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Article

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Project coordination success factors in European Union-funded research, development and innovation projects under the Horizon 2020 and Horizon Europe programmes

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Abstract

Success factors for managing European Union-funded research, development and innovation projects is rather uncharted territory and scarce publications exist, even though considering that the H2020 funding was nearly €80 billion, and Horizon Europe is €95,5 billion. Managing these types of projects has been referred to as ‘managing the unmanageable’, which indicates importance of our study. The aim of this study was to gather input via survey from both project coordinators and partners by assessing factors in five categories of good practices, skills, characteristics and tools of project management, and coordination for successful project implementation. A total of 118 persons replied to the survey who have experience from Horizon 2020 or Horizon Europe funded project(s). Over 80 factors were assessed and rated by the participants. Via standard statistical analysis, a top three lists were created for the different categories from both project partners and coordinators perspectives. A combination of 15 top success factors was formed. Furthermore, to emphasise the practicality of the results, an overarching framework was formed where we propose three prioritised key success factors that research, development, and innovation project management of should focus on. The three key success factors are communication, trust, and collaboration. Communication and trust are further traced down to the coordinator and consortium levels. Active communication and good listening skills are key. Mutual trust is built through high motivation, competence, and active approach to dedicated project activities and roles. Efficient collaboration is reached by nourishing inclusivity and culture, creating a productive environment, and good administrative practices.

Keywords: RDI management, Innovation management, Project management, Success factors, RDI, EU projects

Introduction

Understanding project management success factors and harnessing their potential can lead to higher project performance and hence project success. (Alias et al., 2014) Especially for research, development, and innovation (RDI) projects, understanding how to support RDI professionals to succeed—many times in a cross-cultural environment—is crucial. As Jain et al. (2010) stated, managing research, development and innovation can be ‘managing the unmanageable’. The aim of this study was to produce a manageable amount of prioritised key success factors to consider when coordinating EU-funded RDI projects, which could also give practical tools and support for managers of these projects.

Managing RDI projects, which typically aim for high productivity and excellence, can present unique problems and unusual challenges. The uniqueness of the problems and challenges are further amplified as the work itself involves substantial uncertainty. The outcomes and technological success of the RDI work cannot be predicted perfectly nor the required inputs. Jain et al. (2010) Kauffman and Kock (2022), highlight that impact of project management effort is higher for more complex projects. (Kaufmann & Kock, 2022) RDI projects typically generate multiple collaborative outputs by a group of heterogeneous and autonomous partners (Klessova et al., 2022), and especially EU projects are implemented under stringent agreements and provisions.

The European Union (EU) boosts research and innovation at European level and in EU member states for example by using various funding instruments. This study was targeted at participants in collaborative RDI projects that receive funding from 8th Framework programme Horizon 2020 (H2020, 2014–2020) or 9th Framework Programme Horizon Europe (HE, 2021–2027). A broad survey was carried out to identifying success factors regarding good practices, tools, and leadership and collaboration. As an outcome, an overview of EU-funded RDI project coordination and management success factors were generated.

Collaborative RDI projects funded by the EU are multicultural and multinational by nature. As there is a need for wide range of expertise from different and various European countries and numerous requirements related to excellence and impact of the project, they are also multidisciplinary and operate in a multistakeholder environment. These types of RDI projects are complex by default as they aim to co-develop novel technologies and solutions, which is characterised by high uncertainties. The layer of cross-cultural working environment sets additional challenges for project coordinators and leaders in this already ambitious and multidimensional setup.

The success factors for coordinating and managing EU-funded RDI projects is rather uncharted territory and scarce publications exist, even though considering that the H2020 (programme for 2014–2020) EU funding was nearly €80 billion, and Horizon Europe (programme for 2021–2027) is €95,5 billion. The primary focus of these RDI projects is of course in technology development, research, and innovation, which most likely has led to fact that the importance of coordination and management as well as success factors are rather undocumented. It is quite common that even bigger RDI projects are managed and coordinated by experienced researchers and scientists that are leading substance experts in their field rather than being experts and trained project management specialists. As active coordinators of EU projects, the authors have realised a gap

between different innovation management theories and practical implementation. These phenomena intrigued the authors to investigate further what are the fundamental innovation leadership and leading factors behind successful RDI projects and how the outcomes could support EU project coordination in practice.

The guidance provided by the European Commission focuses on the practicalities of the Grant Management like keeping records, amendments, reporting, payments, communication and dissemination, exploitation, check, audits, and reviews, and so on. (European Commission, 2022a; b). Further guidance can be found from the Annotated Model Grant Agreement by the European Commission, but yet again, it mostly focuses on guiding practical matters as in detail defining different possible roles and linked responsibilities more, eligibility of costs and different cost categories, open science, visibility, IPR management and so on (European Commission, 2021). There are several consultancy companies providing services on successful management of EU-funded projects by offering different tools and practical assistance and guidance.

For the H2020 framework programme, the EC commissioned a study to explore research management structures, roles, tasks, responsibilities, activities, and styles in relation to research management performance and success in the previous FP6 (2002–2006) and FP7 (2007–2013) research funding programmes of the EC. This study resulted in recommendations to the EC for implementation of the H2020 programme. Based on their research, good research management and project success go hand-in-hand. Jansen et al. (2014b) Their tips for excellent research management, which can be affected by coordination and management, include: dedication of sufficient time to management of the project, to focus first on people instead of formal tools or structures, establishing a high level trust among the partners as trust is key that can be affected by high-frequency communication, and to be mindful of cultural differences and work to find how the different cultures can complement each other to advance the project rather than become a barrier (Jansen et al., 2014a).

Similar type of an analysis of the H2020 programme and guidance documents on successful project management for Horizon Europe has not been published to the best knowledge of the authors. Hence, a cautious conclusion can be drawn that no recent studies nor publications have been done in the scope of this study. Furthermore, Abbasi et al (2022) emphasise that many innovation management frameworks have been formulated and discussed in the literature, but in many cases lack industry and culture specific focus (Abbasi et al., 2022). Oeij et al (2017) further describe the need for additional research as there are several ideas on how to motivate innovation in the literature, but little research is conducted by asking the innovators what factors motivate them to reach their goals (Oeij et al., 2017).

The overall objective of our work was to identify good practices and challenges in management and coordination of research, development and innovation projects funded by the European Union and Horizon 2020 and/or Horizon Europe funding programmes. The aim was to gather input and feedback via survey from both coordinators and beneficiaries/partners to assess the good practices, skills, characteristics and tools of project management and coordination for successful project implementation. The input and feedback contribute to forming an overview of RDI project coordination and management success factors for managing HE and H2020 funded projects.

Literature review

As EU project coordination and management specific publications and literature is scarce, the authors extended the literature review towards managing and implementing projects in diverse environments as well as innovation management. The following chapters present the structure and practices of EU-funded RDI projects, discuss the characteristics of project implementation in a cross-cultural environment as well as elaborate on landscape of innovation management and how that could translate to success factors.

The structure and practices of an EU-funded RDI project

The Framework Programmes are tools that foster European RDI actors to join their competences and technical infrastructures to tackle global challenges like green and digital transition and climate change. The programmes aim to generate and diffuse knowledge and technologies, and furthermore, facilitate collaboration and strengthen the impact that RDI can create by developing, supporting, and implementing EU policies. (European Commission, 2023).

H2020 and HE project proposals go through an intensive review phase and only legal entities forming a consortium are eligible to participate in actions provided that the consortium includes, as beneficiaries, at least three legal entities independent from each other and each established in a different country (E European Commission, 2022a, b). The legal entities may be large industrial operators, small and medium enterprises (SMEs), research and technology organisations (RTOs), universities, cities, or non-governmental organisations (NGO) for example.

RDI projects with multiple partners have high relational complexity and uncertainty. It is however highlighted that simultaneous involvement of research organisations and universities, businesses (also competitors), suppliers and customers can significantly increase the collective value-creation potential. (Smiljic et al., 2022) In the EU-funded projects, it is common to have the whole value chain represented either directly as partners or through external target groups or stakeholders. It is characteristic to RDI projects to have broad set of participants with ranging competences. Although the H2020 and HE programmes fund research and innovation, the projects are in many cases expected to include for example social sciences and humanities, international collaboration outside the EU, and in closer to market projects preliminary business plans, techno-economic assessments, and life-cycle assessments. This broadens the scope of the project further, and inclusion of many disciplines may bring unexpected challenges in understanding all project related terminology, research culture and even expected impact and results.

In H2020 and HE funded projects, the project beneficiaries together form a consortium. The consortium should be formed by organisations that contribute to reach the set objectives and problems that need to be solved. The consortium is led by a coordinator, who will manage and coordinate the project, but also represent the consortium to the granting authority which is the European Commission. The coordinator's role is commonly defined to lead the whole project as well as lead the Work Package (WP) leaders. (European Commission, 2022a; b) The work plan is typically described in Work Packages, which are further divided into tasks and subtasks. The management procedures of collaborative EU-funded projects use a widely accepted structure:

- Coordination and management: substance and ‘practical’ project lead, done by the coordinator.
- Management structures:
 - Highest decision-making body: typically consisting of all project beneficiaries (partners), typically led by the coordinator.
 - Substance leading body: typically consisting of all WP leaders, different additional managerial positions, and is led by the coordinator.

Project implementation in culturally diverse environment

As explained in the previous chapter, EU projects are by default multinational and multicultural. According to Krastina et al. (2021), international project managers need to work across cultures, apply agile project methodologies whilst being able to lead the project through its lifecycles with strong leadership, teamwork skills, and creating inclusive environments (Krastina, 2021). Based on the study by Khan et al. (2022), it can be also concluded RDI work has high acceptance of interdependencies in work methods that supports common and independent goals, but may result in dysfunctional ways of working. Collaborative networks that co-innovate perceive high level of goal interdependency (Iqra et al., 2022). Gaining advantage from efficient use of resources through experience sharing and collaboration require excellent planning skills which are core competencies of project managers and leaders. Managerial planning tasks become even more challenging in a diverse environment where professionals from different backgrounds, cultural orientation and disciplines collaborate.

The scope of cross-cultural management is wide and complex (see, for example, Smith et al. 2008), covering the majority of socially determined human activities and relationships. In multinational organisations, subsidiaries tend to function more in accordance with the value systems and beliefs of the host culture than the home culture, even if the home office’s procedures are formally adopted. Thus, managers have to consider the values prevailing in the local context within countries just as between countries. (Kaasa et al., 2014) According to Kaasa and Vadi (2010), for example relating to successful remuneration systems, in more individualistic cultures individual reward systems are preferred, where incentives and bonuses are linked to individual performance. On the other hand, in more collectivist cultures, teamwork is emphasised, and incentives and bonuses are better linked to the whole group.

Furthermore, Kaasa and Vadi (2010) emphasise that in cultures with high uncertainty avoidance there is a tendency for an emotional need for rules and formal processes, whereas in cultures with low uncertainty avoidance only necessary rules seem to be culturally accepted. Scepticism towards the new and unknown can be linked to resistance of innovations, whereas in cultures with low uncertainty avoidance, creativity is fostered, and innovations embraced. As a conclusion, cultures with lower uncertainty avoidance are expected to be more successful in innovation, where as cultures with higher uncertainty avoidance are expected to be better in implementation (Kaasa and Vadi 2010).

Chevrier (2003) identified three kinds of cross-cultural practices implemented by project managers in transnational environment: show tolerance by doing nothing and not

talk about the differences, build personal relationships between team members to enable mutual agreements, and rely on professional or occupational cultures to overcome cultural barriers (Chevrier, 2003). Chevrier's (2003) views on the three cross-cultural practices seem rather practical solutions to everyday situations, but they do not consider cultural sensitivity and inclusiveness. Kilduff and Cormican (2022) argued that empathy and communication, emotional and cultural intelligence, personality, and openness to learning are key to cultural intelligence in complex multicultural environments. Furthermore, cultural intelligence is vital in leading global projects (Kilduff & Cormican, 2022).

As a summary, it can be concluded that cross-cultural management puts into spotlight the interaction between people with different background and culture together with ways and means of interaction and communication. There seems to be plenty of frameworks on publications in the scope and therefore there is a lot of content on the topic, however, the cultural aspects and softer management aspects are not really linked in literature to RDI projects and EU project management.

Innovation management and success factors

Success factors can be seen as "important influences that contribute to project success". They can also be viewed to be typically linked to ensuring expected project performance, which connects to successful project implementation. The high complexity of RDI projects as well fast-changing technology-driven environments projects are implemented in, makes it challenging to categorise and reduce success factors to a manageable amount. Bergmann and Karwowski (2018). Amade et al. (2015) see that critical success factors are a selection prioritised key variables or factors that managers should focus on. Critical success factors are also described as inputs to project management practices, which directly or indirectly lead to project success. (Amade, et al., 2015; Alias et al., 2014; Frefer et al., 2018) There is a lot of debate on how success factors should be determined, but from project management perspective, critical success factors are variables or conditions that can be managed/affected and have a significant impact on the success of the project Frefer et al. (2018). Oeij et al (2017) emphasise the leadership in innovation projects as the process of innovation projects depend heavily on the skills of project managers and quality of their leadership, but further highlights, that in many cases it is unclear what leadership styles fits best certain circumstances (Oeij et al., 2017).

In a systemic review by Schopp et al. (2019), good team spirit and functioning team are highlighted as important factors affecting project success, a strong correlation has been demonstrated between motivation and project management success. Also, a strong relation with project success is demonstrated with good internal and external project communication (Schopp et al., 2019). Especially so-called soft factors typically link to human resources like coordination, support, managing team resources, ensuring motivation and communication (Bergmann & Karwowski, 2018). Focus on these soft factors is interesting especially in the frame of the RDI projects as people are the brainpower and innovators, not machines, processes, or systems themselves alone. Soleas (2020) describe leader strategies for motivating innovation in individuals that include elements such as careful managerial planning, encouraging experimentation, managerial styles, fostering collaboration and providing support. Based on their findings, the strategies tend to be discipline-specific and tend to be formulated

via investigating the business perspectives rather than specifically the motivations of the actual innovators. Soleas emphasises leaders to focus on engaging curiosity, interest, and satisfaction (Soleas, 2020).

Management and leadership challenges in EU-funded RDI projects are compared to conventional projects rather unique and unusual. The uniqueness of the problems and challenges are further catalysed as the work itself involves substantial uncertainty and risks, and by the fact that the RDI projects typically aim for developing something novel, high productivity and excellence. The outcomes and technological success of the RDI work cannot be predicted perfectly nor the required inputs. (Jain et al., 2010) This is further amplified by participants with different backgrounds, expressing cultural diversity, collaborative approach, organisational interdependencies, different approaches and targets combined with high level innovation and somewhat bureaucratic procedures established by the funding organisation create numerous challenges for managing and coordinating projects, and leading the researchers and industry representatives towards common goal that is the defined project results.

Methods

To find answers to the research questions, it was chosen for this study to utilise quantitative research methods. The survey questions and factors to be numerically evaluated were part of the researchers chosen method to rate by scales and therefore, standardise and compare varying perspectives and experiences of the survey participants.

Survey design

After a thorough literature review into the topic of success factors and managing HE and H2020 funded projects, a survey was generated. The survey was divided into three sections: (1) background, (2) success factors—project implementation, and (3) success factors—leadership and collaboration.

In total, there were 16 questions, and the survey was in English. For the background, details on the organisation type, and experience in H2020 and/or HE projects were asked. For Sects. 2 and 3, most questions were Likert-type, where opinions and attitudes towards the topics can be rated. The participants were typically asked to rate the importance from 1 to 5, 1 being 'not important' and 5 being 'very important'.

In Sect. 2, the questions related to good practices for successful project implementation, and project tools and practices and their importance for successful project implementation and outcomes are presented. In Sect. 3, the questions related to ranking aspects and characteristics affecting building and maintaining good collaboration with the consortium, skills of the project coordinator, characteristics of the project coordinator, characteristics of the project environment that coordination should thrive for to ensure effective innovation management and creation of wider impact, and finally, the key issues that can affect the project implementation are presented. Overall, the five categories assessed and rated were: good practices, coordinator skills, coordinator characteristics, good practices and tools of project management and coordination for successful project implementation.

Data collection

Data were collected for this study via an online survey, which was made via Microsoft Forms in Microsoft Teams. The survey was directed for individuals with experience in coordinating and/or working in EU-funded projects from the H2020 and HE frameworks. The experience was ensured by the first question asking whether they had experience in one or the other, both or none. Due to the nature of the study, all data collected were primary data directly from the targeted stakeholders. All participants were required to answer each question.

The survey was open for replies for two months between 1.12.2022–30.1.2023. The survey was distributed via email to the authors' known EU project and RDI networks, coordinators of H2020 and HE funded projects as well as consortiums to reply across EU.

Data analysis

The raw data from Microsoft Forms were exported in an.xls file format, and then analysed and illustrated in Excel. Survey questions that had nominal scales, like the type of organisation the respondent represented, produced categorical (nominal) data. The survey Likert-type questions, which were rated between 1 to 5, produce ordinal data and were quantitatively analysed. Numerical data were produced by the question types that investigated, e.g. the amount of project experience gained by the respondents.

Typical statistical analysis of mean, mode, standard deviation, and sample size determination (coordinators, vs. partners) was utilised to analyse the data. Mean has been selected as the approach for average and hence standard deviation used as the measure of variability within the distribution. Standard deviation describes on average how much is the distribution of each of the values from the mean. As an output, tables with arranged data on specific value like mean, bar diagrams as well as radar diagrams were used to illustrate the data.

In total, 82 factors were assessed and rated by the participants from five different categories. Via the standard statistical analysis, a top three lists were created for the different categories from both project partners and coordinators perspectives. A combination of 15 top success factors was formed. Further analysis was made to create a prioritised list of three key success factors for RDI project managers to focus at.

Ethical compliance

Participation to the survey was voluntary and could be stopped at any time (opt-out). No personal data were collected in respect to the General Data Protection Regulation EU 2016/679 (GDPR) and the surveys were anonymous. By replying to the survey, the participants accepted that the results were to be used for research purposes and are aware that all results would be anonymised, and no direct correlations or assumptions can be made between the replies and repliers. The participants were also given notice that the results will be published in a publication focusing on success factors for EU-funded RDI project coordination and management. The participants could leave their professional e-mail addresses if wished for the authors to send the publication to them.

The survey included a privacy notice for VTT research activities, which is in accordance with the EU GDPR. The privacy notice explained the name and purpose of processing, controller, data protection office and contact person, the data subject and personal data categories, the purpose of processing and legal basis, personal data sources, recipient, or categories of recipients, transfer of personal data outside the EU or European Economic Area (EEA), retention period of personal data as well as the principles of personal data protection and rights of the data subject.

Reliability and validity

Reliability describes the consistency and accuracy of results over time and larger take of e.g. population. Validity on the other hand describes if the research measured what it was intended to measure or how credible the research results are (Golafshani, 2003).

For this study, validity was ensured by basing the survey questions on literature and authors' experience, and iterating the survey based on received feedback. To ensure easy and robust replying as well as minimise possible confusion and fatigue, the survey was circulated among expert colleagues for feedback. Based on the feedback given, the survey was shortened and made clearer for a pilot testing of the survey. After that, the survey was deemed functioning and launched.

The sample size for this study was aimed at least for 100 replies to get representative results. Also, it was critical to have different levels of expertise and experience from EU projects as well as different types of organisations from different EU countries to have a representative take on the Pan-European EU funding instrument.

Results and discussion

Background of survey participants

A total of 118 persons replied to the survey. All participants replied to have participated previously or are currently participating in an H2020 or HE funded project. Both funding programmes, H2020 (2014–2020) and Horizon Europe (HE, 2021–2027), were equally represented in the experiences of the survey participants.

Figure 1 depicts the organisation type of the survey participants. Majority of the participants were from research and technology organisations (36.4%) and business organisations (31.4%). University or other academia (14.4%) and public body type of

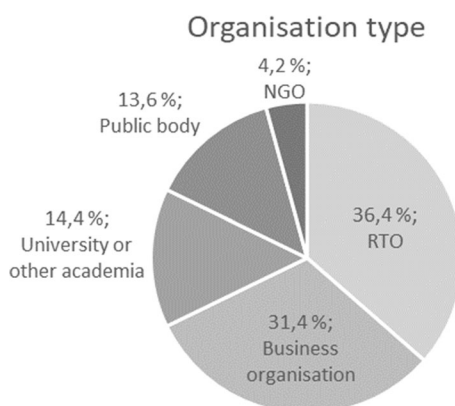


Fig. 1 Background information: organisation type of survey participants

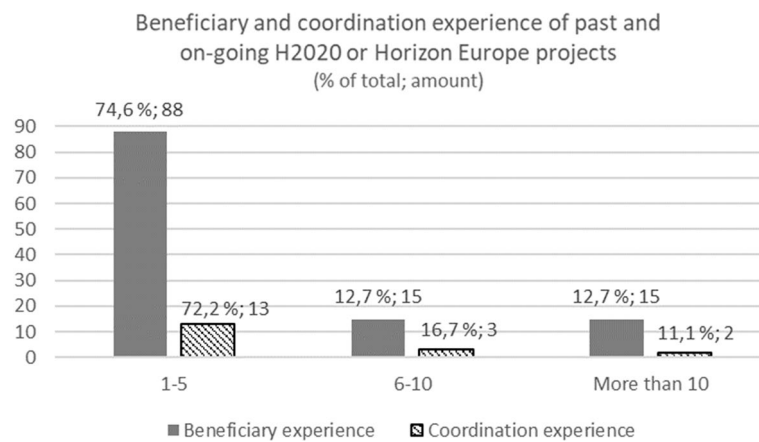


Fig. 2 Background information: survey participants' beneficiary (partner) and coordination experience from H2020 and Horizon Europe projects

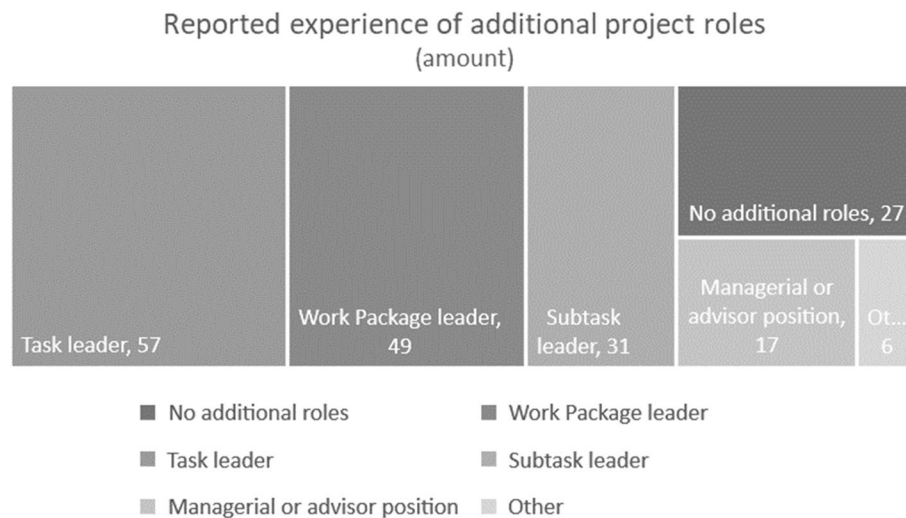


Fig. 3 Background information: survey participants' additional project role experience

organisations (13.6%) were both represented approximately the same. Some non-governmental organisations NGOs (4.2%) also replied.

Figure 2 presents the H2020 and Horizon Europe project experience of the survey participants. Majority, approximately 75%, of the survey participants had experience from 1–5 projects. Especially business organisations had more answers in the 1–5 project range. Both '6–10' and 'More than 10' were replied by approximately by 13% of the survey participants. All of the organisation types were represented among those who replied to have more experience, '6–10' or 'More than 10'. Regarding coordination and management experience, 15% of the survey participants had experience being a coordinator of a H2020 or Horizon Europe project. Approximately 72% had experience in coordinating 1–5 projects.

Survey participants reported also additional project roles (Fig. 3). In total, 57 had experience as a Task leader which was the main role reported. WP leader experience

was reported by 49. Of the total survey participants, 23% reported of no additional project role activities.

Good practices and tools for successful project implementation

Survey participants evaluated good practices for project implementation ranking the following factors from 1 (not important) to 5 (very important) (Table 1). The top three factors were evaluated to be (1) clear responsibilities of the different roles (4.58); (2) clearness of the project plan (4.53); and (3) high engagement and activity during project implementation (4.51).

The coordinators' responses resulted in the same top 3, but in a different order. Coordinators weighed most important *high engagement and activity during project implementation* (0.41 higher). Otherwise, the evaluation of importance what very close to the replies by all survey participants.

The survey participants evaluated the importance of project tools and practices from the perspective successful project implementation and outcome (Table 2). The top three factors were (1) clear documentation of contact information and roles (4.22); (2) early scheduling of meetings, input requests and deadlines (4.20); and (3) managing project plan and your responsibilities in your own organisation (4.18).

Table 1 Evaluation of good practices for successful project implementation (1 = not important, 5 = very important), organised by mean (all) weighed by score 5

Factor (top 3, ^x =coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Clear responsibilities of the different roles ²		0	2	1	41	74	4,58	4,77	5	0,60
2. Clearness of the project plan ³		0	1	6	40	71	4,53	4,54	5	0,64
3. High engagement and activity during project implementation ¹		0	1	9	37	71	4,51	4,92	5	0,68
Clear division of roles		0	1	4	47	66	4,51	4,46	5	0,61
Clear and strong lead by the Coordinator		0	2	8	39	69	4,48	4,46	5	0,70
Clear understanding of deliverables and milestones		1	2	7	46	62	4,41	4,38	5	0,75
Responsive and dedicated main contacts		0	1	7	54	56	4,40	4,46	5	0,64
Clarity of project objectives and KPIs		0	6	15	44	53	4,22	4,15	5	0,86
Clearness of the management structures and processes		0	4	17	54	43	4,15	4,54	4	0,79
Integration and alignment of your needs and interests in the project plan		0	1	18	68	31	4,09	4,23	4	0,67
Sufficient time in the beginning to organise and plan the work		0	2	27	49	40	4,08	3,92	4	0,80
High engagement and activity in the proposal planning and writing		0	5	28	39	46	4,07	4,15	5	0,89
High-level monitoring and follow-up of project progress		0	7	29	48	34	3,92	4,08	4	0,88
High engagement and activity during Grant Agreement Preparation (GAP)		2	10	43	41	22	3,60	3,38	3	0,94

The superscript values 1-3 refer the coordinators' perspectives

Table 2 Evaluated importance of project tools and practices from the perspective successful project implementation and outcome (1 = not important, 5 = very important), organised by mean (all)

Factor (top 3, ^x =coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Clear documentation of contact information and roles ²		0	4	18	44	52	4,22	4,50	5	0,83
2. Early scheduling of meetings, input requests and deadlines ¹		0	0	19	56	43	4,20	4,75	4	0,70
3. Managing project plan and your responsibilities in your own organisation ³		2	2	10	63	41	4,18	4,42	4	0,79
Once a year face-to-face consortium meeting (other one online)		1	8	19	39	51	4,11	4,17	5	0,97
Functioning digital workspace environment		0	7	18	54	39	4,06	4,08	4	0,85
Setting-up your own project management structures and processes in your organisation		3	5	14	57	39	4,05	4,33	4	0,92
Clear and timely documentation practices		0	4	26	56	32	3,98	4,17	4	0,80
Feedback loop		0	4	32	55	27	3,89	4,33	4	0,79
Quick set-up of tools like workspaces and communication channels		0	7	27	57	27	3,88	4,00	4	0,83
Interactive sessions like workshops		0	6	34	53	25	3,82	4,08	4	0,82
Monthly WP meetings		0	10	39	34	35	3,80	4,25	3	0,97
Monthly WP leaders meetings		1	5	43	43	26	3,75	3,67	4	0,88
Planning tools for task lists and to dos with timelines/deadlines		4	12	28	43	31	3,72	3,92	4	1,07
Training sessions on compliance of EU, GA and CA provisions and regulations		2	11	42	40	23	3,60	3,92	3	0,96
Twice a year face-to-face consortium meetings		8	16	35	23	36	3,53	3,58	5	1,25
Chat or instant message with the consortium		11	22	42	35	8	3,06	3,25	3	1,06

The superscript values 1-3 refer the coordinators' perspectives

The coordinators' responses resulted in the same top three, but in a different order. Coordinators weighed most important the 'early scheduling of meetings, input requests and deadlines'. In one case, 'monthly Work Package leader meetings', was the coordinators' mean lower than all of the survey participants. However, otherwise the coordinators' mean was higher or significantly higher than the responses given by all survey participants. Especially, the 'early scheduling of meetings, input requests and deadlines' was 0.55 higher, 'monthly Work Package meetings' (0.45 higher), 'feedback loop' (0.44 higher), and 'training sessions on compliance of EU, GA (Grant Agreement, formed with the consortium and EC) and CA (Consortium Agreement) provisions and regulations' (0.32) were evaluated significantly higher in importance by the coordinators.

Leadership and collaboration success factors

The survey participants evaluated the importance of presented factors affecting building and maintaining good collaboration within the consortium (Table 3). The top three factors were for both coordinators and all survey participants (1) motivation of project coordinator (4.54); (2) motivation of the project consortium (4.54); and (3) management

Table 3 Evaluated importance of factors affecting building and maintaining good collaboration within the consortium (1 = not important, 5 = very important), organised by mean (all), weighed by score 5

Factor (top 3, ^x =coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Motivation of project coordinator ¹		1	0	6	38	73	4,54	4,67	5,00	0,67
2. Motivation of project consortium ²		1	0	5	40	72	4,54	4,67	5,00	0,66
3. Management competence of project coordinator ³		1	0	8	39	70	4,50	4,56	5,00	0,70
Competence of project consortium		0	2	9	44	63	4,42	4,39	5,00	0,71
Availability and flexibility of project coordinator		1	2	12	59	44	4,21	4,44	4,00	0,76
Frequent communication with the consortium		0	2	22	46	48	4,19	4,50	5,00	0,79
Systematic leading approach to project execution		1	2	21	54	40	4,10	4,22	4,00	0,81
Technical or substance competence of project coordinator		1	4	32	48	33	3,92	3,89	4,00	0,87

The superscript values 1-3 refer the coordinators' perspectives

Table 4 Evaluated importance of project coordinator skills (1 = not important, 5 = very important), organised by mean

Factor (top 3, ^x =coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Teamwork and leading ³		1	0	4	34	79	4,61	4,67	5	0,64
2. Communication and listening skills ¹		1	0	7	30	80	4,59	4,83	5	0,68
3. Decision-making ²		1	0	8	30	79	4,58	4,78	5	0,70
Problem solving		1	1	14	40	62	4,36	4,56	5	0,79
Conflict resolution		1	2	15	37	63	4,35	4,50	5	0,83
Time and resource management		1	0	19	41	57	4,30	4,44	5	0,80
Quality leading		1	2	14	45	56	4,30	4,28	5	0,81
Social skills		1	3	20	41	53	4,20	4,28	5	0,87
Negotiation		1	2	19	48	48	4,19	4,22	5	0,83
Deep understanding of the EC, GA and CA provisions and regulations (incl. financial management skills)		0	4	16	55	43	4,16	4,17	4	0,78
Delegation skills		2	2	16	58	40	4,12	4,11	4	0,83
Presentation and public speaking		1	3	20	53	41	4,10	4,11	4	0,83
Risk management		1	1	28	51	37	4,03	4,00	4	0,82
IT skills		2	17	44	43	12	3,39	3,22	3	0,92

The superscript values 1-3 refer the coordinators' perspectives

competence of the project coordinator (4.50). The top two had the same mean, and only one-reply difference in the responses to score 5; therefore, it can be considered that both factors, the motivation of the project coordinator and the consortium, is of equal importance.

Table 4 presents the ranking in importance the skills of the project coordinator. The top three factors were (1) teamwork and leading (4.61); (2) communication and listening skills (4.59); and (3) decision-making (4.58). The coordinators' responses resulted in the same top three, but in a different order. Coordinators weighed most important

Table 5 Evaluated importance of project coordinator's characteristics (1 = not important, 5 = very important), organised by mean (all)

Factor (top 3, x=coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Trustworthy ¹		1	0	5	29	83	4,64	4,61	5	0,65
2. Positive and open communication ²		1	0	5	35	77	4,58	4,61	5	0,66
3. Solution oriented ³		1	0	6	47	64	4,47	4,61	5	0,68
High motivation and passion		1	2	8	40	67	4,44	4,56	5	0,77
Results oriented		2	1	13	51	51	4,25	4,50	5	0,82
Creating inclusive and diverse culture		3	3	23	41	48	4,08	4,00	5	0,97
Ambition level		1	3	22	55	37	4,05	4,00	4	0,83
Analytical		3	4	35	40	36	3,86	4,00	4	0,98
Visionary		3	5	35	47	28	3,78	3,72	4	0,94

The superscript values 1-3 refer the coordinators' perspectives

Table 6 Evaluated impact of issues that might affect the project implementation (1 = negative impact, 5 = no or little impact), organised by mean (all)

Factor (top 3, x=coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Too little personnel resources ²		43	20	18	12	25	2,63	2,94	1	1,57
2. Too little financial resources		31	33	20	16	18	2,64	3,17	2	1,40
3. Conflicts among consortium members		34	29	21	13	21	2,64	3,22	1	1,45
No clear coordinator or coordination ³		40	28	7	15	28	2,69	3,00	1	1,61
Changes in consortium (partner leaving, bankruptcy, etc) ¹		15	32	40	24	7	2,80	2,78	3	1,09
No clear division of roles and responsibilities		29	32	15	17	25	2,81	3,22	2	1,49
Different views on project plan implementation		14	38	30	22	14	2,86	3,28	2	1,20
Change of the coordinator (organisation)		15	25	47	17	14	2,92	3,00	3	1,16

The superscript values 1-3 refer the coordinators' perspectives

'communication and listening skills'. The coordinators weighed the 'communication and listening skills' as well as 'decision-making' more important than all of the survey participants combined.

In Table 5, coordinator's characteristics and their importance were evaluated. The top three factors were for both coordinators and all survey participants: (1) trustworthy; (2) positive and open communication; and (3) solution oriented. Otherwise, the coordinators and all survey participants evaluated the characteristics similarly, but for the 'results-oriented' characteristic the coordinators ranked it more important.

The survey participants also evaluated challenges and issues that might affect the project implementation (Table 6). They rated the issues from 1 to 5 on impact to the project, 5 being no or little impact. The top three issues: (1) too little personnel resources (2.63); (2) too little financial resources (2.64); and (3) conflicts among consortium members (2.64). The coordinators evaluated 'changes in consortium (partner leaving, bankruptcy,

etc.)' as the most impactful issue, then '*too little personnel resources*' and finally as third, '*no clear coordinator or coordination*'. All the issues received quite similar distribution of scoring among the scale, the standard deviation was the highest for the '*no clear coordinator or coordination*'.

Finally, the survey requested the participants to evaluate the given characteristics of EU-project environment that coordination should aim for to ensure effective innovation management and create wider impact (Table 7). Score 5 being very important, the top three factors evaluated by all were (1) cooperative, supportive and collaborative; (2) motivating and inspiring; 3) productive. The coordinators evaluated into the top three (1) cooperative, supportive and collaborative; (2) productive, and then (3) trust and safety. Overall, the coordinators evaluated most factors higher, but '*positive feedback and reinforcement*' as well as '*compassion, respect and understanding*' were evaluated little bit lower than by all.

Overview of the top success factors

Table 8 presents a comparison of all the top factors evaluated by all the survey participants as well as the coordinators. Overall, the top three factors out of all the top factors rated by all of the survey participants are (1) trustworthy (4.64); (2) teamwork and leading (4.61); and (3) communication and listening skills (4.59). The top three for the coordinators are (1) high engagement and activity during project implementation (4.92); (2) communication and listening skills (4.83); and (3) decision-making (4.78).

Overall, all of the top factors were evaluated higher by the coordinators than all survey participants. The differences with the scores are rather small, ranging for all survey participants from 4.18 to 4.64 and for the coordinators from 4.42 to 4.92.

All the top three factors from each of the different question categories were taken into account for this closer inspection. The factors presented are linked into the related

Table 7 Evaluated characteristics of the EU-project environment that coordination should aim for to ensure effective innovation management and create wider impact (1 = not important, 5 = very important), organised by mean (all)

Factor (top 3, x=coordinators' perspective)	Score	1	2	3	4	5	Mean (all)	Mean (coord.)	Mode (all)	Standard deviation (all)
1. Cooperative, supportive and collaborative ¹		0	0	5	45	68	4,53	4,72	5	0,58
2. Motivating and inspiring		0	1	13	48	56	4,35	4,44	5	0,71
3. Productive ²		0	0	15	48	55	4,34	4,56	5	0,69
Trust and safety ³		1	2	6	58	51	4,32	4,44	4	0,73
Innovative		0	1	18	46	53	4,28	4,33	5	0,75
Effective and punctual		0	3	14	53	48	4,24	4,39	4	0,76
Open and accepting		0	2	15	55	46	4,23	4,28	4	0,73
Positive feedback and reinforcement		0	3	14	61	40	4,17	4,11	4	0,73
Simple and clear		0	1	26	48	43	4,13	4,17	4	0,78
Scientifically focused		0	5	20	51	42	4,10	4,22	4	0,83
Compassion, respect and understanding		0	5	23	53	37	4,03	4,00	4	0,83
Flexible		1	1	28	51	37	4,03	4,06	4	0,82
Fun, friendly and relaxed		0	8	40	52	18	3,68	3,78	4	0,82

The superscript values 1-3 refer the coordinators' perspectives

Table 8 Comparison of the top factors evaluated by all the survey participants and coordinators (1 = not important, 5 = very important), arranged by mean

All survey participants		Coordinators	
Mean	Factor	Factor	Mean
4.64	1. Trustworthy ^A	1. High engagement and activity during project implementation ^C	4.92
4.61	2. Teamwork and leading ^B	2. Communication and listening skills ^B	4.83
4.59	3. Communication and listening skills ^B	3. Decision-making ^B	4.78
4.58	Clear responsibilities of the different roles ^C	Clear responsibilities of the different roles ^C	4.77
4.58	Decision-making ^B	Early scheduling of meetings, input requests and deadlines ^E	4.75
4.58	Positive and open communication ^A	Teamwork and leading ^B	4.67
4.54	Motivation of project coordinator ^D	Motivation of project coordinator ^D	4.67
4.54	Motivation of project consortium ^D	Motivation of project consortium ^D	4.67
4.53	Clearness of the project plan ^C	Trustworthy ^A	4.61
4.51	High engagement and activity during project implementation ^C	Positive and open communication ^A	4.61
4.50	Management competence of project coordinator ^D	Solution oriented ^A	4.61
4.47	Solution oriented ^A	Management competence of project coordinator ^D	4.56
4.22	Clear documentation of contact information and roles ^E	Clearness of the project plan ^C	4.54
4.20	Early scheduling of meetings, input requests and deadlines ^E	Clear documentation of contact information and roles ^E	4.50
4.18	Managing project plan and your responsibilities in your own organisation ^E	Managing project plan and your responsibilities in your own organisation ^E	4.42

Factor categories: A = coordinator characteristics, B = coordinator skills, C = good practices, D = collaboration, E = project tools and ways of working

categories: A = coordinator characteristics, B = coordinator skills, C = good practices, D = collaboration, and E = project tools and ways of working. The results for the success factors are next presented in combining the following: A + B, C + E and D.

Coordinator-related skills and qualities (categories A and B) from the top factors are illustrated in Fig. 4. The factors evaluated highest that link to the coordinators' skills and qualities are communication and listening skills, decision-making, teamwork and leading, motivation of the project coordinator, trustworthy, positive and open communication, solution oriented, as well as management competence of the project coordinator. These top skills and qualities can be grouped into the following categories:

(i) Communication and listening related:

- a. Communication and listening skills.
- b. Positive and open communication.

(ii) Motivation and competence related:

- a. Motivation of the project coordinator.
- b. Management competence of the project coordinator.

(iii) Leadership related:

Coordinator related skills and qualities: top factors evaluated by
all survey participants (inner) and coordinators (outer)

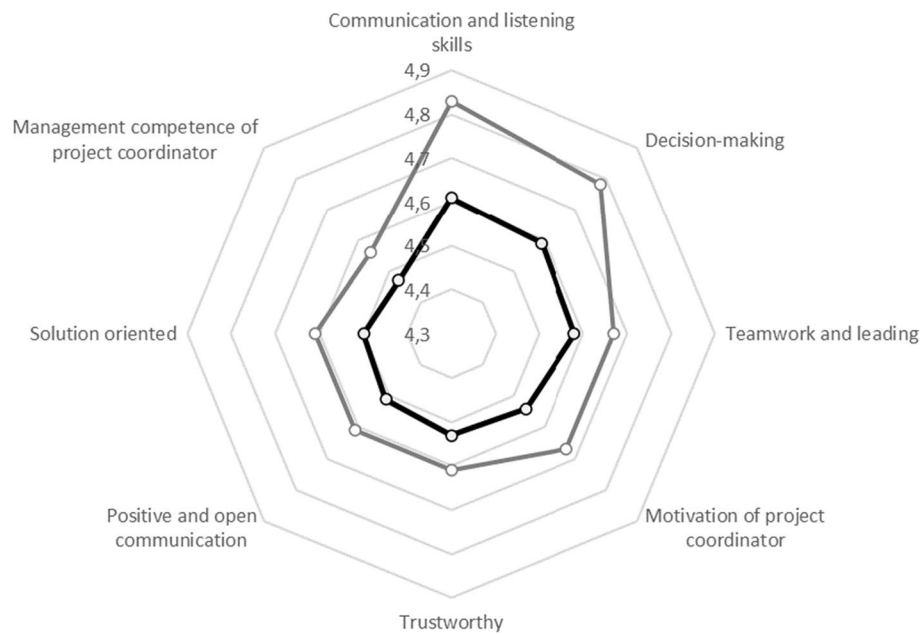


Fig. 4 Coordinator-related skills and qualities related top factors evaluated by all survey participants (inner illustration) and coordinators (outer)

- a. Teamwork and leading.
- b. Decision-making.
- c. Solution orientated.
- d. Trustworthy.

Regarding good practices (C) and good project tools and ways of working (E) (illustrated in Fig. 5), the following categories on the top factors can be concluded:

(i) Effective administrative practices:

- a. Early scheduling of meetings, input requests and deadlines.
- b. Clear documentation of contact information and roles.

(ii) Effective project management practices:

- a. Clear responsibilities of the different roles.
- b. Managing the project plan and own responsibilities within your own organisation.

(iii) Personnel management:

- a. Managing the project plan and own responsibilities within your own organisation.
- b. High engagement and activity during project implementation.

Good practices, project tools and ways of working: top factors
evaluated by all survey participants (inner) and coordinators (outer)

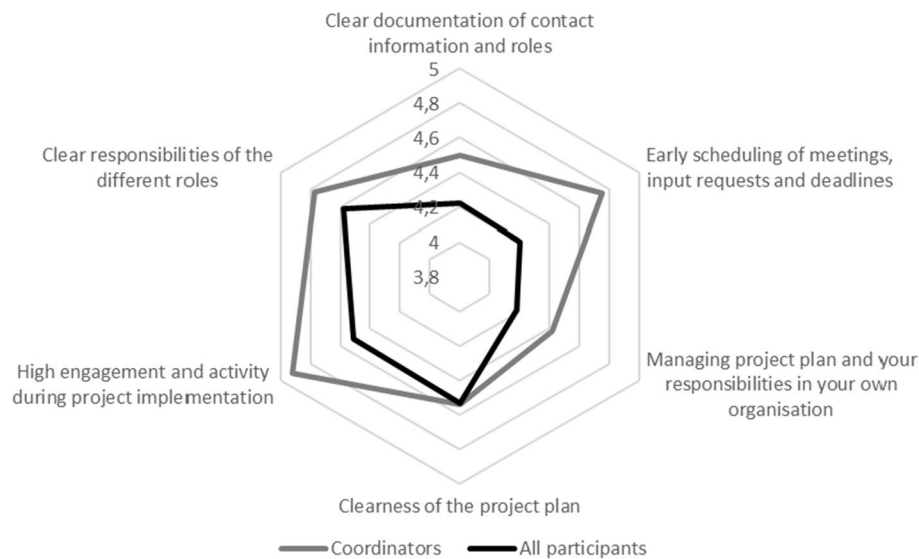


Fig. 5 Top factors of good practices, tools and ways of working evaluated by all survey participants (inner) and coordinators (outer)

The collaboration (D) related factors were pinpointed to motivation of the coordinator, motivation of the project consortium as well as the management competence of the project coordinator. As EU RDI projects are characterised especially as multicultural and multidisciplinary, the collaboration-related factors are expanded to an analysis of the multicultural project management-related success factors. These multicultural project management-related factors are presented in Fig. 6. The factors that were evaluated as most important can be further grouped into four main categories:

- (i) Inclusivity related:
 - a. Creating inclusive and diverse culture.
 - b. Open and accepting.
 - c. Compassion, respect and understanding.
- (ii) Communication related:
 - a. Positive and open communication.
 - b. Communication and listening skills.
- (iii) Leadership related:
 - a. Cooperative, supportive, and collaborative.
 - b. Motivating and inspiring.
 - c. Positive feedback and reinforcement.
 - d. Teamwork and leading.

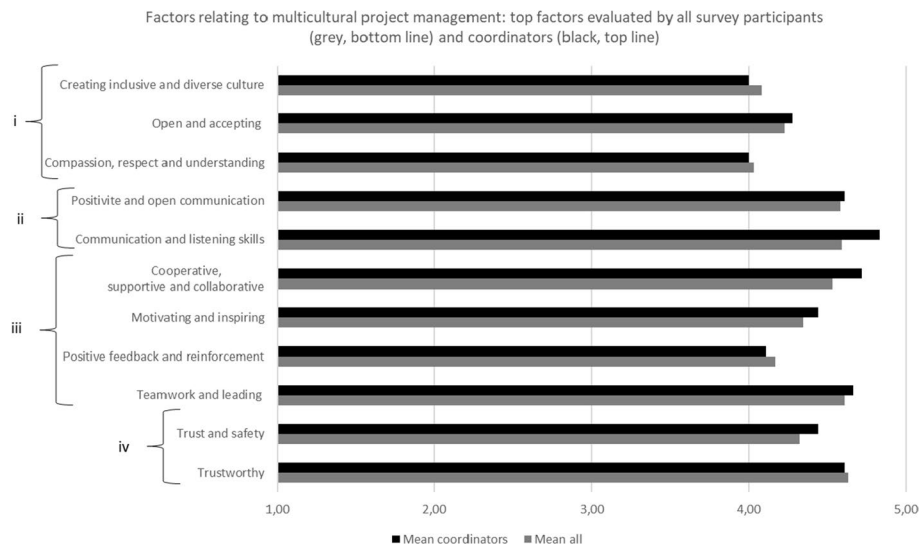


Fig. 6 Factors relating to multicultural project management: top factors evaluated by all survey participants (grey, bottom line) and coordinators (black, top line)

(iv) Trust related:

- a. Trust and safety.
- b. Trustworthy.

Prioritised key success factors

We propose based on the data collected and analysed that EU-funded RDI project coordination and management should focus on establishing: (1) extensive communication, (2) trust and (3) efficient collaboration as depicted in Fig. 7. Communication and trust are both distinguished in two levels: the coordinator and consortium. From innovation management point of view, our survey is aligned with Amade's (2015) findings on critical success factors of public project delivery, although we need to emphasise that we focused on the cultural elements and did not go in depth to the cultural intelligence related matters that may affect project management and leadership.

Successful EU-funded RDI project implementation and management

Overall, coordinators weighed in most cases all the evaluated factors higher in importance than all the survey participants. Leadership type factors were evaluated higher by the coordinators, when all the survey participants evaluated management type factors higher. The survey data indicate that the coordinators' perspective differs from the partners' perspective. It would be however beneficial to understand better if the expectations and requirements of project coordinators indeed differ from the participants' expectations or are these just two sides of a coin.

According to our study, the most important leadership skills of project coordinator in RDI projects, as coordinators themselves state, are engagement, communication, and decision-making. From the other participants point of view, the main action points are being trustworthy, leading, and communicating.

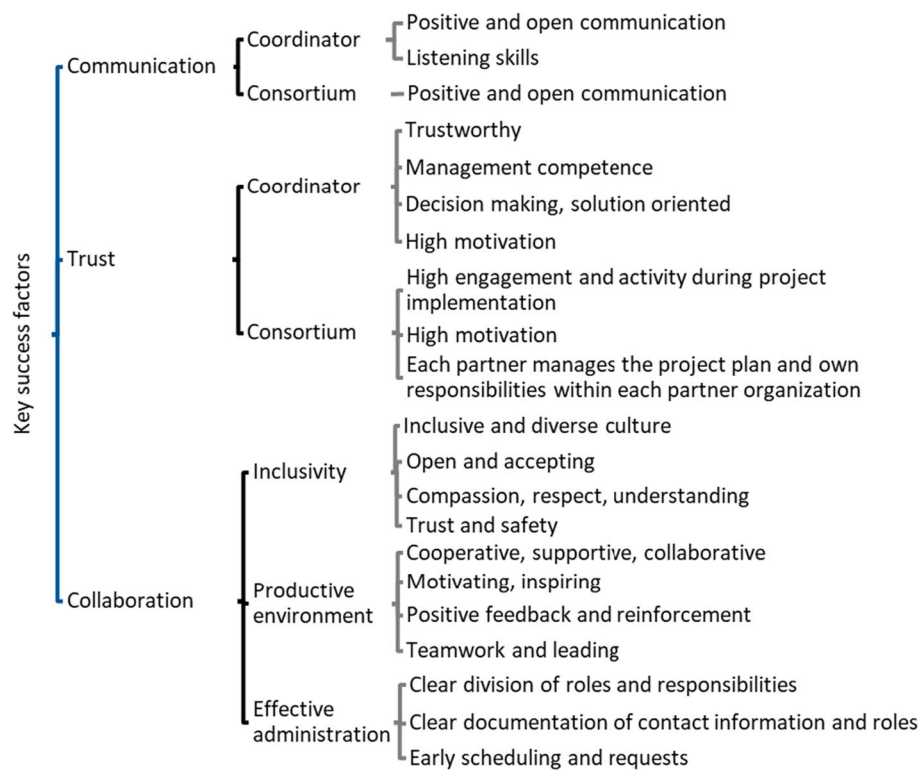


Fig. 7 Prioritised list of key success factors for coordination and management of EU-funded RDI projects

Throughout the survey replies, a conclusion could be drawn that project participants see leadership first through concrete and visible management actions like booking meeting early enough, resolving conflicts and making swift decisions. For coordinators, leadership type of matters are emphasised meaning for example listening skills, creating inclusive and accepting environments, and their own motivation. This could be due to the fact that leadership related matters are important for successful project management; even though, these types of factors might not be so tangible and visible to everybody else. Anyhow, several same values are evaluated high by both project partners and coordinators, for example in teamwork and trust.

It seems that the same basic principles apply to good management in RDI projects. Temporary project organisations need to consider similar aspects of work life and human interaction as companies do in their operations. However, higher success in RDI projects can be reached by creating good trust, and a trustworthy and inclusive project environment, which coupled with high motivation is a fertile basis to co-develop novel solutions and reach set ambitious targets together. Our findings support the approach suggested Jansen et al. in highlighting the importance of leading people. Leadership skills combined with sufficient time allocation to project management tasks, would lead to better project implementation.

Geert Hofstede's work on cultural differences and their consequences on work life has inspired scholars and practitioners for decades. The extensive research in the field has proved that cultural differences exist and that they have effect on how people interact in work related situations. The cultural dimension plays a role in all human interactions,

and in management and leadership work they must be considered. RDI projects are one example of current structures, where work is done in temporary networks formed by different operators. In these types of constantly changing structures, communication and inclusiveness are becoming more important than ever.

We found similarities between this research and the ideas presented by Kilduff & Cormican regarding cultural intelligence and its' importance in international cooperation. Furthermore, Chevrier's findings on using occupational cultures to overcome cultural barriers may be present in RDI projects although our survey does not directly show its' existence. In our view, cultural awareness contributes to effectiveness and efficiency on working methods. Even more important is the effect on people. Cultural intelligence is needed both in management and leadership type of work. In the literature review, the term cross-cultural management surfaced a lot. We see this as a narrow term in the scope of innovation management and see that we should examine it in a broader sense as diversity in management. Diversity, equity, and inclusion are emerging factors as the overall concept of responsible research and innovation. Without softer skills in the repertoire, it is not possible to exploit all aspects of multicultural and diverse RDI projects. As experienced professionals in the field, we have acknowledged the fact that cultural dimension has a lot to offer to RDI EU project management.

Conclusions

Theoretical implications

Good innovation management and success of EU RDI projects is important for business and developments in the technical fields, but more importantly, important for our societies as innovation is key in solving several global environmental, societal and humanity related challenges. EU funding is public funding and collected from European taxpayers, however, little research is conducted in how innovation management and leadership could be strengthened to ensure success. Reviewed literature offers several leadership and innovation management frameworks and factors that are important to consider, which our chosen success factors investigated was also based on, but it might be challenging for coordinators to prioritise and in practice, choose what skills and tools to focus on. It is also typical for EU RDI projects to have substance experts of their fields acting as coordinators of the projects, which means that they might not be primarily trained in project management and leadership. As far as the authors are aware, evidence has not been previously collected and documented about these EU projects from coordinators and project participants. Our study provides new data, and based on that data we formulated a concrete and prioritised list of key success factors to aim for to ensure success of EU RDI H2020 and HE projects.

Managerial implications

There are multitude of important factors that need to be considered to manage successfully project implementation of EU-funded RDI. Special characteristics of these RDI projects and analysis of our survey data led to the categorisation of success factors into the following categories: good practices to manage complex projects, coordinator related skills and qualities, and managing collaboration and multicultural projects. Regarding good practices, clear responsibilities of the different roles, clearness of the project plan,

high engagement and activity during project implementation were highlighted to be the most important good practices for successful project implementation.

Most important coordinator related skills and qualities can be categorised into active communication and listening skills, high motivation and competence, and strong leadership. Successful collaboration was linked the most to the motivation of the coordinator and project consortium as well as the management competence of the coordinator. To increase management competence of the coordinator of H2020 and HE projects, it is important to study and expand knowledge of the European Commission provisions and rules, and improve the project management skills in general. It is helpful to identify the personal traits, strengths, and weaknesses to grow as a project manager. To enhance collaboration and to successfully manage multicultural projects, the critical factors include inclusivity, active communication and listening, effective leadership, compassion and respect, and the establishment of trust. To be inclusive and lead multicultural projects, it is important to be open-minded and continuously educate oneself about diversity, equity, and inclusiveness. Tangible recommendations to improve project coordination include establishing co-management structures, like pairs or small groups, with different skills, strengths, and weaknesses to compliment, support and mentor each other. For example, instead of having only one work package leader of a complex multidisciplinary work package, there could two co-leaders, e.g. one from academia and one from the industry. Another example is where a project coordinator gets mentoring and guidance from a dedicated senior colleague, who is not engaged in the day-to-day operations of the project.

We recommend as an overarching framework prioritised three key success factors that project management should focus on: communication, trust, and collaboration. Communication and trust are further traced down to the coordinator (project manager) and consortium levels. The target of the prioritised key success factors is to produce manageable amount of success factors RDI project management professionals could focus on in their work.

Positive and open communication, and active listening skills are key. Practical recommendations to enhance effective communication could be, for example, asking frequent feedback and reflections on the thoughts and feelings of the project group. This could be done effectively in an anonymous and safe way utilising online tools such as Mentimeter or different polls. It is important to be aware of how and what type of questions are asked as they can affect the way how and in what way the project group is willing to engage. It is not enough just to ask feedback; it is important to go through the gathered feedback in an open and accepting way—all feedback needs to be acknowledged. For project managers, it is critical to be aware of intentional or non-intentional blocking. It is not the project managers' place to deny or block how somebody is feeling and thinking—implement rather 'yes, and' instead of 'no, but' mentality. It is also necessary to have a broad repertoire of communication tools to reach different types of people in a comfortable way. A good practice is to take the time to introduce everybody, e.g. via Tour de Table at both live and online meetings, especially in the beginning, but also throughout the project as people who work on the project change. Also, a good way to engage and enhance commitment to the project is to utilise project social media channels to promote project personnel and their roles and different expertise in the project.

Regarding internal project communication, it is important to have regular separate management-related and substance-related meetings. This helps to keep focus on the management and then RDI related substance without getting exhausted or overwhelmed. Having regular opportunities, e.g. in project internal results webinars, to present and discuss the specific project results in more detail is important. It creates a sense of progress and joint success, as well as catalyses collaboration and continuous successful project implementation.

Mutual trust is built through high motivation, competence, and active and responsible approach to dedicated project activities and roles. A trustworthy environment can be formed by prioritising that team members feel comfortable expressing their thoughts, ideas, and concerns. Project coordinators should have confidence that individuals assigned to specific project roles possess the necessary capacity and capabilities. Trust should be given proactively and not made conditional on personnel earning it. Project coordinators need to create safe environment and possibilities, e.g. face-to-face or live events, for project personnel to feel comfortable to bring up encountered issues. In building trust, incorporating risk management is essential. When it consistently appears on the agenda during management meetings and is systematically and transparently addressed, it reduces the hesitancy to address issues. Risk management can be enhanced by joint exercises where work package leaders come together into small groups to come up with suggestions for mitigation measures to challenging situations. Project coordinators for RDI projects should aim to create an accepting environment where it is natural to experience setbacks and openly discuss those failures, even celebrate them as VTT Technical Research Centre of Finland does with its 'Gala of Failures' concept (VTT, 2023). The RDI projects are ambitious and challenging by default, hence, failures are an integral part of developing and scaling new solutions or innovations.

Efficient collaboration is reached by nourishing inclusivity, creating a productive environment, e.g., through support and positive feedback and teamwork, and finally through good administrative practices like clear division of roles and responsibilities as well as documentation, and early scheduling and requests. It is a critical starting point that the project plan is formed as collaborative and cross-pollinating as possible. This can be concretely done by ensuring work packages involve representation from a wider range of stakeholders, instead of being executed solely by one or two partners. Horizontal non-substance work packages such as communication, dissemination, exploitation, as well as coordination and management bring together all project partners and are nourishing environments to establish and grow collaboration. Project coordinators should drive for partners' strong commitment in these tasks. This is easier when already in proposal phase it is ensured that all partners have resources these horizontal activities.

As a summary, our framework of three prioritised factors offers a solid starting point to start 'managing the unmanageable'. Active communication and good listening skills are key. Mutual trust is built through high motivation, competence, and active approach to dedicated project activities and roles. Efficient collaboration is reached by nourishing inclusivity and culture, creating a productive environment, and good administrative practices. We argue that communication, collaboration, and trust are closely interlinked and have synergies. For example, when the project coordinator successfully facilitates good communication and collaboration, these create trust. At

the same time, good communication and trust build stronger collaboration. To gain more insights, project coordinators can reflect more on the presented top 15 success factors and their own leadership skills and style, and even further by deep diving into the overall 80 factors that we formed based on literature and our extensive experience in EU RDI project coordination.

Ideas for future research

As there is little research conducted in the specific framing and scope of EU H2020 and HE RDI projects, the field should be studied more in detail. As also stated in the studies of e.g. Abbasi et al (2022) and Oeij et al (2017), more research outside the developed frameworks and concepts is needed to understand the perspectives and experiences of individuals and organisations. The authors see that investigating more about the backgrounds and expertise of coordinators would be beneficial to understand better the starting point and readily skills of those who coordinate projects, especially in the field of project management and leadership. Also, the specificity and special characteristics of different technical fields, different countries and cultures should be studied more in detail to gain a deeper understanding on innovation management of EU-funded RDI projects.

Abbreviations

CA	Consortium Agreement
EC	European Commission
EEA	European Economic Area
EU	European Union
GA	Grant Agreement
GAP	Grant Agreement Preparation
GDPR	General Data Protection Regulation EU 2016/679
H2020	Horizon 2020, funding programme 2014–2020
HE	Horizon Europe, funding programme 2021–2027
NGO	Non-governmental organisation
RDI	Research, development, and innovation
RTO	Research and technology organisation
SME	Small and medium enterprises
VTT	Technical Research Centre of Finland Ltd
WP	Work Package

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Author contributions

ATL researched the literature for different factors and generated the first version of the survey, then analysed the raw data, produced the results, and illustrated them. RH contributed to completing the survey design and identifying the survey participants. Together, ATL and RH analysed the results for the discussion and made the conclusions. Both circulated the survey among networks and have been involved in the writing process.

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Availability of data and materials

All data analysed during this study are included in this published article and presented in results. The raw datasets generated during the current study are not publicly available due to sensitivity, but are available from the corresponding author on reasonable request.

Declarations

Competing interests

The authors ATL and RH declare that they have no competing interests.

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References

- Abbasi, E., Amin, I., & Siddiqui, S. (2022). Towards developing innovation management framework (IMF) for ICT organizations at Pakistan. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-022-00231-6>
- Alias, Z., Zawawi, E. M., Yusof, K., & Aris, N. M. (2014). Determining critical success factors of project management practice: A conceptual framework. *Procedia - Social and Behavioral Sciences*, 153, 61–69. <https://doi.org/10.1016/j.sbspro.2014.10.041>
- Amade, B., Ubani, E., Oghene, E., Omajeh, E., Anita, U., & Njoku, P. (2015). Critical success factors for public sector construction project delivery: A case of Owerri, Imo State. *International Journal of Research in Management Science and Technology*, 3, 2321–3264.
- Bergmann, T., & Karwowski, W. (2018, June 27). Agile project management and project success: A literature review. *Advances in human factors, business management and society*. AHFE 2018. advances in intelligent systems and computing, 783: 405–414. https://doi.org/10.1007/978-3-319-94709-9_39
- Chevrier, S. (2003). Cross-cultural management in multinational project groups. *Journal of World Business*, 38(2), 141–149. [https://doi.org/10.1016/S1090-9516\(03\)00007-5](https://doi.org/10.1016/S1090-9516(03)00007-5)
- European Commission. (2021). *EU grants. AGA—annotated model grant agreement*. Retrieved from https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf
- European Commission. (2022a). *Grant management*. European Commission. Retrieved from <https://webgate.ec.europa.eu/funding-tenders-opportunities/display/OM/Grant+management>
- European Commission. (2022b). *Horizon Europe Work Programme 2023–2024. 13. General Annexes*. European Commission Decision C(2022)7550 of 6 December 2022. European Commission. Retrieved from https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-13-general-annexes_horizon-2023-2024_en.pdf
- European Commission. (2023). *Horizon Europe*. Retrieved 3 1, 2023, from https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes/horizon-europe_en
- Frefer, A., Mahmoud, M., Haleema, H., & Almamlook, R. (2018). Overview Success Criteria and Critical Success Factors in Project. *Industrial Engineering & Management*. <https://doi.org/10.4172/2169-0316.1000244>
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597–607.
- Iqra, S. K., Kauppila, O., Fatima, N., & Majava, J. (2022). Stakeholder interdependencies in a collaborative innovation project. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-022-00229-0>
- Jain, R., Triandis, H., & Weick, C. (2010). *Managing research, development and innovation: managing the unmanageable* (3rd ed.). Wiley John Wiley & Sons Inc.
- Jansen, W., Warmenhoven, B., Fikkers, D. J., & Poel, M. (2014a). *How to successfully manage a Horizon 2020-funded project*. Retrieved from https://ec.europa.eu/research/participants/data/ref/h2020/other/gm/h2020-guide-to-research-pm_en.pdf
- Jansen, W., Warmenhoven, B., Fikkers, D. J., & Poel, M. (2014b). *Study on Assessing the Research Management Performance of Framework Programmes Projects*. European Commission. Retrieved from <https://www.technopolis-group.com/wp-content/uploads/2020/02/Research-Management-Performance-of-projects-in-FP6-FP7-and-Horizon-2020.pdf>
- Kaasa, A., Vadi, M. (2010). How does culture contribute to innovation? Evidence from European countries. *Economics of Innovation and New Technology*, 19(7), 583–604. <https://doi.org/10.1080/10438590902987222>
- Kaasa, A., Vadi, M., & Varblane, U. (2014). Regional cultural differences within European countries: evidence from multi-country surveys. *Management International Review*, 54, 825–852. <https://doi.org/10.1007/s11575-014-0223-6>
- Kaufmann, C., & Kock, A. (2022). Does project management matter? The relationship between project management effort, complexity, and profitability. *International Journal of Project Management*, 40(6), 624–633. <https://doi.org/10.1016/j.jiproman.2022.05.007>
- Khan, I. S., Kauppila, O., Farima, N., & Majava, J. (2022). Stakeholder interdependencies in a collaborative innovation project. *Abstract Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-022-00229-0>
- Kilduff, E., & Cormican, K. (2022). Do you really understand me? An analysis of cultural intelligence in global projects. *Procedia Computer Science*, 196, 824–831. <https://doi.org/10.1016/j.procs.2021.12.081>
- Klessova, S., Engell, S., & Thomas, C. (2022). Dynamics of couplings and their implications in inter-organizational multi-actor research and innovation projects. *International Journal of Project Management*, 40(5), 547–565. <https://doi.org/10.1016/j.jiproman.2022.05.003>
- Krastina, A. (2021). International Project Management competence as a bridge to success. *Lumen - Lapin ammattikorkeakoulun verkkolehti* (3).
- Oeij, P. R., Gaspersz, J. B., van Vuuren, T., & Dhondt, S. (2017). Leadership in innovation projects: An illustration of the reflective practitioner and the relation to organizational learning. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-017-0062-3>
- Schopp, J., Goeken, M., & Möstl, M. (2019). Success Factors in Project Management. Systematic Review of Ten Years of Research. *Twenty-fifth Americas Conference on Information Systems*. Cancun. Retrieved from https://web.archive.org/web/20200710064037id_/https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1282&context=amcis2019
- Smiljic, S., Aas, T., & Mention, A.-L. (2022). To join or not to join? Insights from cooperative RD&I projects. *R&D Management*, 53(2), 260–278. <https://doi.org/10.1111/radm.12560>
- Smith, P. B., Peterson M. F., David, C. (2008). *The Handbook on cross-cultural management research*. SAGE Publications. ISBN 1452261814, 9781452261812.
- Soleas, E. K. (2020). Leader strategies for motivating innovation in individuals: A systematic review. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-020-00120-w>

VTT. (2023). *VTT Technical Research Centre of Finland*. Retrieved from Fostering the culture of learning at VTT Gala of Failures 2021: <https://www.vttresearch.com/en/news-and-ideas/fostering-culture-learning-vtt-gala-failures-2021>

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