such as negotiators of the Hungarian Government, Norway Grants and to representatives of the Ministry of Foreign Affairs and Trade of Hungary and Norway’s Ambassador to Hungary.

- HNCC would facilitate further partnership agreements between Semmelweis University and Norwegian academical partners by ongoing support in contacting digital pathology experts.

- Both parties would communicate high end Norwegian or Hungarian innovations in the field of digital pathology with the potential to implement those either in Hungary or in Norway. Potential partner identified in this activity is the Norway Health Tech whose aim is to create sustainable solutions for the major global health challenges, by strengthening competitiveness and facilitating strong growth in the Norwegian healthcare industry and expanding international cooperation.

Satellite symposium

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of Satellite Symposium	1	1
Number of participants in the Satellite Symposium	expected 60 persons	116 pathologists 24 pathology assistants

Title:

- Digital pathology solutions in everyday practice

Date:

- 29 September, 2017.

Location:

- Siófok, Hungary

Venue:

- Prémium Hotel Panoráma

Speakers and titles:

- László Fónyad, Semmelweis University
    - Report on *HU12-Bilateral Action - 1 Exchange of experience and partnership programs in the field of innovative e-health solutions to promote early diagnosis of cancer* project
    - Automated image analysis of immunohistochemical reaction in the pathological evaluation of breast carcinomas
- Tamás Székely, Semmelweis University
    - Entering the era of full digitization of the pathology case
- Hajnalka Rajnai, Semmelweis University
    - The role of digital image analysis in neuropathology
- Birgit Ringelhan, Erzsébet Hospital, Sopron
    - Digital pathology in a rural hospital - pros and cons
- Tamás Regényi, 3DHISTECH Ltd., Budapest
    - Next generation slide scanners

Summary:

- Digital pathology solutions from the technical point of view are raedy to be implemented in routine practice when proper quality assurance systems are applied along. The key question is how can these new innovations be used to improve the quality of diagnostic work. The satellite symposium had been focusing on automated image analysis and the transformation of analog to a fully digitized pathology case handling.

Workshop

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of Workshops	1	1
Number of participants in the Workshop	expected 30 persons	116 pathologists 24 pathology assistants

Title:

- Introduction of digital pathology to the intraoperative frozen section examination

Date:

- 29 September, 2017.

Location:

- Siófok, Hungary

Venue:

- Prémium Hotel Panoráma

Speakers and titles:

- Tibor Glasz:
    - Theoretic introduction
- Tibor Glasz, Attila Fintha
    - Real time presentation and remote teleconsulation

Summary:

- The steadily decreasing number of pathologists and the ever-increasing need for pathological findings that contain more and more data require the use of new technical solutions that are now available in the digital pathology field.
- With the establishment of a digital pathology network, we are able to efficiently consolidate the expertise available in the country and thus enable pathologists working remote using telecommunication techniques.
- In the workshop, we will present modern digital pathology tools, which will allow for further training of assistants in the future, with the possibility of independent macroscopic preparation and processing of the tissue samples, supported by remote medical pathological supervision.

Project plan

A professional project plan to aid implementation of a nationwide digital pathology network in Hungary and to assist funding agencies in decision making and budget planning have been constructed.
The project plan includes a description of pathology as a special field of medicine and explains the role of a telepathology consultation network in order to reduce inequalities of the pathology service around Hungary and to improve quality of and access to health care services.
A whole chapter is dedicated to describe the current situation and challenges pathology is facing, including: analysis of the situation, justification of the intervention, stakeholder analysis, SWOT analysis, analysis of the legislative and bureaucratic environment, specially dealing with the new EU regulations of data projection (GDPR).
The project plan is focusing on practical issues of execution, including technical requirements, financial management, resource management and risk management of the implementation of a nationwide telepathology consultation network.
The project plan also gives a detailed schedule of the implementation when adequate resources are available, including technical innovations, procurement, implementation, education of users, etc.
Understanding the importance of good communication of the project to various stakeholders, the project plan has a detailed publicity plan as well.

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of guidelines and methodologies created	3	1/3

Competence development

In order to carry out intraoperative freezing teleconsultation pathology testing of tissue samples, it is necessary to specially train histotechnicians working in a pathology laboratory. This special training covers some activities that have traditionally been performed by a board certified pathologist (such as grossing), as well as the acquisition of skills that have not been part of conventional histotechnician educational topics applied to date. The latter, above all, involves the acquisition of skills in the field of computerized workflows, the use of new computer tools of pathology lab technology and telecommunication. Subject of this special training is the integrated understanding of otherwise singly used routine histological laboratory procedures, mastering of the standard procedures and the integration of these into computerized workflows. The standard procedure documentation includes the infrastructure and technology prerequisites needed for intraoperative freezing teleconsultation as well as the methodology and procedures to create digital images that can be evaluated by a remote pathologist in the framework of a teleconsultation.

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of guidelines and methodologies created	3	2/3

Quality assurance

Development and running of a digital slide-based dynamic telepathology network is a highly complex task therefore, its quality assurance requires the co-operation between pathologist, tissue technologists and the IT service, besides system standardization. The purpose of telepathology quality assurance is to monitor and reveal the critical points and unbalances of the system for allowing effective, in time interactions in order to support its safe running and continuous improvement.

The essential requirement of telepathology is the structurally and molecularly preserved pathology sample allowing the production of high quality stained slides. Only this can guaranty diagnostic utility through the support of artificial intelligence (computer technology) for digitalization and sharing for remote access through networks.

Therefore, quality assurance of a teleconsultation system should focus on the whole process, including pre-analytical, analytical and post-analytical procedures, high color fidelity and resolution digital representation of the samples, utility of software tools allowing sample analysis, integration of virtual samples to local databases, the conditions of diagnostic reporting, and the efficient uploading and downloading for remote access of the pathological samples. Quality initiatives should also focus on the validation of digital slides (smears) against traditional glass slides for diagnostic use, the competence of professionals involved,

and the diagnostic abilities of pathologists by utilizing organized interpretational schemes.

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of guidelines and methodologies created	3	3/3

Publicity

Indicators reached:

Indicator	**Expected value**	**Reached value**
Number of public and professional press appearances	4	8 appearances on 4 different sources

Our publicity plan was based on a stepwise approach, reaching interested audience first in our special niche later widening the scale of press appearances to more and more unspecific but on a broader level.

Keeping this in mind the following schedule was implemented:

- Reaching colleagues at the Departments of Pathology, Semmelweis University
- Reaching colleagues at the Semmelweis University
- Reaching members of the pathology society
- Reaching professional audience interested in eHealth and informatics
- Reaching the broad society

1. Under the umbrella of the official website of the 1st. Dept. of Pathology and Experimental Cancer Research, SU, a web pages have been created and 2 types of appearances have been edited:
    a. News page
        i. http://semmelweis.hu/patologia1/2017/10/16/a-semmelweis-egyetem-sikeresen-palyazott-a-norveg-alapnal/
        ii. At this level an informative article has been published summarizing the project
    b. Project information page
        i. http://semmelweis.hu/patologia1/exchange-of-experience-and-partnership-programs-in-the-field-of-innovative-e-health-solutions-to-promote-early-diagnosis-of-cancer/
        ii. At this level, in accordance with transparency directions the complete project description was published along with the budget of the project
        iii. This is the main source from where the created guidelines will be available to our audience
2. At university level a summary of the project has been published focusing on the role of Semmelweis University in further developing eHealth solutions in Hungary.
        i. http://semmelweis.hu/hirek/2017/10/24/tobb-mint-225-millio-forin

tot-nyert-az-egyetem-egy-orszagos-telepatologiai-halozat-alapjainak-kiepitesere/

3. Working together with Hungarian Society of Pathologists, memberof of the society have been reached in different ways:
    a. Newsletter
        i. http://sendy.kmcongress.com/w/B892pmYiLHdztV1wozEQDzSQ
    b. Appearance on the official website of the society
        i. http://pathology.hu/hu/hirek/1308/digitalis-patologia-szimpozium-es-workshop-a-73-patologus-kongresszuson
    c. Satellite symposium during the annual meeting of the society (see above!)
    d. Satellite workshop during the annual meeting of the society (see above!)
4. To reach public audience we have been cooperating with Webbeteg, the largest information portal in the field of health and medicine, having 1.2 million unique visitor with 7 million page downloads per month. In their portal a project summary has been published in a comprehensible manner.
    a. http://www.webbeteg.hu/cikkek/szovettan/21585/norveg-alap-palyazat

SUSTAINING THE RESULTS OF THE PROJECT, FUTURE PLANS

Based on the accomplishments of the project and the new, professional relationships that have been established, the following plans, possibilities for the further development of digital pathology in Hungary are presented:

1. Using the results of the project, and in particular the new guidelines for the implementation of the national telepathology network, the "National Digital Pathology Teleconference Network Project Project", as a digital professional strategy document
2. Pathological Informatics Experimental Laboratory Cooperation between Semmelweis University and Oslo University Hospital Innovation Center (http://www.ivs.no)
3. Pathological IT training
4. Enlargement of the Swedish Digital Remote Pathology Diagnostic Network (http://exdin.com) to Norway and Hungary
4. Harmonization of the pathological finding methodology between the Semmelweis University and the leading representatives of the Scandinavian region (eg Oslo University Hospital Pathological Unit, Karolinska University Hospital, Pathological Unit, Stockholm)
5. A modern communication protocol, the Shortest Path Bridging (SPB), has been introduced in the IT network of the Oslo University Hospital for the purpose of adapting to the Hungarian telepathology network
6. Suggesting the Digital Patological Working Group of the Society of Hungarian Pathologists (DPMCS) to extend DPMCS recommendations based on project results