HumanE AI:

Toward AI Systems that Augment and Empower Humans by Understanding Us, our Society and the World Around Us

Grant Agreement Number: 761758
Project Acronym: HumanE AI

Project Dates: 2019-03-01 to 2020-02-29
Project Duration: 12 months

D4.1 Organizational concepts and legal frameworks for European large-scale, bottom-up AI initiatives with input to Horizon Europe planning

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Date: Jan 6, 2020
Approved by: Paul Lukowicz
Type: Report
Status: Final
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Dissemination Level		
PU	**Public**	

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DOCUMENT INFO

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0.2 Document History

Revision		
Date	**Lead Author(s)**	**Comments**
04.01.2020	Paul Lukowicz	Draft
05.01.2020	George Kampis	Formatting and proofreading

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EXECUTIVE SUMMARY

This deliverable was originally intended to constitute an initial design for the operational procedures of the envisioned Flagship. In the current version, it summarizes the ideas and considerations that have emerged in the course of considering various ways to sustain and develop a large-scale Humane AI community in the absence of a Flagship. They are intended as recommendations for the funding bodies of the Union with respect to efficient implementation of large-scale long-term research initiatives in AI and similar fields.

1. INTRODUCTION. STARTING POINT: DYNAMIC FUNDING WITH INTERNAL CALLS

The HumanE AI preparatory action proposal was based on the observation that an operational Flagship follows two opposite funding models. The first one is a conventional RIA model with most of the funds "statically" assigned to partners for specific tasks defined in the DOW. In other words, it's a normal RIA just scaled up. According to the second, a Flagship works more like a funding agency than a RIA. It has a core group setting the agenda and distributing most funds through open calls. Both have their advantages but also significant limitations, especially considering the specifics of AI and the AI community.

The "scaled up RIA" model is not well suited to deal with a such a highly dynamic, extremely fast evolving field as AI. Even for a typical RIA with a 3- to 4-year lifetime, plus about 1 year from proposal idea to project start, new developments can make ideas and approaches defined at the time of writing not just outdated but often even plain obsolete. In a longer run, mechanisms for dynamic refinement of the research agenda and/or approach are indispensable. In other words, the proposal needs to define the broad research direction and expected results while the detailed research questions and approaches need to be continuously evolved and refined on the basis of both project internal results/insights and general developments in the field.

The above considerations have motivated the "funding agency" model in our case. Unfortunately, this only works within well defined, highly specialized communities. Within very broad, loose communities it is difficult to avoid extreme oversubscription of the calls and a dilution of the community. An example of a functioning "funding agency model" is the quantum technology Flagship. The ability to produce a proposal for a well-defined topic in quantum technology is limited to a manageable set of groups that are the community that the Flagship wants to address and keep together. By contrast, it is sometimes said that "anyone who can program *Python* and install *Tensor Flow* considers himself an AI expert". This means that open calls run the risk of being swamped by submissions creating huge overhead and making it difficult to build and maintain a focused community that has the right mix of competences and, most of all, the required scientific and technological excellence.

In the proposal we have put forward a concept for combining the above two approaches. This concept has been further developed during the preparatory action as detailed below. It is based on the following ideas:

(1) The backbone of a project is a relatively stable group of core partners recruited from top European AI groups in such a way that it includes adequate representation from all relevant communities and covers (at least at top level) all relevant competences. Such a stable core guarantees coherence, consistency and continuity over the course of the project. In a large-scale long-term initiative, 10-20% of the annual budget would be devoted to financing the core group activities with a focus on management, agenda setting, communication and integration of results.

(2) At the center of the S&T activities would be large network of excellent academic and industrial research groups (up to 100 organizations with up to 400 individual groups). The members of the network should, as basic funding, receive small contributions, mostly travel- and dissemination-oriented grants (for a total of 5-10% of the annual budget). In addition, they should have the right to apply for more significant research funds from the third pillar (see below). The set of institutions in the network should remain relatively stable, but should be subject to regular reviews and updates. Network membership could, for example, default to three years with the need to reapply afterward. This means that less active groups could be dropped, allowing emerging stars to join as new members. Thus, even in highly dynamic areas such as AI long running initiatives such as the original Flagships one could always ensure the participation of top groups in the field.

(3) Members of the network would be implementing the research agenda through medium-size and -length research projects granted through **competitive internal calls to network members** (about 60-70% of the annual budget). The calls would be made in accordance with the project long term research vision adapting it to the evolving state of the art. Thus, the calls would provide a bridge between the long-term vision and expected impact on one side and short-term developments both in the research field and emerging ideas and project results on the other. They would be driven by the core partners with input from the larger network, the community as a whole and the project officers. The calls should be lightweight and focused on scientific excellence, but they should include requirements and incentives to foster community building, exploitation, multiplier effects and other “political” concerns. Most projects should be collaborative between at least two network partners and require the inclusion of external partners to broaden the community (see 2.2 below). There should also be incentives (e.g., more funds, ability to apply for more projects) for aligning additional research around the calls (e.g., parallel applications to different funding agencies, PhD theses, etc.). Finally, various mechanisms All projects should have to present their results at regular plenary project meetings in addition to showing other success factors (e.g., publications, software, etc.).

2. FURTHER PROPOSED ORGANIZATIONAL CONCEPTS

In the course of the preparatory actions various additional ideas have been developed and refined around the above notion of dynamic funding through internal calls.

2.1 MICRO-PROJECTS: FUNDING A LARGE COMMUNITY WITH LIMITED FUNDS

In the course of the preparatory action the question aroused how, given limited funding only, a large community can not only be maintained in the sense of a classic networking activity but actually produce meaningful research results exploiting the synergies between the involved groups. The question was driven by the immediate need to sustain community built up for the Flagship call and leverage it for meaningful research with funding instruments order of magnitude below the original Flagship vision. As a solution we have come up with the notion of **collaborative micro-project**.

A collaborative microproject should:

- involve a small group of researchers (2–5) from **different partner institutions**
- Coming together to work together at **a single location** for a limited period of time (1–6 months)
- Aiming to solve a **well-defined problem** related to a specific scientific/technological challenge

Microprojects should always have to produce a tangible result, such as a scientific publication, dataset, toolbox, demonstrator, or integration of a toolbox. Microprojects should be situated within WPs devoted to different parts of the project agenda. Each WP must have dedicated funds for microprojects, which it can distribute through a lightweight internal proposal system based on quality and contribution to the WP agenda. Microprojects can be conducted between WPs (with each WP contributing part of the funds) and should have the possibility of including external partners through appropriate mechanisms (see 2.2 below).

The concept of microprojects has multiple advantages.

1. It is well-known that assembling a group of researchers at a single location with no distractions but a project they care about is highly effective. Thus, providing several partners with 6 person months (PMs) each to be used loosely collaborating on a 3-year project often produces little tangible results. On the other hand, if those 6 PM per partner are used to ensure that people from the respective groups spend a total of 6 months **being together at a single location** doing nothing else but working on a well-defined, joint project, then they can really accomplish something meaningful.
2. The collaborative aspect of microprojects—bringing together people from **different** partners—ensures that research can focus on breakthroughs and developments that **leverage the synergies** between the competences of the partners and would not be possible without the project. It is an essential component the vision of creating a "**multiplier effect**," where a relatively small investment represented by

the microproject creates a much larger effect. Thus, pieces of know-how distributed over different partner institutions may have little impact individually, but may amount to a significant innovation/breakthrough, with a value far beyond the funds invested in the microproject that gathered them.

3. As researchers go back to their institutions after the microproject, they will bring the results back with them, making them part of their future research (e.g., PhD work), sharing them with colleagues, and using them in proposals. This is another component of the multiplier effect, as the knowledge will help progress on each site, shape further research at each site, and lead to new proposals, including national and industrially supported proposals.

The above is an extremely effective mode of collaboration and an activity that creates strong, sustainable links not just on institutional but also on personal levels. Another advantage of the approach is that it combines three important concerns of most large scale, Europe wide research initiatives: (1) producing tangible results towards a specific research agenda, (2) strengthening links between various stakeholders Europe wide, and (3) spreading knowledge throughout Europe, **with the same funds furthering all three aims**.

2.2 CASE-BY-CASE INVOLVEMENT OF OUTSIDE PLAYERS

An important concern in large scale collaborative research initiatives is to involve researchers from outside the consortium in developing and implementing the research agenda whenever they either have competences not present in the consortium or when such an involvement is seen as beneficial to disseminate knowledge to all of Europe's AI community, to ensure visibility, to create outreach for European talent, and for capacity building in general.

A promising mechanism that has emerged from discussions during the HumanE AI preparatory action is to invite and finance the **participation of researchers from outside the consortium in project financed through internal calls**, including in microprojects. Thus, a proposal in response to a consortium internal call may include not only partners from the project, but also one or more external groups. The "external" partners would be financed from a dedicated pool of project funds just like the "internal" ones. In case of a micro-project an external researcher would be working on equal footing with researchers from the different core project partners at the respective location for either the entire duration or just part of the microproject duration. The project would finance travel, subsistence, and other costs (if needed, salary, depending on formal requirements and regulations). As an alternative, a microproject may be hosted by an institution outside the consortium.

Involving external partners in project internal calls has a number of advantages over a more conventional "Open Call" method of involving external partners. Open calls are a good method of using project funds to direct external resources toward certain aspect of the research agenda, bringing strong consortia into a loose collaboration with the project. However, open calls have a number of disadvantages:

- They involve significant overhead involved in the formal process, which means that they are not agile; not only in consuming resources for the process, but also being fairly slow (not too many open calls are possible in a 3- or 4-year project).

- The cooperation between the external open call participants and the consortium is not automatically very close. Each of the external projects is a consortium on its own, that may or may not intensively interact with the original project (beyond formal requirements). The contribution to spreading knowledge from within the consortium is limited. So are synergies between the core project and the open call activity.

- The method favors large external organizations that can address such calls with no way of involving excellent individuals (in particular, young researchers) who may happen to be part of smaller universities and organizations.

By contrast, the proposed method of involving external researchers in internal calls focusing has following advantages:

- The formal process is much more lightweight, with each cooperation consuming a smaller amount of resources. This is particularly true for microprojects. This means that a considerable number of corporations is possible within a 3- or 4-year project (for a 10-15 million initiative we estimate 50–100 microproject based collaborations could be possible).

- External cooperation can be initiated in a more agile way either in response to the emergence of new players in the field or to compensate missing competences with respect to a specific research question.
- Having an external researcher who spent a few months with a group of researchers from the consortium (as would be the case with a micro-project based collaboration) is a highly intensive form of collaboration, leading to a strong knowledge transfer and building of links not just on institutional but also on personal levels. Especially for young researchers, such a network building is extremely valuable.

- In particular, involving external researchers in microprojects allows focusing on individual excellence, reaching out to researchers not only at large institutions but to reach out to talent no matter where they are in Europe, and to help the talent develop and encourage talented researchers to continue their careers in Europe.

2.3 Cooperation with Industry

Industry involvement with focus on exploitation, technology transfer, and qualifications is a key concern in all European research initiatives. The mechanism proposed above opens two main possibilities.

2.3.1 Industrial Co-Sponsorship of Internal Calls

PPP (Public-Private-Partnership) based programs have recently gained a lot of traction with the Commission. The internal calls model described above allows flexible industrial involvement following the PPP philosophy as part of various size research projects. To this end, internal calls (both standard and micro-project oriented) could include industry co-sponsorship. Thus, the funds for the internal call would partially come from the project budget and partially from industry. The industrial call co-sponsor

could be a member of the consortium but it should also be possible to have industrial players from outside the consortium act as call co-sponsors on a case-by-case basis. Then, recruitment and selection of such external co-sponsors would be an important dissemination and exploitation activity. For consortium internal industrial partners, the right (and/or obligation) to co-sponsor and shape calls could be written into the proposal. For external co-sponsors the procedure for shaping the respective calls and the amount of influence that external co-sponsor would have to be carefully defined.

2.3.2 Industrial Participation in Microprojects

As described above, the idea behind microprojects is to bring together researchers from different institutions at a single location for a period of a few weeks or few months to work on a well-defined research problem. In terms of technology transfer and qualification of industrial personnel two aspects can be considered.

First, researchers from industry can participate in microprojects. These can be both researchers from industrial project partners and from outside the project (as the concept of microprojects includes outside participation as outlined above). Such a microproject participation is a unique opportunity for personnel from industry to be part of cutting-edge research and get first hand insights into new developments. Take can take them back to their R&D departments and exploit them with an understanding that is far beyond what conventional dissemination (demos, talks newsletters) measures could create. At the same time, closely and intimately working together with the academic partners the industrial researcher can provide with a unique perspective on the needs of industry and shape results to be more likely to have impact.

Second, industry can define and host microprojects. In general, such microprojects would be focused on applying basic research results developed in other project activities to use cases important to the industrial partner. Thus, the industrial partner (or an industrial player from outside the project) would provide the topic, a team leader and space for a group of researchers to work to implement a demonstrator or proof of concept solution for the user case.

3. LEGAL ISSUES AND RECOMMENDATIONS FOR HORIZON EUROPE

In summary, the key measures that we propose are

1. The use of internal calls to maintain an agile agenda and make sure that rapid advances on the field do not make the project plan obsolete

2. The notion of microprojects as am novel instruments that fosters very close cooperation and allows meaningful, tangible results to be achieved even in large networks with comparatively little available per partner resources

3. The inclusion of external groups through internal call mechanism (including microprojects), rather than through open calls.

4. The possibility of internal calls being co-sponsored by industry, both from within and from outside the consortium

All of the above require adjustments to the current EU program structure with respect to the proposal templates/structure requirements, the legal conditions and the financial conditions.

3.1 Proposal Templates/Structure Requirements

While internal calls and microproject are obviously related to WP structure of the project they are not the same as standard tasks and it is difficult to properly integrate the description of work that a project intends to do within such calls in the current structure. This is particularly true for large consortia that have strong focus on the networking aspect (e.g. in the past ICT 48 call) and thus want to rely very strongly on microprojects to produce tangible research results.

As a consequence, the workplan description should include a dedicated section for internal calls description including their relationship to WPs. Similarly, the WP forms should include dedicated structure to refer to internal calls and microprojects.

For internal calls and microprojects to be accepted as an integral component of Horizon Europe proposals and utilized by the community, the templates should provide clear guidelines how to define, establish and run them and how they will be evaluated.

3.2 Legal Conditions

In the current program, legal hurdles exist in particular with respect to the inclusion of external groups in the internal calls. Since the external groups are to be only included in a specific activity related to the internal call, they should not be made a full project partner through a contract amendment (which is very cumbersome anyway and it would need another amendment to remove them again). The only plausible legal way of including such external partners is currently through sub-contracting which however in many respects is not a well-suited instrument. Instead we suggest a legal framework should be created for becoming ”temporary partner” with rights and obligations restricted to the requirements of the specific activity they are involved with as part of a concrete internal call.

Another legal concern involves the procedures for the evaluation of the proposals for internal calls and the decisions about acceptance. Such decisions have financial consequences for the partners and create potential conflicts of interest.

Finally, legal boundary conditions, in particular with respect to IP and the influence that can be extended over the research direction, need to be specified for industry co-sponsored calls.

3.3 Financial Conditions

Related to the legal questions are financial constructs needed to implement internal calls, to be able to provide funds to external partners and process money from industrial co-sponsors. Thus, appropriate categories must be created within the budget tables and rules for handling the funds must be laid out. For example, funds assigned

to microprojects should only be used to pay for time spent at the respective location but then cover not only salary but also travel and subsistence. An important implication is the fact that partner budgets and the resources assigned to individual WPs will acquire a dynamic component dependent on the outcome of the respective internal calls.