

## CONSENSUS EVALUATION REPORT

### GENERAL OVERVIEW

Open Call Collection	OC-2016-2
Proposal Reference	OC-2016-2-21490
Proposal Title	<i>Developing and mainstreaming methods and tools for sensitivity analysis of mathematical models</i>
Proposal Acronym	DM-SAMO
Review Panel	<i>1. Mathematics, Physics and Computer Science to further fundamental knowledge and technological advances</i>
Evaluation Status	<i>Final</i>

### EVALUATION

#### SUMMARY TABLE

S&T EXCELLENCE					IMPACT				IMPLEMENTATION				Marks
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Total
4	4	3	4	4	4	4	5	3	5	2	4	5	51

### COMMENTS

#### S&T EXCELLENCE

Soundness of the challenge

Q1 - Is the challenge relevant and timely?	Mark
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: The proposal/challenge is relevant and timely. The proposer of the Action lists the reasons why at this time there is a need to address the specific challenge: uncertainty, rare and/or bad performance of Sensitivity Analysis in Higher Education and/or Research Institutions, dramatic differences between countries and practitioners.</p> <p>The proposal is well written. It indicates that the proposers have a good knowledge about the proposed topic. They also understand the specific of the Cost Actions. The included references are relevant scientifically and from the proposed topic point of view.</p> <p>The proposal would benefit from certain improvements: This proposal does not take into account some established research areas in Statistics which actually have been designed to address similar issues. The fields of Non-Parametric and Robust Statistics deal with such problems that the action participants want to investigate.</p> <p>In the first chapter it is mentioned the work of Robert Rosen as crucial in the ecological economics, but there is not presented any relevant citation of his work that confirms this affirmation. "As a result, an incalculable waste of resources takes place because modelers worldwide cannot give themselves a unified, reliable and agreed-on code of good practices for testing their models and the quality of the inference they produce. Unsurprisingly, the quality of</p>	4

model based inference has often been found wanting and “what is worse” problematic to assess.” Taking into consideration that was not page limit for the references, here was also appropriate the inclusion of some citations for a better support. Are there references (a review paper for example) that support the statements? Generally, it is more appropriate that the list of references to include some other relevant references.

<b>Q2 - Are the objectives presented clear and pertinent to tackle the challenge?</b>	<b>Mark</b>
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: This is the strong part of this proposal. The objectives of the proposed Action are appropriate. They are presented clearly with details. There are addressed the general objectives of the COST Program and also the specific objectives of the proposal. The objectives are intended to be measured in a quantitative way. The proposers of the Action exhibit a good experience in the subject of sensitivity analysis research and research coordination activities.</p> <p>The proposal would benefit from certain improvements: The proposers of the Action may give some examples when listing the objectives, i.e. terminology and taxonomy, open key questions, good practices etc. so as a potential MC candidate be clearly informed of the objectives of the Action.</p> <p>It is more appropriate to establish a clearer connection across all the considered scientific areas. In addition, it would be helpful to indicate more clearly how is planned to develop this field across sciences.</p>	4

Progress beyond the state-of-the-art and innovation potential

<b>Q3 - Does the proposal advance the state-of-the-art and introduce an innovative approach to the challenge?</b>	<b>Mark</b>
<p>The proposal addresses this question in a good manner.</p> <p>Main strengths: The general progress beyond the state-of-the-art is well presented. Some recent and representative reviews, journal special issues, textbooks, guidelines (in Europe and in the United States) and software for sensitivity analysis are mentioned. Some motivations for the proposing of this Action are presented. It is mentioned that there are some unresolved issues, whose solution requires joint analysis and joint deliberation among the practitioners. Some related questions to SA for whose solving is appropriate the Cost Action are presented. Specific questions related to the application of SA to large models in climate science, industry, and economics are mentioned.</p> <p>The proposal has some weaknesses and the following improvements are necessary: The proposal would like to advance the state of the art of the challenge by proposing the establishment of a new interdisciplinary field. But this does not have a very high innovation since sensitivity analysis exists as a branch of mathematics, that have many applications.</p> <p>The Action proposer needs to elaborate with more details on how is planned the establishment of the new discipline, the employability of the future researcher or practitioner in the field, and the harmonization with Bologna process as a new field of study.</p> <p>The proposal is not highly innovative, in that there is not a comparison of the proposed method with the existing tools. Moreover, it could be better outlined the progress beyond the state-of-the-art in the application of SA in climate science, industry, and economics.</p>	3

#### Added value of networking

Q4 - Is networking the best approach to tackle the challenge?	Mark
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: On the basis of the specificity of the proposed subject, its general nature, and many aspects that are proposed to be treated, a networking approach is particularly appropriate. In fact, many disciplines from engineering to medicine and from social science to economics are using Sensitivity Analysis. In addition, practitioners of Sensitivity Analysis are spread over many countries and research areas.</p> <p>A large, mostly European, group of people working on applied problems with emphasis on sensitivity analysis will be formed.</p> <p>The proposal would benefit from certain improvements: The benefits in terms of scholarship are not explained with enough details.</p>	4

Q5 - What is the added value of the proposed network in relation to former and existing efforts at European and/or international level?	Mark
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: There is well outlined in the proposal the necessity at worldwide, in Europe, United States, Canada, and China for sensitivity analysis. There is no specific effort on Sensitivity Analysis at the European Union level concerning national or European funded projects at present and therefore the proposed action can add value to any existing effort at EU level. There are no other significant group/societies related to this research area.</p> <p>The proposal would benefit from certain improvements: However, as this is a lively area of research, the proposers should describe more in details their strategy taking into account these activities.</p>	4

#### IMPACT

##### Scientific, technological and/or socio-economic impact

Q6 - Does the proposal clearly identify relevant, and realistic short-term/long-term impacts?	Mark
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: A scientific, technological and socio-economic impact will be achieved through the support of the necessary engineering skills, in order to minimize industrial uncertainty and improve the decision-making process during the design phase of a product. Short term impact will be achieved through the implementation of the activities of the proposed action while the long term one through the Massive Open Online Course (MOOC).</p> <p>The proposers could measure in a quantitative way the impact: i.e. the number of people benefited from the action directly, numbers of people benefited from STSM per year, the number of people benefited from the Massive Open Online Course (MOOC) etc.</p> <p>Long-term impact also includes the training of young researchers and the development of the modeling skill of the EU players in both industry and academia.</p>	4

The proposal would benefit from certain improvements:  
The proposers of the Action missed some remarks on developing mathematical/statistical skills (which are in demand). In addition, the simulation-optimization process might be furtherly rationalized on the basis of the nature of the models.

Measures to maximise impact

<b>Q7 - Does the proposal identify the most relevant stakeholders and present a clear plan to involve them as Action's participants?</b>	<b>Mark</b>
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: The identification procedure of the most relevant stakeholders is rigorous, namely: the community of Sensitivity Analysis practitioners, Higher Education Institutions, industrial and other academic partners, policy makers, EU institutions and other international groups. The plan to involve stakeholders as Action's participants is appropriate.</p> <p>The proposal would benefit from certain improvements: There is not a detailed description of the research areas or disciplines.</p>	4

<b>Q8 - Is there a clear and attainable plan for dissemination and/or exploitation of results?</b>	<b>Mark</b>
<p>The proposal addresses this question in an excellent manner.</p> <p>Main strengths: Both dissemination and exploitation plans are clear, concrete and effective. WG4 and Core Group will be engaged with these tasks. Social media, MOOC, handbooks, videos, training schools, and websites will be some of the ways used for the dissemination and exploitation of the results.</p> <p>The realization of a training school to be organized within the first 100 days.</p>	5

Level of risk and level of potential innovation/breakthroughs

<b>Q9 - How well does the proposal succeed in putting forward potential innovation/ breakthroughs with a convincing risk/return trade-off?</b>	<b>Mark</b>
<p>The proposal addresses this question in a good manner.</p> <p>Main strengths: It is very good that theoreticians and practitioners jointly deal with the important issues presented in the proposal.</p> <p>The proposal has some weaknesses and the following improvements are necessary: The potential success of the Action and the achievement of its goals in trade-off risk and return are much higher based on the description of the proposal. In any project proposal though there various types and of various degrees of risks. The proposer of the action fails to address these risks nor address any potential resolutions and activities. Most of the related research might be found in Statistics. The level of innovation is not very high. The description does not prove a significant contribution.</p>	3

## IMPLEMENTATION

Overall Coherence and effectiveness of the work plan

<b>Q10 - Is the work plan (WGs, tasks, activities, timeframe and deliverables) coherent, realistic and appropriate to ensure the achievement of the objectives?</b>	<b>Mark</b>
<p>The proposal addresses this question in an excellent manner.</p> <p>Main strengths: The proposers of the Action describe in detail all WG tasks, activities, timeframe and deliverables in a coherent, realistic and appropriate way to ensure the achievement of the objectives. The work plan is appropriate to ensure the achievement of the proposed objectives.</p>	5

<b>Q11 - Does the proposal identify the main risks related to the work plan and have a plan for contingencies?</b>	<b>Mark</b>
<p>The proposal addresses this question in a fair manner.</p> <p>Positive aspects: The "first source of risk" is well identified.</p> <p>The proposal has significant weaknesses: This section is not treated very clearly in the proposal. This is a rather brief description of potential risks. The proposal fails to give potential solutions. It does not really address or identifies main risks related to the work plan nor less important but still influential to the successful implementation of the work plan. For example, the proposers do not address risks such as failure of participants to contribute in the WGs, withdrawn of members, bureaucratic problems, conflicts on the decision making etc.</p>	2

Appropriateness of management structures and procedures

<b>Q12 - Are the management structure and procedures appropriate?</b>	<b>Mark</b>
<p>The proposal addresses this question in a very good manner.</p> <p>Main strengths: The proposed management structures and procedures are appropriate. They are very specific to a Cost Action. The proposal will follow the basic rules and procedures as they are described in the COST Program with four (4) WGs, a Core Group and a bottom-up approach. Sub-coordination will also be contacted within each WG.</p> <p>The proposal would benefit from certain improvements: More details though the description are required as this is a networking program and coordination and management are crucial for the successful implementation. For example, the proposers should describe how the decisions will actually be taken, what will be the conflict resolution approach, practical issues such as minutes-where to be uploaded, how soon, who, etc., organizational issues, social media coordinator etc.</p>	4

Network as a whole

<b>Q13 - Does the proposed Network envisage the critical mass, expertise and geographical distribution for addressing the challenge and the objectives? If not, does the proposal identify the gaps in the Network and present a clear plan for overcoming the gaps? Are mutual benefits clearly ascertained in case of involvement of NNC and IPC institutions?</b>	<b>Mark</b>
<p>The proposal addresses this question in an excellent manner.</p> <p>Main strengths:            The proposed Network envisage the critical mass, expertise and geographical distribution for addressing the objectives. In the proposal there are totally 16 different countries out of which 8 are non-Inclusiveness Target Countries, 4 are Inclusiveness Target Countries and 4 are characterized as "other" i.e. as "cost international partners" or "near neighbor country institutions" or "international organizations". Geographically there are countries from north, south, west, east and Central Europe. According to the description, the network is quite strong and includes proposers from various academics areas, countries, disciplines, genders and various levels of expertise.</p>	<p>5</p>