IEA

International Ergonomics &
Human Factors Association

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Triennial Report of the International Ergonomics Association

2021-2024

The global federation of
ergonomics and human factors societies.
Founded in 1959.

Published by IEA Press, 2024
ISBN: 978-0-9976041-5-3

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1 President's Report

José Orlando Gomes, IEA President

As I outlined in my candidacy statement for the election of the 21st IEA President, the central axis of the priorities for the current term of office was guided by the seven strategic policies of the IEA defined by former President Yushi Fujita during the 2015-2018 term and later reaffirmed and expanded on by former President Prof. Kathleen Mosier between 2018 and 2021.

The current and previous mandates faced enormous challenges, especially the Covid-19 pandemic, which required much effort, energy, and resilience from the entire Executive Committee (EC), as well as the entire structure of the IEA, including Networks, Federated and Affiliated Societies, and other internal and external stakeholders.

The cooperation, motivation, and patience of the EC members were crucial for the introduction of organizational innovations using the IEA toolkit, the Participatory Project Design Tool kit (P2DT), the characteristics of which are outlined in Section 5.3 of this report. The use of the toolkit was an effort to be responsive to the needs of various stakeholders, especially Federated Societies. A focus was placed on two issues: 1) ensuring clear reporting of structures and activities to the IEA Council and 2) ensuring sustainability of IEA activities. These innovations included the implementation of co-chairs in permanent Standing Committees and Ad Hoc Committees. These were fundamental to maintaining the activities of the previous committees and expanding the number of projects and actions in this administration, especially since we started this mandate entirely virtually, with a largely renewed team. This has allowed the team to mobilize resources from stakeholders and maintain the financial sustainability of the IEA, despite the post-Covid economic instability, according to the financial reports in this document.

A key characteristic of the current EC term has been a focus on building collaborative efforts/projects across the various Standing and Ad Hoc Committees, with an emphasis placed on education. A brief summary of these actions, activities, and projects is provided below, in accordance with the strategic policies that undoubtedly provided the framework to the IEA Executive, helping it to fulfil its mission and objectives consistently and continuously on a global scale.

Policy 1. Stakeholder Engagement

The Communication and Public Relations Committee (CPR) was fundamental in continuing the activities developed during the previous administration, such as the IEA *NewsBriefs* Bulletin and the continuity and expansion of webinars in cooperation with the Science, Technology, and Practice Committee. We held workshops in Latin America, Africa, and Asia based on the Participatory Project Development Toolkit (P2DT) that led to consistent collaborative projects described ahead. Supported by digital infrastructure that allows thousands of people to access these events, the IEA Technical Committees and the Future

of Work Ad Hoc Committee mobilized speakers on a large scale. Please visit the IEA YouTube page to see the online webinars organized over the last three years.

Policy 2. Collaborate and Strengthen Networks

Communication and collaboration with IEA Networks has assumed increasing importance as the number of IEA member societies continues to grow, and the IEA leadership has focused on networks as a means to reach and engage members more efficiently. During this term of office, the IEA Networks were actively engaged in both the development of educational projects and the work of building new societies. Algeria, Bulgaria, and Romania were accepted as Federated Members, and others are in progress from Latin America, Africa, and Asia, such as Ghana, Vietnam, Bangladesh, Angola, Bolivia, Panama, and the Caribbean Region. The growth in the number of societies is exciting for the IEA, and the continued growth of existing societies, particularly within Latin America, has also been welcome. We are, however, concerned about declining membership numbers in some larger and more established Federated Societies in Europe, Northern Asia, Australia, and North America, and, clearly, the new EC will need to make this a priority going forward.

Policy 3. Contribute to Science, Technology, and Practice

Contributions to science, technology, and practice include, most importantly, the preparations for the IEA2024 Congress, our world-class vehicle for disseminating knowledge about HFE, and, secondly, the meticulous work of publishing the scientific contributions from the IEA2021 Congress. Of particular mention here, is the partnership with the journal *Work*, among others. These efforts are exceptional, as they strengthen and leverage the scientific production of HFE on a global scale and enhance the building of academic and professional careers in HFE. This has been a long-standing role of the Triennial Congress. IEA webinars and collaborative projects described in this Triennial Report also represent notable contributions to science, technology, and practice. Additionally, the IEA's annual and triennial awards effectively mobilize the international human factors/ergonomics community and recognize members who have contributed significantly to the science, technology, and practice of HFE around the world. The HFE world is expanding, and this is reflected in the formation of new Technical Committees, as well as new partnerships emerging for the organization of new conferences, such as the one planned for 2026 in the area of Informal Work in partnership with ICOH, IOHA, the newly formed Latin American Doctoral Program in Colombia, and a global network of universities.

Policy 4. Promote Education, Certification, and Professional Standards

After years of incessant work, the doctoral program in HFE for Latin America and the Caribbean Region began in August 2022, based at the Universidad del Valle, Cali, Colombia, in cooperation with the National University of Colombia. The first cohort had 15 students from six countries in the region: Mexico, Colombia, Ecuador, Peru, Chile, and Uruguay. The second cohort started in 2023 with 9 students also from 6 countries, and a third cohort with 12 students coming from Latin America, and for the first time one student from Africa. Besides the Colombian universities, the program includes other universities in Latin America from countries such as Chile, Brazil, Uruguay, and Argentina, as well as the Conservatoire National des Arts et Métiers (CNAM) in Paris, Québec-Montreal University, Rhodes and Witwatersrand University in South Africa, Tsinghua University in China, and

University of Occupational Health in Japan. Other initiatives are emerging in various regions, such as graduate program in Asia and Africa, to meet important demands for HFE, as well as to meet specific demands in countries such as Vietnam, Argentina, Ghana, and Nigeria.

Policy 5. Strengthen Relationships with External Partners

During this term of office, the IEA significantly strengthened its ties with external partners through memoranda of understanding and joint projects involving IEA leadership and members, such as the new initiatives developed with the ILO and WHO, who are both long-time partners. These connections enhance the IEA's role as a knowledge base and as an international representative of HFE scientists and professionals, and they allow collaboration with organizations whose primary focus may not be HFE, but for whom HFE is an essential component of their purpose and mission. In turn, these relationships promote our science and discipline in conferences and joint meetings that would otherwise not include the recognition of HFE, and they allow us to contribute broadly to science, technology, and practice. This collaboration has resulted in several joint publications that integrate various aspects of worker well-being and HFE. Besides the long-standing memoranda of understanding with the International Occupational Hygiene Association (IOHA) and the International Commission on Occupational Health (ICOH), the IEA has new collaborative memoranda of understanding with the International Social Security Association - Machine and Systems Safety (ISSA-M&SS), and with the International Society of Pharmacovigilance (ISoP). It is worth mentioning all the effort undertaken by this administration to structure a more permanent and coordinated relationship in the area of standardization, both with external stakeholders, such as the International Standards Organization (ISO), and with internal stakeholders, such as the IEA Networks and Federated and Affiliated Societies, through the newly formed Ad Hoc Advisory Group on Standardization (AGS).

Policy 6. Strengthen IEA's Infrastructure

Several major efforts enhanced the development of IEA's infrastructure, with the development and improvement of the team for the use of technology and social media networks (mentioned above), the reinforcement of the organizational design through the implementation of co-chairs in all committees, and the “completion” of the Congress Model. The introduction of co-chairs across the standing committees brought more human resources into the EC work and allowed for better regional representation and feedback on needs while simultaneously ensuring a better-distributed knowledge base (cognitive HFE in action) for incoming committees to continue with existing projects. This successful experience allowed the realization and expansion of activities and projects and the expanded outreach to HFE communities on a global scale, as evidenced by the IEA’s leadership team description in Section 3.2.4. These experiences provide a basis to propose definitive organizational changes in the IEA structure and will (hopefully) lead to their formal implementation during future administrations. This is fundamental to allow the development of systemic and synergistic intercommittee collaborative projects, increasingly involving internal and external stakeholders. Work on the development of comprehensive guidelines for the conduct of IEA Triennial Congresses was started during the previous triennial term and continued during this term under the leadership of the Development and Promotion Committee. This work was published early 2024 but is expected to be work that is updated and enlarged as experience from each Triennial Congress is gained. Members of the Science, Technology, and Practice Committee argued successfully that the visibility and

professionalism of the IEA would be well-served by having a “corporate identity,” composed of a uniform appearance of all products. This project was completed in early 2024 and has been steadily implemented since then.

Policy 7. Maintain a Future Focus for HFE

IEA's future focus is clear in activities such as the continuation of the Ad Hoc Committee for the Future of Work, which contributed enormously to the dissemination of issues associated with this theme through a series of popular webinars involving Federated Societies in many regions of the world. These initiatives are producing a sharper awareness of topics and areas that must be addressed at this moment of technological disruption, which is producing diverse results, and will certainly decisively impact our way of working and living in the future. Another front is the establishment of a subcommittee that will produce a White Paper on Artificial Intelligence and HFE, while simultaneously tackling issues of sustainability and acknowledging that informal work is here to stay. The large number of online events and conferences, as well as the hybrid IEA2024 Congress itself, reflects the trend of reaching an increasingly larger and more diverse audience.

Certainly, I feel honored to have been the 21st President of the IEA during these turbulent times and to have served with such an excellent Executive team, which worked tirelessly with our co-chairs for the success of this administration. I am immensely thankful for their hard work and would like to recognize them individually: Maggie Graf, Vice President/Secretary General; Thomas Alexander, Vice President/Treasurer; Kathleen Mosier, Immediate Past President and Awards Committee Chair; Andrew Todd, Strategic Development and Implementation Committee; Jonathan Davy, Communications and Public Relations Committee Chair; Takeshi Ebara, Professional Standards and Education Committee Chair; Nancy Black, Science, Technology, and Practice Committee Chair; Elina Parviainen, Development and Promotions Committee Chair; Anindya Ganguli, International Development Committee Chair; Andrew Thatcher, Future of Work Ad Hoc Committee Chair; Myung Yun Hwan, Chair of the IEA2024 Organizing Committee; Shin’Ichi Fukumi, Standardization Advisory Group Chair; and Takashi Kawai, ICT Director, who managed our previous website and its re-creation, and continues to support us. I would like to thank Lynn Strother, who was with us at the beginning of the administration, and Aleksandra Gamper, who replaced her very early in our term. Both have been invaluable as our Secretariat Administrators, interacting successfully with our members. Thank you to all EC members for their extraordinary efforts, described in this Triennial Report. It has been a rewarding and invaluable experience working with these extraordinary people.

Finally, the IEA Seven Policies have been the driving force in this mandate, guiding us to interact with members of our societies and a variety of stakeholders worldwide, and designing and implementing a variety of projects on a broader scale than before. It was a challenging and wonderful experience, but it will certainly require efforts and continued work from the next IEA Executive and Council.

The table below presents a summary of activities developed by the IEA’s leadership team (President and EC members) together with many Federated and Affiliated Societies, IEA Networks, and external stakeholders where the President was personally involved. More details of these activities are given in the remainder of this report. As President, I would like to emphasize is that the specific actions of reaching out were always collective and often affected the entire EC, and certainly not all of them are listed here. It has been my policy to

not undertake any travel unless it was at least partially financially supported by local stakeholders. This ensures their commitment and IEA's responsibility to other members.

Table 1.1 President's personal involvement 2021-2024

Activity	2021	2022	2023	2024
Conferences and Meetings (virtual)	Indonesia, Bolivia, Colombia (SURA), Chile, Mexico, Spain, Colombia (PhD program), Brazil, Uruguay, India, Peru, Ecuador, HFES, Ulaergo, ACED, FEES, BRICS+, ADEA/Argentina, Tsinghua/Kingfar, and ISSA	Argentina (UTN), Taiwan, Croatia	JES, Colombia (PhD program), Ecuador, and Abergo webinar Indonesia, Peru, Croatia	Ghana, Colombia
Conferences and Meetings (in person)	Argentina	India, Cuba, Colombia	Argentina, Japan, South Korea, China, France, Colombia (2), Panama, and Mexico Germany (ISO), Italy, IEA EC/Council, Chile, HFES, ABERGO Brazil, Colombia, Germany, Tunisia, ACED/ BRICS+ conference	China, Indonesia, Vietnam, Japan, South Africa, Panama, Colombia (twice), Cuba, Morocco (ICOH), and Ghana
Officers weekly online meeting	Practically every Tuesday, with participation of the officers, Past President, SDI Chair, and IEA Secretariat Administrator (except year's-end break)	Practically every Tuesday, with participation of the officers, Past President, SDI Chair, and IEA Secretariat Administrator (except year's-end break)	Practically every Tuesday, with participation of the officers, Past President, SDI Chair, and IEA Secretariat Administrator (except year's-end break)	Practically every Tuesday, with participation of the officers, Past President, SDI Chair, and IEA Secretariat Administrator (except year's-end break)
Activity	2021	2022	2023	2024

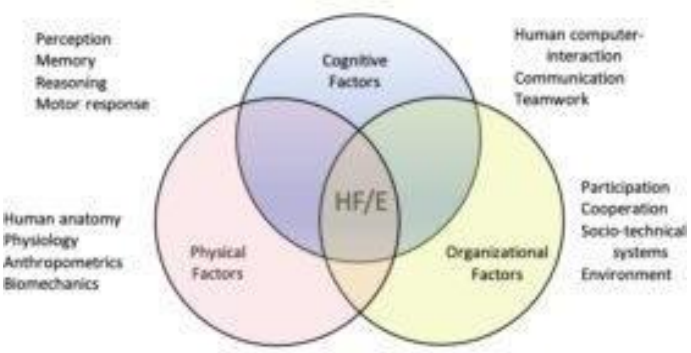
Online standing and ad hoc committee meetings including IEA2024	Monthly (PSE/ID, DP, etc.)	Monthly (PSE/ID , DP, Caribbean HFE, Bolivia, Ecuador, JES/CNAM)	Monthly (PSE/ID, DP, Caribbean HFE, Bolivia, Angola, Ecuador, JES/CNAM, Sub-Saharan graduate program, Asian graduate program, IEA2024 etc.)	Caribbean HFE, Sub-Saharan graduate program, JES/CNAM, Asian graduate program, IEA2024
Technical Committees meetings	Assistance	Assistance	Assistance	Assistance
Journal: *Work*, *Human Factors*, etc.	Assistance	Article review	Article review	Assistance

2 About the discipline of human factors/ergonomics (HFE)[1]

2.1 Definition and applications

The word *ergonomics* — "the science of work" is derived from the Greek *ergon* (work) and *nomos* (laws). Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design to optimize human well-being and overall system performance. The terms *ergonomics* and *human factors* are often used interchangeably or as a unit (e.g., human factors/ergonomics – HFE, E/HF or HF/E), a practice that is adopted by the IEA.

Although HFE practitioners often work within only one economic sector, industry, or application field, the science and practice of HFE is not specific to any one domain. HFE is a multidisciplinary, user-centric integrating science. The issues HFE addresses are typically systemic in nature; thus, HFE uses a holistic, systems approach to apply theory, principles, and data from many relevant disciplines to the design and evaluation of tasks, jobs, products, environments, and systems. HFE considers physical, cognitive, sociotechnical, organizational, environmental, and other relevant factors, as well as the complex interactions between the human and other humans, the environment, tools, products, equipment, and technology.



To practice effectively, human factors/ergonomics professionals who are specialists in a single domain or discipline must address issues and challenges with sufficient consideration of all the relevant elements of HFE. This assumes a broad understanding of other HFE areas; however, actual problem solving requires participatory approaches through consultation with HFE specialists in different domains as well as specialists in other relevant fields.

2.1.1 Participation in system design

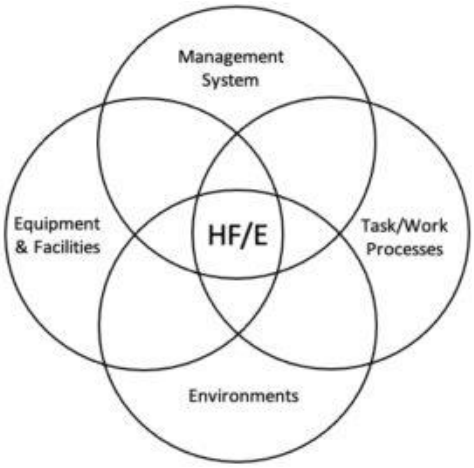
HFE contributes to safe and sustainable systems through a unique combination of three drivers for intervention:

(1) HFE takes a systems approach, using a systematic, iterative, step-by-step process;

(2) HFE is design-driven; and

[1] Revised from IEA Triennial Report 2021.

(3) HFE focuses on optimizing two closely related outcomes: performance and well-being.



HFE practitioners recognize the need for participation of all stakeholder groups (*participatory human factors/ergonomics*) in system design. Effective HFE is indispensable to support our life and work in the 21st century; without attention to HFE, system design will not support the sustainability of work, organizations, or societies.

2.1.2 Stakeholders of HFE

Any person or group of people that can affect, be affected, or perceive themselves to be affected by an HFE decision or activity is a stakeholder of HFE. Stakeholders are inter-related and include:

- System influencers – e.g., competent authorities such as governments, regulators, and standardization organizations at national and regional levels.
- System decision makers – e.g., employers and managers, those who make decisions about requirements for the system design, purchasing system, implementation, and use.
- System experts – e.g., professional HFE specialists, professional engineers and psychologists who contribute to the design of systems based on their specific professional backgrounds,
- System actors – e.g., employees/workers, product/service users, who are part of the system and who are directly or indirectly affected by its design and who, directly or indirectly, affect its performance.

Stakeholders for HFE can represent many levels, domains, and types of influence and investment, such as:

- International level – regulatory officials and policy makers, international NGOs
- National level – government, law and policy makers, regulators, national NGOs
- Educational level – universities, applied sciences programs, vocational education, professors, teachers, students
- Practice level – CEOs and managers in companies, designers of work and work systems in different fields, practitioners in domains relevant to HFE.

2.1.3 Value of HFE in the world of work

Work systems are made up of humans, the tools, processes, and technologies they use, and the work environment. HFE contributes to the creation of safe and sustainable work systems by considering the interrelatedness of human, technical, and environmental components, and the potential effects of work-system design changes on all parts of the system. Members of the HFE community recognize the need for participation of all stakeholders in system design groups (i.e., Participatory HFE).

HFE simultaneously contributes to the economic health of organizations by enhancing worker wellbeing, capability, and sustainability, maximizing performance, and reducing direct costs as well as indirect costs from productivity losses, quality deficiencies, and employee turnover. Workplaces that are designed with HFE principles have better employee performance and produce better business results. HFE design in work systems is simply and unquestionably good business.

2.1.4 Resources used in this section

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Read, G.J.M., Salmon, P.M., Goode, N., & Lenné, M.G. (2018). A sociotechnical design toolkit for bridging the gap between systems-based analyses and system design. *Human Factors and Ergonomics in Manufacturing & Service Industries*,*28*(6), 327-341.

Principles and Guidelines for HFE Design and Management of Work Systems. (2019) Joint Document by IEA and the International Labour Organization (ILO).

Wilson, J. R. (2014). Fundamentals of systems of ergonomics/human factors. *Applied Ergonomics (45), 5-13.*

Dul, J., Bruder, R., Buckle, P., Carayon, P., Falzon, P., Marras, W. S., Wilson, J. R., & van der Doelen, B. (2012). A strategy for human factors/ergonomics: Developing the discipline and profession, *Ergonomics*, *55:4*, 377-395, DOI: 10.1080/00140139.2012.661087.

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3 The IEA

3.1 Founding and Development

The International Ergonomics Association was founded in 1959. At the time, only three human factors/ergonomics (HFE) societies were operating (in the United Kingdom, the USA, and Germany). Members of IEA were not societies, but individuals. In 1976, due to the growing number of national and regional societies and to the desire to be able to interact with world organizations such as the World Health Organization (WHO) and the International Labour Organization (ILO), IEA decided to become a federation of societies.

Since then, the history of IEA and of human factors/ergonomics has been a story of expansion in terms of the number of Federated Societies (from 11 in 1976 to 55 in 2023). Expansion has also occurred in terms of scope of interests. The range of topics covered by the Triennial Congresses now includes healthcare, organizational design and management, manufacturing, standards, human reliability, product design, aging, agriculture, rehabilitation, and more. Attendance has grown (120 participants in 1961, 519 in 1976, 1600 in 1997, 3100 in 2000, and 1576 in 2018, the date of the last in-person Congress). Variations in attendance at IEA Congresses are influenced by their location in the world and by global events at the time, including pandemics, wars, and global financial crises.

Finally, expansion has occurred in the integration of human factors/ergonomics into society. Today HFE is not only an academic discipline; it is also a profession. This has led to the development of professional certification systems in HFE and of training programs in the discipline.

The International Ergonomics Association is now a mature organization, with responsibilities at a global level. IEA is a federation of human factors/ergonomics societies around the world. IEA's mission is to elaborate and advance human factors/ergonomics science and practice and to improve the quality of life by expanding its scope of application and contributions to society. IEA interacts with like-minded organizations such as WHO, ICOH, ISQua, and ILO for specific activities, such as developing and implementing HFE programs in small- and medium-size companies in manufacturing and in agriculture. Special emphasis has been given to developing countries in Africa, Asia, and South America.

IEA was re-registered in Zurich, Switzerland, in 2009 as an international not-for-profit organization. However, the requirement to register the bylaws in German created an administrative difficulty, given that English is the working language of the IEA. In 2017, registration was moved to Geneva, Switzerland, and a Swiss resident maintains the ex-officio position of IEA Director. The paper IEA Archives are hosted by CNAM in Paris, France, and the digital archives are on our website server.

3.2 IEA Governance

3.2.1 The IEA Council

IEA is an international not-for-profit organization, led by a Council composed of representatives from the Federated Societies and three elected officers: the President, Vice President/Secretary General, and Vice President/Treasurer. Only the members of Council

have the right to vote. At the time of this report there are 53 Federated Societies situated in Africa, Asia, Australasia, Europe, and North and South America. The Council makes all major decisions concerning the IEA, including the election of officers, changes to By-laws and Operating Procedures, approval of general policy, admissions, and the budget. The Council officially admits all new members of IEA and may terminate membership for good cause.

3.2.2 The Officers

The officers are elected by Council at a meeting in conjunction with the Triennial Congress to serve for a period of three years. The President may serve only one term. The Vice President/Secretary General and Vice President/Treasurer may be re-elected for a second term. The officers are responsible for ensuring that the management of IEA affairs is in accordance with the IEA's mission and goals.

The main duties of the officers are:

3.2.2.1 President

- Represents the IEA
- Chairs Council and Executive Committee meetings
- Appoints chairs to the executive subcommittees (Standing Committees)
- Forms new Ad Hoc Committees
- Oversees the work of the Executive Committee

3.2.2.2 Vice President/Secretary General

- Provides day-to-day administration of the IEA, including communication and documentation responsibilities
- May also assist in other tasks as a Vice President at the discretion of the President
- Has the final responsibility for the IEA website

3.2.2.3 Vice President/Treasurer

- Is responsible for the accounting of IEA funds
- Conducts budget analysis and projections
- Provides financial management
- Establishes new sources of revenue
- May also assist in other tasks as a Vice President at the discretion of the President

3.2.3 IEA Executive Committee

Day-to-day administration is performed by the Executive Committee, which consists of the elected IEA officers, the Chairs of the Executive Subcommittees (Standing and Ad Hoc Committees), the Immediate Past President, and the Chair of the next IEA Congress.

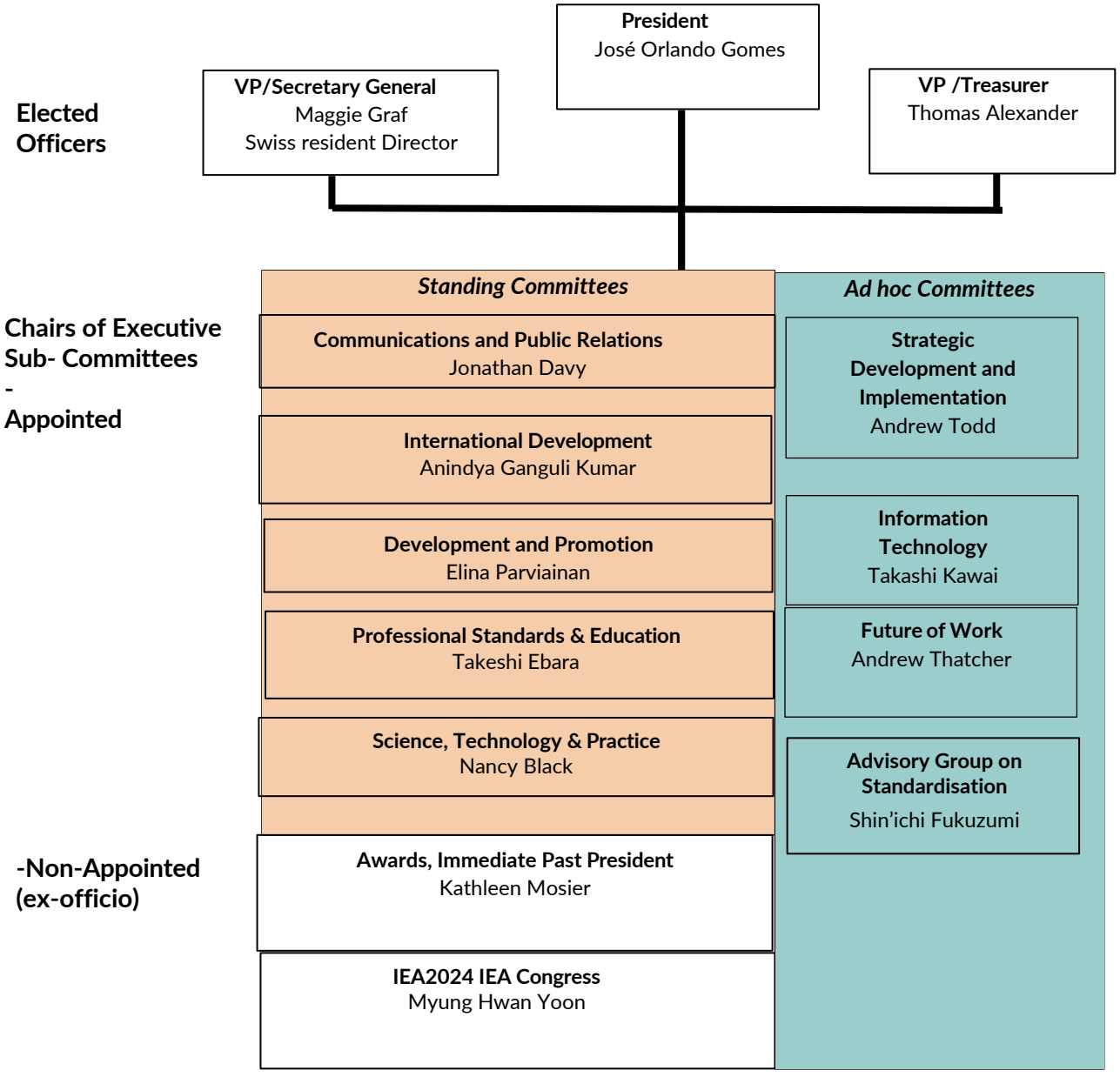
The Council has approved the creation of six Standing Committees. Traditionally the Awards Standing Committee is chaired by the Immediate Past President. The chairs of the other five Standing Committees and any other Ad Hoc Committees or positions are appointed by the President. Ad hoc positions/committees can be created by the President for specific tasks, but their activities cease with the change of Presidents,

unless the incoming President chooses to retain them during his or her term.

According to the law of the Canton of Geneva, Switzerland, where the IEA is seated, there must be a Swiss resident on the Executive Board. The current VP/Secretary General fills this role.

At the Council meeting of 2023 the decision was made to create an Advisory Group on Standardization to coordinate the activities of IEA members involved in working with the International Standards Organisation (ISO). This body is headed by a person appointed by the President, but it is neither a Standing Committee nor an ad hoc committee. The current President appointed the head of this Advisory Group to the Executive Committee in an ad hoc capacity.

Figure 3.1 IEA Executive Committee Members 2021-2024



3.2.3.1 Secretariat Administration

The members of the Executive Committee are volunteers, and no monetary benefits are given to them; however, a Secretariat Administrator is contracted for approximately 10 hours of work per week. This means that almost 100% of IEA funds support the implementation of IEA's mission and goals. The current Secretariat Administrator is Aleksandra Gamper, who took the role in January 2022. The IEA is formally seated in Geneva, Switzerland, but there is no physical office.

3.2.4 Executive (Sub-)Committees

3.2.4.1 Standing Committees

The Standing Committees accomplish much of the work of IEA. They are generally composed of the chair and a group of co-chairs, who are responsible for specific functions or activities. Several Standing Committees have, or coordinate the activities of, subcommittees. Information on their activities is contained in the strategic policy reports in Sections 0 to 0.

Awards. The Awards Standing Committee manages the awards process, whereby IEA recognizes individuals for their contributions to the field.

Chair Kathleen Mosier, Immediate Past President, USA

Co-Chair Mario Vidal, Brazil

Selection Committee Chairs

Mario Vidal, Brazil – IEA/ Kingfar Student and ECR Awards;
IEA/Tsinghua Award

Andy Imada, USA – Thomas R. Waters Memorial MSD Scholarship Award
Pascale Carayon, USA and Patrick Dempsey, USA – IEA John Wilson Award
Pascale Carayon, USA– KU Smith Award

Communications and Public Relations. The Communications and Public Relations (CPR) Standing Committee is responsible for outreach to internal and external stakeholders. It coordinates the production of the IEA *NewsBriefs* and the social media presence on Facebook, X, and LinkedIn.

Chair Jonathan Davy, South Africa

Co-Chairs Nokubonga 'Sma' Ngcamu-Tukulula, South Africa; *NewsBriefs*
Sadeem Qureshi, Canada; Social Media
Katie Buckley, Australia, Early Career Members

Development and Promotion. The Development and Promotion (DP) Standing Committee explores and coordinates new policy options and proposals and assists in the development and implementation of new programs and initiatives relevant to the functioning and effectiveness of IEA itself. The committee develops and coordinates plans and proposals concerning IEA policies, operation, and structure, and assists in development of policy recommendations to better serve Federated Societies and the international human factors/ergonomics community.

Chair Elina Parviainen Finland

Co-Chairs for Development of Congress Model

Yushi Fujita Japan
Alexandr Volosiuk Russia

International Development. The International Development Standing Committee promotes, coordinates, and implements activities, mainly but not exclusively in industrially developing countries, by supporting local and regional initiatives concerning research, development, training, and conferences. This is the leading committee for the IEA goal: *"To stimulate enhanced contributions of the ergonomics discipline to global society."*

Chair	Anindya Ganguli, India
Co-Chairs per Region	
Latin America	Martin Rodriguez, Argentina
	Paulo Antonio Barros Oliveira, Brazil
Africa	Nelson Ekechukwu, Nigeria
	Paulo Antonio Barros Oliveira (Portuguese-speaking countries)
Asia	Liang Ma, China
	Jennifer Gutierrez, Philippines
North America	Chris Reid, USA

Professional Standards and Education. This committee is concerned with implementation of the IEA goal *"To promote the advancement of the science and practice of ergonomics at an international level*." The Professional Standards and Education (PS&E) Standing Committee compiles and disseminates information relevant to offerings in ergonomics at educational institutions and educational materials, including instructional methods, aids, and standards. Goals include the development of internationally accepted guidelines for endorsement of human factors/ergonomics certification programs, including guidelines for curricula to satisfy IEA Core Competency Standards. This committee also explores strategies to enhance support of human factors/ergonomics education programs.

Chair	Takeshi Ebara, Japan
Co-Chairs per Region	
Africa	Tahar Hakim Benchekroun, France
Latin America	Joao Alberto Camarotto, Brazil
Asia	Yassierli, Indonesia
Co-Chair Certification Subcommittee	Marion Edwin, New Zealand

Science, Technology, and Practice (STP) The Science, Technology, and Practice Standing Committee promotes and coordinates the exchange of scientific and technical information at the international level. It coordinates the activities of the 29 current IEA Technical Committees (considered subcommittees of the STP standing committee), which offer a communication platform for members of Federated Societies with specific areas of interest. The committee supports the organization of scientific and technical events and reviews applications for IEA endorsement and sponsorship of scientific events and publications. STP assists in the planning of the IEA Triennial Congress scientific program. Along with the PS&E committee this committee implements the IEA goal *"To promote the advancement of the science and practice of ergonomics at an international level."*

Chair	Nancy Black, Canada
Co-chairs	
	Rosemary Seva, Philippines - Technical Committees (TCs) and Webinars
	Karen Lange Morales, Colombia - Publications

3.2.4.2 Ad Hoc Positions and Committees 2021-2024

Strategic Development and Implementation. The role of this person is to support the Executive Committee by coordinating the implementation of the current IEA strategic policy.

Chair Andrew Todd, South Africa

Future of Work. This person continues the work of the previous task force to explore the changes in the world of work around the world and how it impacts on the profession.

Chair Andrew Thatcher, South Africa
Co-chair Wei Zhang, China

Information Technology. This person is responsible for the smooth functioning of the IEA website and has been responsible for the coordination and communication with the external company that manages the website.

Chair Takashi Kawai, Japan
Members
Maggie Graf (VPSG)
Aleksandra Gamper (Secretariat Administrator)
Kian Leong (Web Developer)

Advisory Group on Standardization. The role of this group is to support the Category-A liaison with ISO/TC159 and to promote international standards inside and outside of IEA (Federated Societies, Affiliated Societies, and Networks). This Ad Hoc Committee was first formed in 2023.

Chair Shin'ichi Fukuzumi, Japan. ISO/TC159/SC4 Liaison
Members
Peter Nickel (Germany): ISO/TC159/SC1 Liaison
Anindya Ganguli (India)
Edwin Yap (Singapore): ISO/TC159/SC5 Liaison
Ronggang ZHOU (China)
Manoela Lahoz (Brazil)
Yushi Fujita (Japan)
IEA president (José Orlando Gomes): ISO/TC159 Liaison

4 Financial report[2]

The triennial financial report provides an overview about the financial situation of IEA in the recent term from 2021 until 2024. It describes the general basis of the finances and the ways of operation, including an overview about the accounts and accounting rules as well as the general procedures of financial operations. A major part of the financial report is the development of assets, liabilities, and equity of IEA as well as revenues and expenditures for this term. The report draws some conclusions about the situation and develops a few recommendations for future financial operations and management.

4.1 Overview of accounts

IEA currently has two bank accounts at UBS Bank in Zurich, Switzerland. One account is a U.S. Dollars (USD) account, and the second one a Swiss Franc (CHF) checking account. This is necessary because most of IEA's financial operations are handled in USD, so this account is our current account in practice. Moreover, it also facilitates the preparation and presentation of financial numbers and indicators for an overview about IEA's financial situation. The second account in CHF is for payments within Switzerland and for credit card payments. For administrative reasons, it also serves as the official current account for UBS Bank. During usual operations, only a few accounting entries are handled in CHF. UBS also provides two credit cards for direct payments and online payments. These payments are posted to the current CHF account.

In addition to the two accounts, since 07/2023, IEA has invested USD 350,000 as a fixed-term deposit with a term of 3 months at UBS in a UBS trust fund. Previously the development of the financial investment situation was not specific, and it was decided not to take any financial risk. Because of constant, positive developments since then, the investment has since been continued, first with a term of 3 months and in 07/2024 with a term of 6 months until 01/2025. The investment will be continued in future if not cancelled.

For practical operations IEA also operates a PayPal account. It is used for Federated Societies (FS), Affiliated Societies (AS), and individual Sustaining Members to transfer small amounts if direct bank-to-bank transfer is not possible. If an amount is received via PayPal, it is transferred quickly to the current account at UBS. Except for necessary exceptions, IEA does not have a cash account for receipt of money or for payments.

Table 4.1 Account information

	UBS basic account / CHF	UBS basic account / USD	PayPal
Purpose	Official current account for UBS	Main operational account	Exceptions for transfers to IEA
Receipt of payment	Transfer from USD current account	Membership fees	Membership fees (exception)
	Transfer from Paypal	Revenues	

[2] Chapter contributed by Thomas Alexander, Vice President and Treasurer

	UBS basic account / CHF	UBS basic account / USD	PayPal
Payments	Swiss payments (e.g., accounting)	Reimbursement of expenditures	Transfer to CHF current account
	Credit card payments	Contracts, purchases, and services	
		Transfer to CHF current account	

4.2 Overview of accounting system and operation

Accounting rules are essentially the same as those adopted in previous years. The following summarizes the important rules:

- All final financial numbers are presented in USD. Most financial operations are performed in USD, and the annual financial report for members is in USD as well. The occasional operations in CHF are booked in their corresponding ledgers. All transactions are consolidated in USD.
- The IEA fiscal year coincides with the calendar year, January 1 through December 31.
- Revenues are noted and booked when received, and expenses are booked when incurred, as accounts payable or paid.
- Membership dues of previous years paid during a year are allocated to the revenues of that year.
- Membership dues paid for coming years are allocated to the liabilities.
- Table 4.2 (below) shows the accounting titles for revenues and expenditures.

Table 4.2 List of accounting titles for revenues and expenditures

Revenues	Expenditures
Membership dues (FS and AS combined)	Meetings
Sustaining member contributions (corporate and individual combined)	Representation & Outreach
	Office
Capitation fees	Awards and Awards Committee
Funds Contribution	Committees: • ID • PSE • STP • CPR • Future of Work • DP • IEA Congress
Exchange rate gains	Exchange rate losses
Interests	Bank charges
Miscellaneous	Grants
	Website
	Miscellaneous

- Whenever possible, expenses are allocated to meetings, the different IEA Standing Committees, or Ad Hoc Committees rather than to "Representation & Outreach."
- The "Meetings" classification holds only (but not all) expenses specifically related to IEA Executive Committee activities that are not allocated to a special IEA Standing Committee or Ad Hoc Committee.
- Most of IEA Officers' and EC members' travel for "Meetings" and "Representation & Outreach" are now partially covered by the host society of the meeting or by the local society. In exchange, the IEA Officers and EC members are involved in national events that are co-aligned; e.g., annual congresses or conferences of the member society or other events. These costs do not show in the report but have increased recently and support the operation of IEA significantly.
- This also applies to paying for the accommodation, meals, and local transportation of IEA Officers and EC members. Some of the host societies or local societies have also started to cover air travel as well. IEA appreciates this additional financial support of its activities.

For financial operation, the transition from a self-developed Excel spreadsheet to the professional accounting software Banana (Ver. 9.0.5) has continued during this term. At present both systems are operated in parallel: The Excel spreadsheet provides a brief overview about the various accounting positions for the different bank accounts and credit card positions. It also allows a comparison to the financial situation before 2019 and the calculation of several benchmarks. The Excel spreadsheet is also important for the audit of the financial situation. On the other hand, the professional accounting software Banana (Ver. 9.0.5) provides fast and cost-efficient exchange with the accounting contractor and the Swiss tax authorities. This reduces the need for adjustments and corrections significantly (and, thus, reduces the overall costs for accounting). It has been observed that more complex accounting as, for example, correct consideration of open positions at the end of a fiscal year (e.g., open payments, pre-paid services, accrued payments) and conversions between USD and CHF were handled correctly with the accounting software and are very

difficult to consider in an Excel spreadsheet. Therefore, the way of parallel accounting operations will be continued in future.

4.3 Assets, Liabilities, and Equity

The development of assets, liabilities, and equity between 2021 and 2024 is shown in the following tables. It should be considered that the period between 2020 and 2022 has been a challenging time for many national and international societies because of the pandemic. This is also true for IEA. During this time, several events had to be cancelled or converted into a virtual or hybrid format, introducing a large level of uncertainty for financial planning and budgeting. This is reflected in the annual balance sheets for IEA as well, because large variations occurred.

The development of assets and liabilities is shown in Table 4.3.

Table 4.3 Assets and Liabilities of 2021–2023 (as of December 31) (USD)

Assets (USD)	Y2021	Y2022	Y2023
Savings Account	439,535	494,152	122,873
Term Deposit – Investment Account	./.	./.	350,000
Seed Money Receivable	./.	./.	./.
Advancements	2,396	1,111	./.
TOTAL ASSETS	**441,931**	**495,263**	**472,873**

Liabilities (USD)	Y2021	Y2022	Y2023
Dues advanced received	193	500	574
Accounts payable (incl. accrued expenses)	17,147	37,526	9,570
Earmarked Funds	48,187	43,377	43,377
Total Liabilities	65,527	81,403	53,521
Total Equity	376,404	413,860	419,351
TOTAL LIABILITIES	**441,931**	**495,263**	**472,873**

Despite the challenges caused by the pandemic, the financial development of IEA has been positive. IEA's equity has increased by USD 42,699 (2021), USD 37,455 (2022) and USD 5,491 (2023) during the term. This allows IEA to maintain its operations into the future. The surplus during the pandemic years 2020 until 2022 was caused by reduced expenses, especially by reduced travel, no physical meetings of the IEA EC, and only limited meetings with IEA member societies and networks. This has only been possible because of a well-established network that allows for keeping in contact and being involved in activities. It is obvious that this would only work for a limited time; otherwise, the contact with member societies would suffer. In addition, it introduced a "risk of financial success" because the goals of IEA are, according to its By-laws, "to promote the advancement of the science and practice of human factors/ergonomics at an international level; to stimulate enhanced contributions of the human factors/ergonomics discipline to a global society; and to develop effective communication and collaboration with Federated Societies." Therefore, the financial reserve (i.e., equity) of IEA must be maintained at a reasonable level. However, the

balance between revenues and expenditures must be considered as well to guarantee financial continuity and stability. The development in the recent term shows that IEA activities performed well to return to normal financial operations. In 2022 and 2023, networking and collaboration went back to normal operations, and the financial situation remained in balance so that the operations of IEA have become stable, and the investments in networking and infrastructure have paid off.

During 2021 and 2022, the financial situation was too unpredictable to plan fixed-term investments. The situation has improved in 2023 so that it was decided to invest USD 350,000 in a fixed-term investment of UBS Bank. According to UBS Bank information, this investment has no risk. The investment was limited to a term of 3 months because of uncertainty about financial conditions.

A significant 2021 financial event was the receipt of almost USD 33,000 of the Triennial Congress surplus. This surplus supports the IDC fund, so that the development of ergonomics and human factors in these regions can be supported significantly. During the term, payments from membership fees (i.e., of Federated Societies and of Sustaining Members) have also increased, resulting in new financial possibilities to support IEA development. Examples for this are higher overall budgets for awards and activities to support the global development of human factors/ergonomics, especially in Latin America and the Caribbean, but also in other regions of the world.

Figure 4.1 shows the financial development during recent terms. It also illustrates the financial surplus of USD 85,645 which has been used partially to increase our cash reserves and funds as a term deposit. Data for previous terms was taken from the recent triennial report.

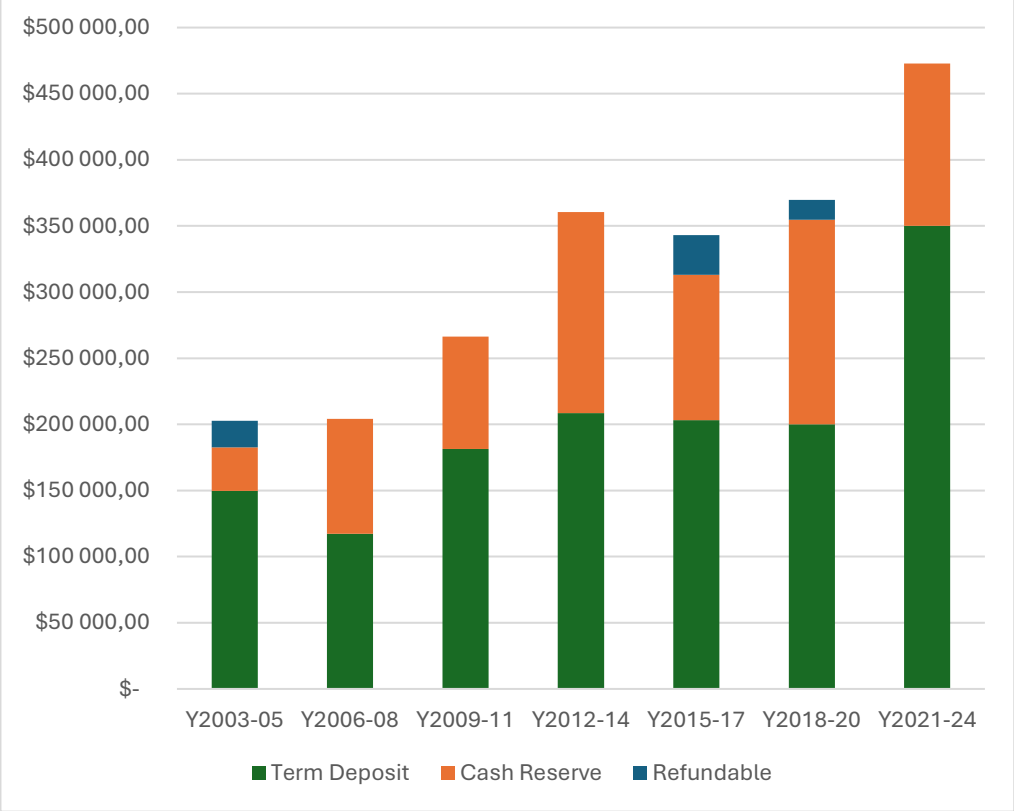


Figure 4.1 Trend of assets for the period from 2003-05 to 2021-24 (USD)

4.4 Revenue and Expenditures

An analysis of revenues and expenditures allows deeper insights into the financial situation and, thus, cash continuity. An overview of revenues, expenditures, and operating results for the 2021-2023 period are shown in Table 4.4, Table 4.5 on the following page and Table 4.6, respectively. The data were taken from the annual treasurer's reports, which have been approved by the Council in its annual meetings.

Table 4.4 Revenues per year, sums and averages (USD)

Revenues				Sum	Average
	Y2021	Y2022	Y2023	2021-2023	2021-2023
Membership dues	38,563	50,530	41,344	130,437	43,479
Sustaining member contributions	39,256	60,200	61,156	160,612	53,537
Capitation fees	18,157	./.	./.	18,157	./.
Exchange Rate Gains	./.	./.	405	405	./.
Miscellaneous	4,716	13,187	12,418	30,321	10,107
Total Revenues	100,692	123,917	115,323	339,932	113,310

The subdivision of revenues is illustrated in Figure 4.2. The payment of membership dues differs between the years. However, the variance is explained by the fact that some societies pay for the actual year and some for the most recent year because of internal processes. Moreover, some societies also pay for recent years so that creates a bias of the statistics.

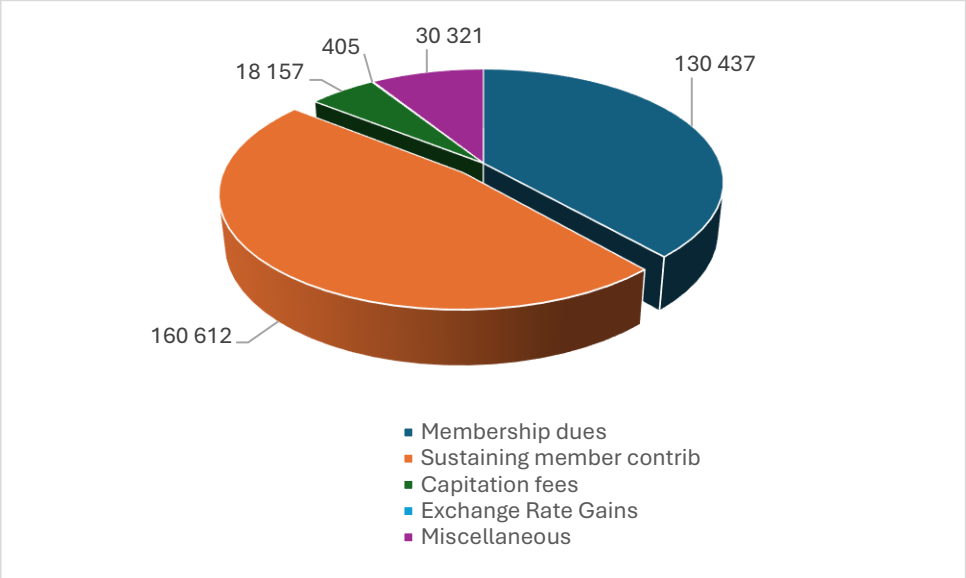


Figure 4.2 Breakdown of total revenues for the period 2021-2023 (USD)

In addition, the percentage of contributions from Sustaining Members, especially from corporate Sustaining Members, has increased and is now larger than the revenues from member societies. This shows the growing importance of IEA also for other organizations,

institutions, and companies. It also enables IEA to support individual developments of excellent students, early-career scientists (ECSs), and senior researchers by means of additional awards.

Table 4.5 Expenditures per year, sums and averages (USD)

Expenditures				Sum	Average
	Y2021	Y2022	Y2023	2021-2023	2021-2023
Meeting	0	6,804	16,518	23,322	11,661
Representation & Outreach	0	13,554	9,609	23,163	11,582
Office	24,315	13,077	24,252	61,644	20,548
Awards Committee	16,000	36,147	31,835	83,982	27,994
ID Committee	0	3,216	5,594	8,810	4,405
PSE Committee	0	0	0	0	0
STP Committee	0	1,740	1,592	3,332	1,666
Future of Work	0	0	1,855	1,855	1,855
DP Committee	0	686	3,060	3,746	1,873
CPR Committee	0	1,522	5,486	7,008	3,504
IEA Congress CP	0	499	539	1,038	519
Bank charges	615	998	2,812	4,425	1,475
Exchange Rate Losses	329	94	0	423	141
Website	8,252	8,000	5,500	21,752	7,251
Miscellaneous	8,483	124	1,184	9,791	3,264
Total Expenditures	57,994	86,461	109,836	254,291	84,764

Expenditures, again, show clearly the effects of the pandemic. In 2021 there were no meetings or costs associated with Representation & Outreach. It also required additional support by the office on a temporary basis. However, first ideas for solutions were generated and first steps taken. In 2022 these activities started and required some investments in technology (e.g., IT services for distribution of information, and webinars). In addition, increased contributions from Sustaining Members allowed an increase in the number of awards for students, ECSs, and senior researchers in 2022. In 2023, costs for operations were similar to that of the years before – except for the fact that meetings and related travel have become more expensive, as all of us know.

The proportions of the total sums of the different items are shown in Figure 4.3. The largest amount for expenditures is by the Awards Committee, which supports the development of individual (future) researchers and scientists from member societies. A slightly smaller amount is spent for the office. This includes payment for office services, for accounting services, and for software. Consequently, this was an investment focus for the recent term. The other items are primarily meetings, which are shown together with representation and outreach.

What is not shown in this figure is the large amount of time that members of the EC, subcommittees, TCs and others contribute during the term.

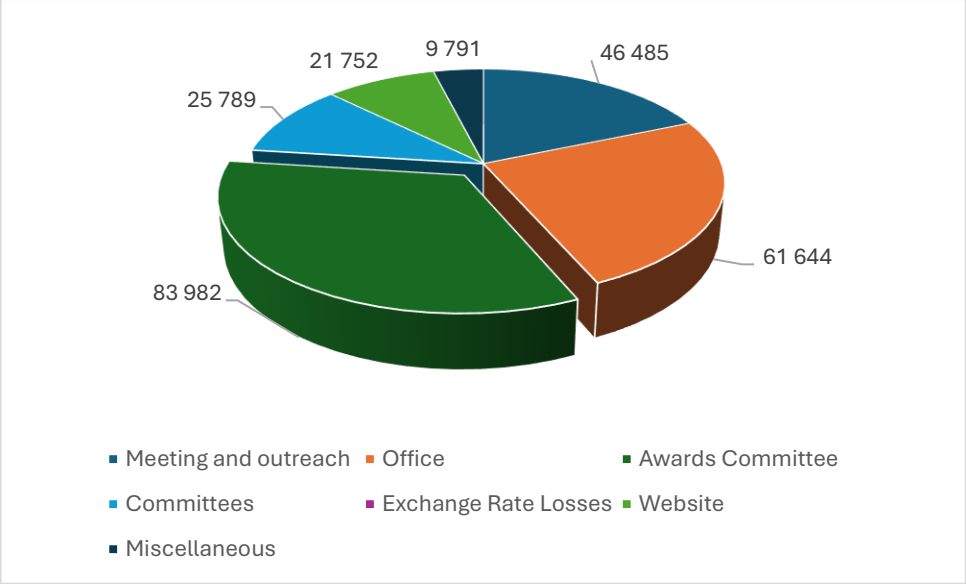


Figure 4.3 Breakdown of total expenses for the period 2021-2023 (USD)

As a result of the positive ratio between revenues and expenditures, the operating results for the 2021-2023 period have resulted in a surplus for these years. In 2023, the surplus was significantly smaller, but this shows again that operations are back to normal and the continuity of financial operations is guaranteed.

Table 4.6 Balance of operating result (USD)

Operational Results				Sum	Average
	Y2021	Y2022	Y2023	2021 -2023	2021 -2023
Surplus	42,698	37,456	5,487	85,641	28,547

A view on the trends of the recent development, as shown in Figure 4.4, reveals that revenues from dues are relatively constant, whereas expenditures and other revenues vary. During the last two terms, revenues were growing faster than expenditures, which is a positive trend. It supports continuity and creates new financial possibilities for supporting IEA developments.

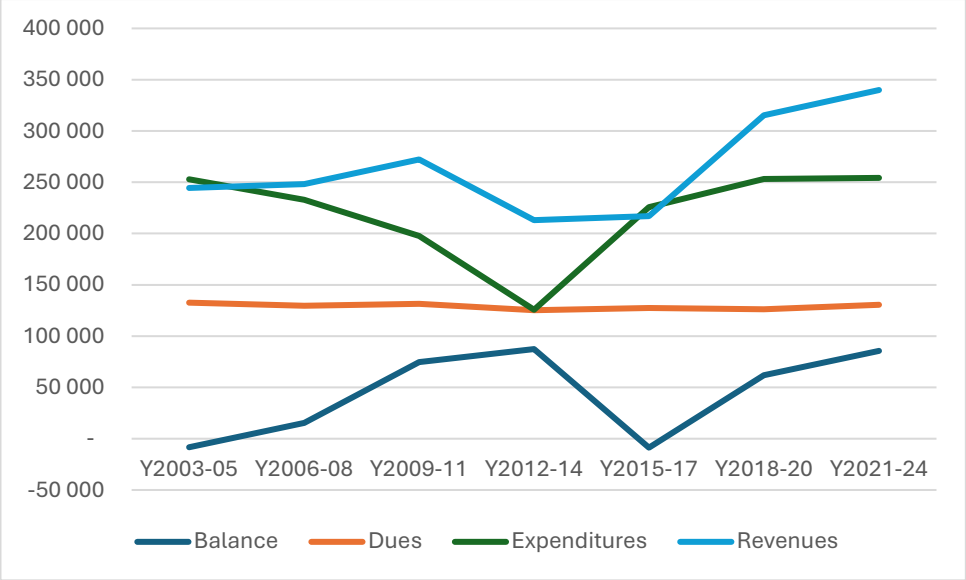


Figure 4.4 Trends of the total Revenues, total Expenditures, total Balance, and total Dues for the periods from 2003-05 to 2021-23 (USD)

The financial situation of IEA is considered to be stable and in good shape, with regard to both the cash reserve and cash continuity. Although expenditures have recently increased because of higher costs for services, revenues have also increased so that investments in new infrastructure and services in the past are considered to have paid off. This development should be continued in future.

4.5 Forecast

For the first time, in 2023 the interim financial report presented at the IEA 2023 Council meeting introduced a forecast of future expenditures. The motivation for this was that a forecast or estimate for the future budget has frequently been requested in the past; however, it was explained that a huge variation of revenues and expenditures might occur because of an unclear situation in the following year. This is primarily because a large amount of IEA expenses includes costs for meetings and travel; for example, to facilitate EC and Council meetings, events of member societies, and participating in meetings with other organizations or institutions. These expenses are difficult or impossible to estimate for the future, especially when venues for EC and Council meetings or other events are not specified during the previous year.

Therefore, a forecast always includes uncertainty. It considers expected revenues from membership dues, Sustaining Member contributions, and fixed annual payments for regular services (e.g., domiciliation fee, website maintenance), regular general IT services (e.g., Dropbox, Hightail, Constant Contact) and special payments (e.g., for awards). In addition, the forecast also considers payments for expected services with medium variation (e.g., costs of accounting contractor and IEA office) and high variation (e.g., travel expenses to EC and Council meetings).

A first comparison between the forecast and actual situation shows that, although revenues and expenditures were higher than expected and variations between the different positions

occurred, the summary of operations matched quite well. Therefore, the forecast will be continued in the future to allow monitoring of revenues and expenses during the actual term. However, it must be considered that many expenditures always include a large variation and errors. Consequently, the difference between the expected and actual financial situation might vary more strongly in the future.

4.6 Conclusion

Although year-to-year fluctuation is significant, IEA's financial performance seems steady in terms of the three-year period between the Triennial Congresses. This is still valid despite the challenging situation caused by the pandemic beginning in 2019. It also shows that several financial investments in IT services have paid off.

Many of those financial investments were taken to establish a broad range of IT services and to update the IEA website. They significantly support an exchange of information and files, and thereby foster international collaboration and outreach to IEA members. In addition, representation and outreach activities have started again and have also been very successful. As a result of this, new members have been attracted and the development of human factors/ergonomics in different regions and nations worldwide has been initiated and supported. Moreover, new formats (e.g., webinars and videoconferences) make new collaborations possible.

In parallel, expenditures have been kept constant. This was done by a closer involvement of IEA Officers, EC members, and subcommittee and TC members ind national events and activities. As a matter of fact, hosting societies provided free accommodations and/or meals and even travel support. This has become a good practice for the future and a good base for future operations.

Another observation is that reporting from the Federated Societies requires improvement. In the period 2022 until 2024 only 59% (on average) of the societies reported their number of members to IEA. The reasons for this are unclear, but it shows that there is a need for improvement. Moreover, this situation might also affect the IEA financial situation because the reported membership numbers are used for calculating the membership fee for each society. This is a major part of the revenues of IEA. According to the (limited) information that is available, member numbers of several societies are dropping slowly. This should be addressed in future so that this trend is stopped.

Finally, the transfer to professional accounting software as required by Swiss tax authorities, and the collaboration with a Swiss accounting contractor has been successfully established. Although challenges still remain because of the change from the Excel spreadsheet-based accounting system to a new system, the advantages clearly outweigh the disadvantages. This transition will have to continue in future.

5 Overview of Strategic Policy 2021-2024

5.1 IEA Objectives

The mission of IEA is to elaborate and advance ergonomics/human factors science and practice and to expand its scope of application and contribution to society to improve the quality of life, working closely with its constituent societies and related international organizations.

According to the By-laws the main objectives of IEA are:

- To develop more effective communication and collaboration with (and between) Federated Societies.
- To advance the science and practice of ergonomics/human factors at an international level.
- To enhance the contribution of the ergonomics/human factors discipline to global society

5.2 IEA Strategic Policies

IEA Strategic Policies were first developed during the presidency of Yushi Fujita starting in 2015. They were based on IEA's situation at the time, the general guidelines recommended in the Future of Ergonomics report (FoE)[3], and the overriding IEA objectives (described above). With only light revisions these policies were continued during the presidency of Kathleen Mosier and José Orlando Gomes up to the time of this report. The following seven chapters describe IEA activities according to the seven strategic policies.

Officers and Standing Committee chairs have coordinated their action plans in line with the policies. To do this a participatory planning and development tool (P^2DT) was developed by Andrew Todd and José Orlando Gomes. The tool is explained further in Section 5.3 below.

1. Engage stakeholders (Chapter 0)
2. Collaborate with and reinforce IEA Networks (Chapter 0)
3. Promote and contribute to HFE science, technology, and practice (Chapter 8)
4. Promote and contribute to education, certification, and professional standards (Chapter 0)
5. Strengthen relationships with external partners (Chapter 0)
6. Reinforce the infrastructure of IEA (Chapter 11)
7. Maintain a future focus for HFE (Chapter 12)

[3] Under the auspices of the Development and Promotion Standing Committee, an Ad Hoc Committee was assembled to examine the field and future directions of human factors and ergonomics. The final committee report was submitted in 2012: Jan Dul and others, "A strategy for Human Factors/Ergonomics: Developing the discipline and profession. The report is downloadable from: https://www.iea.cc/project/FINAL_REPORT_Future_of_Ergonomics_Committee_A_Strategy_for_Human_Factors_Ergonomics_22_January_2012.pdf.

The Standing Committee structure, which pre-dates the strategic policies, is not completely in line with these points, but the IEA Executive has the view that none of these themes can be addressed adequately by a single team, and most Standing Committees today contribute to each policy point in different ways. The aim is to move away from a "silo" approach and more towards collaborative work.

5.3 The P²DT tool[4]

To ensure that the design of the IEA Executive Committee activities is not ad hoc in nature but rather systemic, the participatory project design toolkit (P²DT) was developed over two IEA Executive Committee terms (2015-2021) and implemented in the current term. It is a framework for helping systemic HFE project design, integrating various HFE tools and methods into the various steps of the process. The P²DT assumes the use of participatory design approaches to support IEA and its internal stakeholders to orient and plan their development projects. As the figure below shows, the P²DT is designed in a stepwise fashion; however, it should be acknowledged that it is also highly iterative in design and has various outcomes from undertaking an analytical approach.

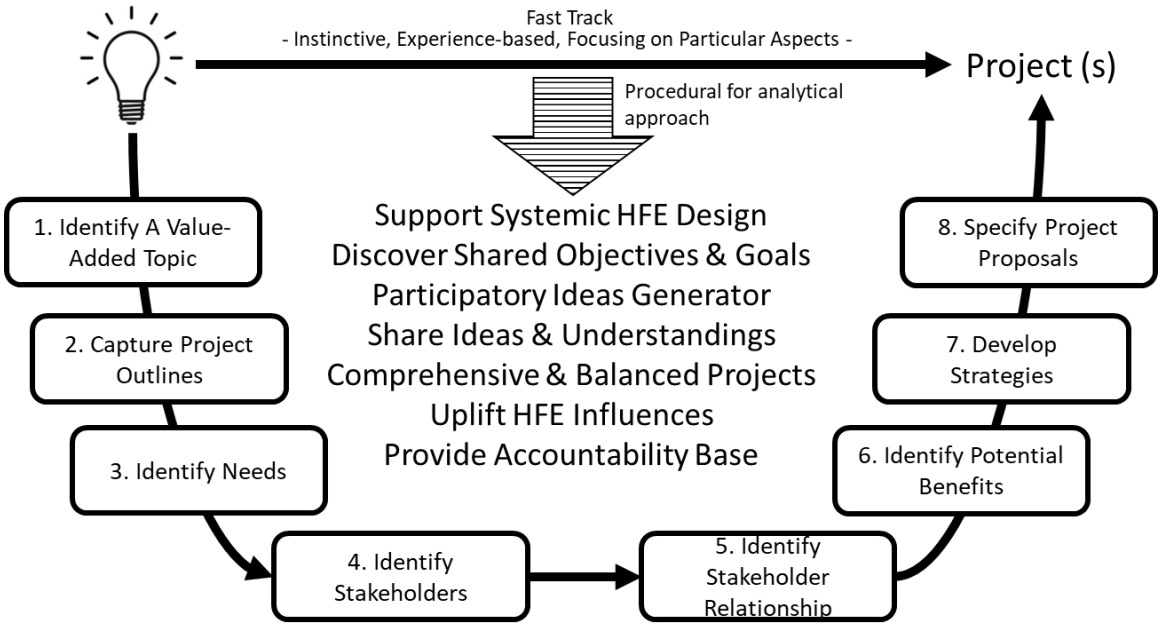


Figure 5.1 Participatory Project Design Toolkit analytical approach

This approach was advocated by the IEA because the explanatory power of systems approaches to design have been well established scientifically. Furthermore, by acknowledging that the IEA itself is a complex socio-technical system, it is open to the use of HFE tools for effective system design. For example, using HFE tools such as cognitive work analysis in steps 1-8 of the figure above, one can help to elucidate and describe the system and the factors that are likely to be influencing performance. Furthermore, McLean et al. (2017)[5] argued that it can be a useful platform for stakeholders to engage with all aspects of their system, critically and creatively to develop sustainable solutions. The steps of the P²DT first allow for the facilitation of identification of value-added topics and the

[4] Section Author: Andrew Todd, Chair of Ad Hoc Strategic Development and Implementation.
[5] McLean S, Salmon, P, Gorman A, Read G and Solomon C (2017). What's in a game? A systems approach to enhancing performance analysis in football. PLoS ONE 12(2): e0172565. doi:10.1371/journal.pone.0172565

needs that the ensuing project will be addressing. Once a clear need has been identified the stakeholders to be involved in the project, the relationship between these stakeholders, and the benefits that each of these stakeholders can derive from the project can be delineated. These steps are usually highly reiterative, as a clear picture of the various factors influencing the project and relationships between the various stakeholders becomes apparent. Subsequently a clear strategy for project implementation can be developed. Therefore, the activities of the current IEA Executive Committee have been guided and facilitated by the use of the P^2DT framework.

This is seen in this Triennial Report, in which details of the various committee activities are presented to illustrate the systemic nature of the project design and the various stakeholders involved. Furthermore, at its meeting in Santiago, Chile in 2023, the IEA Council identified a poor understanding of the various IEA activities among Council members (particular those Council members new to the role), and that the reporting structures did not make it easy to understand the purpose of many of the activities. The IEA Executive Committee also noted the difficulty in transitioning between Executive Committee terms, with new chairs finding it difficult to understand their roles and the existing activities of the IEA. This report has therefore attempted to address this by presenting the activities of the various standing committees in light of their connection to the IEA objectives and strategic policy.

The 2015-2018 Triennial Report highlighted the need to develop a long-term plan by the IEA to support the development and growth of HFE by addressing the shortfalls highlighted by the Dul et al. (2012) report on the future of ergonomics/human factors. In particular, the fact that the lack of high-quality educational programs and consequent lack of knowledge of the value of HFE was a significant barrier to be overcome by the IEA. The IEA has therefore embarked on a long-term project focused on building of local capacity through improved and new educational programs using the P^2DT as an underlying framework for the strategic development of these programs. An emphasis for these projects has been collaboration:

- across IEA standing committees (led by the Strategic Development and Implementation Ad Hoc Committee). In particular, the International Development and Professional Standards and Education Standing Committees have worked closely together on these projects
- with IEA Networks and Affiliated and Federated Societies
- with other internal and external stakeholders specific to the regional needs specified in the P^2DT process.

The details of these projects and the stakeholders involved can be found in the appropriate areas of the Triennial Report and so will not be repeated here. However, as an illustrative example of how the projects have progressed, the timeline for the development of the PhD program in Colombia, which focused on providing opportunities for HFE education across all Spanish-speaking countries in Latin-America is provided below.

The figure below shows the development of the PhD program in Colombia. (A full report is attached to this report in Chapter 9.1.1.) The report indicates the detailed process of exploring the various affordances and constraints on the development of the program and how this helped to shape the decision making and the eventual implementation of the program at the Universidad de Valle in Colombia. It also demonstrates the comprehensive nature of the engagement with internal and external stakeholders in an iterative process to ensure that the curricula developed spoke directly to the needs of local stakeholders, thereby demonstrating the added value of high-quality HFE education programs within the

Latin-American context. The first cohort of students was accepted into the new program starting in August 2022, with a total of 15 students from Chile, Uruguay, Peru, Ecuador, Colombia, and Mexico being accepted into the course. In 2023 the second cohort of PhD students entered the program with 9 students from 5 different countries, and in 2024 there were 12 students selected, one from Africa. The program has gone from strength to strength as illustrated by the International Ergonomics Meeting they hosted in June 2023, which had participation by more than 20 national and international universities and more than 600 attendees from around the world. The use of the P^2DT to build an understanding of local needs and the relationships between various stakeholders has been highly successful in shaping the strategies implemented to initiate the PhD program. This process has been replicated in the other educational projects reported elsewhere.

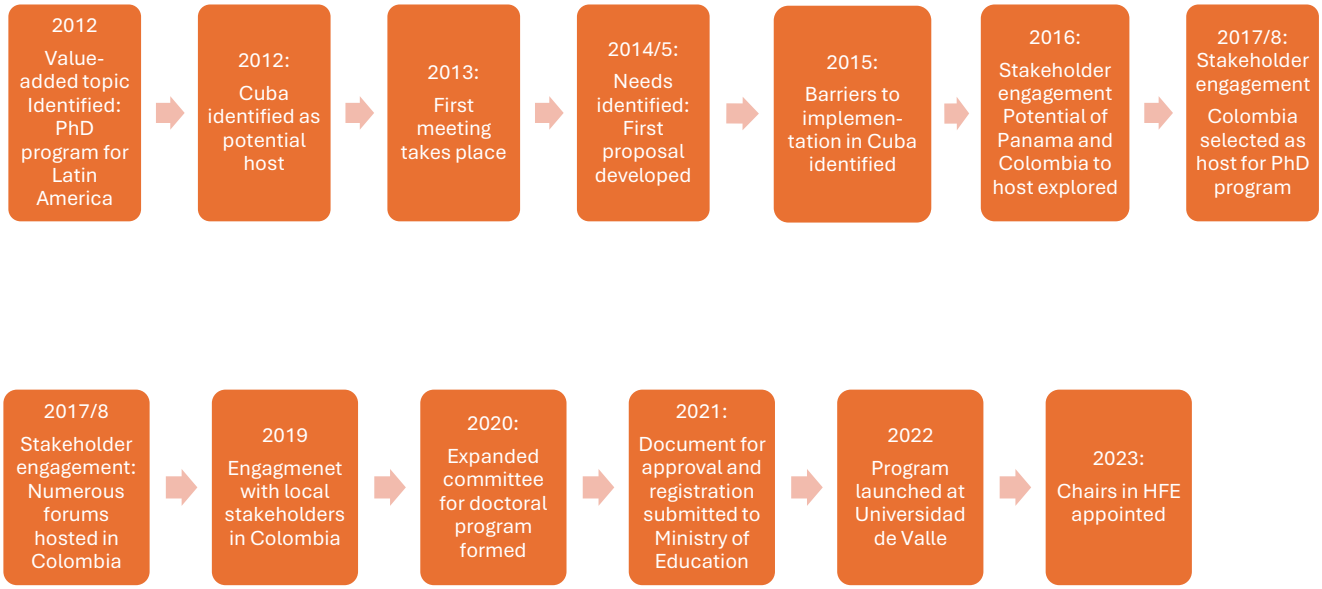


Figure 5.2 The timeline for the development of the Latin-American PhD program in Colombia

6 IEA Stakeholder Engagement

6.1 Current Society Membership

The main stakeholders of IEA are its members, some of which also form the Council, which is the highest governing body.

The IEA By-laws stipulate four categories of membership:

- Federated Societies, currently 55,
- Affiliated Societies, currently 2,
- IEA Networks, currently 6, and
- Sustaining Members (see below).

Several Federated Societies represent more than one country, so the global reach of the IEA is somewhat larger than 55 individual countries. The map below shows areas with Federated Societies and Affiliated Societies. [Note that Japan and Colombia have both a Federated Society and an Affiliated Society.]

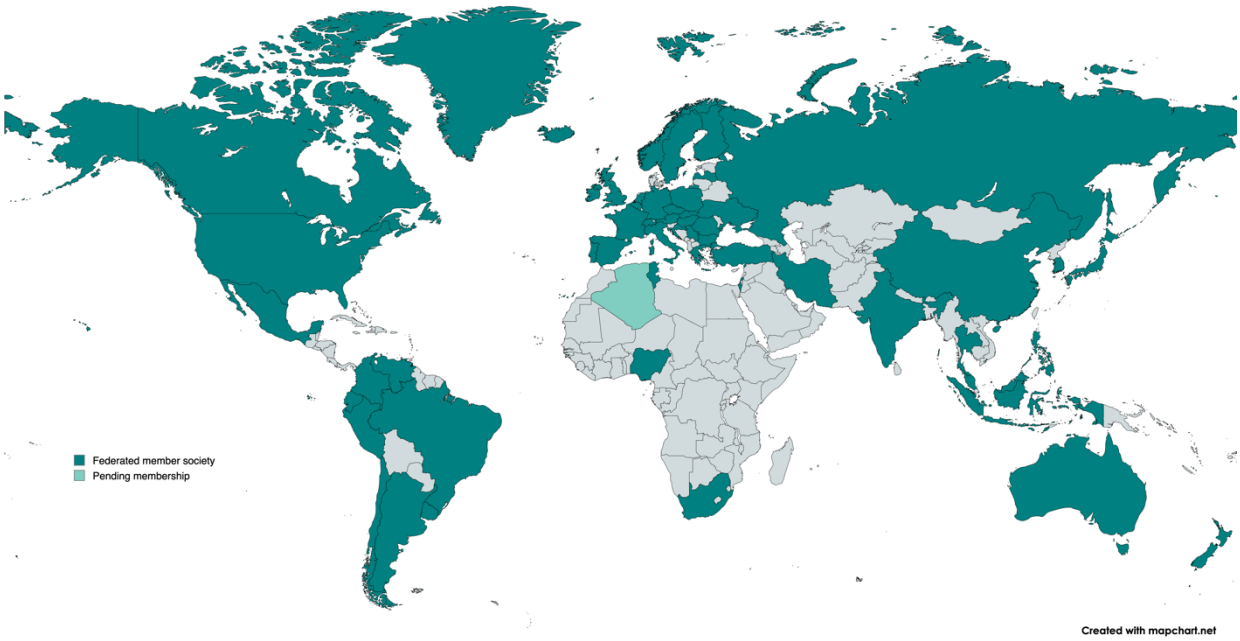


Figure 6.1 Map of the world showing countries with IEA Federated Societies in green.

The following sections describe the IEA Federated Societies, Affiliated Societies, and Sustaining Members. The IEA Network engagement will be described in Chapter

7.

6.1.1 IEA Federated Societies

Federated Societies are professional societies that have the main aim of promoting and disseminating human factors/ergonomics knowledge and practice. They have been admitted by the Council for having met and continuing to fulfil the eligibility criteria

provided in the IEA By-laws. They are bodies that elect a governing council from within their own membership and encourage the publication of research material and the development of human factors/ergonomics practice. They have voting rights and appoint representatives to Council based on the size of their membership.

During the 2021-2024 term three new Federated Members were added:

- The Algerian Association of Ergonomics, which was afterward required by local authorities to withdraw. The IEA has suspended the membership for the time being.
- The Bulgarian Association of Ergonomics and Human Factors.
- The Romanian Ergonomics and Workplace Management Society.

An application from the Ergonomics Society of Panama will be acted upon at the 2024 Council meeting.

There are two members within Europe that are currently suspended at their own request due to wars/international sanctions, which make running their societies and communicating with IEA too difficult: Russia and Ukraine. Because the society representing HFE specialists in Denmark officially left the IEA Federated Society member, the Nordic Ergonomics Society, practitioners from the area of Denmark are no longer part of IEA. Various IEA representatives worked to avoid this outcome, and an alternative solution is still being sought.

6.1.2 IEA Affiliated Societies

Affiliated Societies are other national or international professional societies that are ineligible for federated member status or have an interest in human factors/ergonomics but have their main purpose in an associated area. The current IEA Affiliated Societies are:

- Colombian Association of Researchers on Ergonomics
- Japanese Human Ergology Society

6.1.3 International Development[6]

The International Development Standing Committee has been working with a network of co-chairs and with the Professional Standards and Education Committee in three main regions of the world to build up educational resources and professional networks. The aim of these professional networks is to eventually build a national or regional society in areas where HFE is not yet well established. This supports the IEA objectives to advance the science and practice of ergonomics at an international level and enhance the contribution of the human factors/ergonomics discipline to global society.

6.1.3.1 AFRICA

Ghana

[6] The principal contributor of this section was Anindya Ganguli Kumar, Chair of the International Development Standing Committee.

At present, there are not enough members to form a society in Ghana. Initiatives to increase the membership (such as a master's program in HFE (described in detail in Chapter 9) are in progress.

Angola/Mozambique
Online meetings have been held, and an in-person meeting was conducted in June 2024. Representatives from the Ergonomics Society of South Africa, including Andrew Todd of IEA, are assisting with the formation of the respective societies of specialists. A working group was set up in Angola with some important stakeholders in the country, such as Sonangol, the Angolan State Oil Company, and the Superior Polytechnical Institute of Angola (ISPTEC).

6.1.3.2 ASIA

Bangladesh
Based on the interactions between AKG and the officers of the Bangladesh Ergonomics Society (BES), the BES has formally applied for membership of ACED. This application was approved by the ACED Executive Committee and by the ACED Council in the Council meeting held in December 2023; however, there are not enough members to comply with the eligibility requirements to apply for IEA membership (Federated or Affiliated). IDC is maintaining contact with the BES and supporting their activities with the aim of helping them to fulfil the IEA membership requirements.

Vietnam
The President of IEA visited Hanoi in March 2024 at the invitation of the National Institute of Occupational Health and Environment (NIOHE), along with Prof. Wei Zhang from the Chinese Ergonomics Society (CES) and Tsinghua University. It was agreed that CES along with Tsinghua University will provide a response to the three main requests presented by the NIOHE: HFE training, HFE standards, and assistance for founding a Vietnamese HFE society.

6.1.3.3 LATIN AMERICA

Central America countries
The International Development committee has been working to assist in the creation of new Ergonomics Societies in Latin America and the Caribbean Region that could be affiliated to ULAERGO and IEA in the future. Some countries in Central America (Nicaragua, Guatemala, Honduras, Costa Rica, and the Dominican Republic) already have small societies or interest groups in HFE. To become Federated Societies of IEA, they need to gain legalized registration in their own countries, which requires a formalization of their structures. Some of them are already affiliated to ULAERGO, such as Costa Rica, Nicaragua, and Guatemala. The latest work has been to put together a draft basic set of By-laws for the region, and the committee is now working on establishing a country for setting up the society headquarters. The Panamanian Ergonomics Society (Anaergo) is already legally constituted and has prepared an application for affiliation to IEA, which will be decided at the 2024 Council meeting.

In November 2022, the President and Immediate Past President of IEA participated in the Scientific Congress of Engineering and Architecture, of the Technological University of Havana to further the discussion about the formation of a Caribbean HFE Society and to get the support of Cuban ergonomists. Currently, there is a core group of Cuban professors,

many of them from the Universidad Tecnológica de la Habana (CUJAE), Matanzas, working on the project.

Bolivia
Meetings were held with the management group of the newly created Society of Ergonomics of Bolivia. IEA participated in the organization and presentation of panels and discussions at a congress organized by that entity and monthly online meetings with the society board were also held.

6.2 Sustaining Members

The IEA Sustaining Membership program supports the science and application of human factors/ergonomics worldwide. Academicians and practitioners accomplish the work of the IEA on a voluntary basis; however, many initiatives vital for the development of ergonomics and human factors as a unique science and profession cannot be funded from membership fees alone. Funds are thus needed to support the development of human factors/ergonomics worldwide, including in industrially developing countries. Funds are also required to disseminate HFE knowledge to industry and to society at large, to promote HFE education and competency standards, and to support the work of IEA Committees.

The program provides exposure and enhances the image of institutional members.

6.2.1 Organizational Sustaining Members

There are four levels of support for Organizational Sustaining Membership, and each level offers specific benefits. Sustaining Membership is typically granted on a three-year basis. The granting of IEA Sustaining Membership does not imply IEA endorsement or approval of an organization or company's products or services.

Organizational Sustaining Membership Benefits

Each of the four levels of organizational support offers specific benefits:

Gold level – US $ 1,000/year

- Listing on the IEA website on the Sustaining Membership page with an option of a short description about the sustaining member (160 characters).
- One complimentary registration for an IEA Triennial Congress for each three years of Sustaining Membership.
- Electronic copy of monthly IEA *NewsBriefs*.

Current gold-level member:

- Korea Occupational Safety & Health Agency (KOSHA)

Platinum level – US $ 5,000/year

- Listing on the IEA website on the Sustaining Membership page with an option of a short description about the sustaining member (160 characters) plus the organization's logo, with an active link to the member's corporate website.
- Official listing in the program of the IEA Triennial Congress.

- Two complimentary registrations for an IEA Triennial Congress for each three years of Sustaining Membership.
- Electronic copy of monthly IEA *NewsBriefs*.

Current platinum-level member:

- TeamScape LLC, USA

Diamond level – US $ 10,000/year

- Listing on the IEA website on the Sustaining Membership page with an option of a short description about the sustaining member (160 characters) plus the organization's logo on IEA website home page, with an active link to the member's corporate website.
- Official listing in the program of the IEA Triennial Congress
- Complimentary distribution of the organization's promotional materials at the IEA Triennial Congress and display of the organization's logo
- Three complimentary registrations for an IEA Triennial Congress for each three years of Sustaining Membership
- Electronic copy of monthly IEA *NewsBriefs*.
- An invited address by an IEA officer at a corporate function, can be included if desired.

Current diamond-level member:

- Elsevier, The Netherlands

Star level – US $ 25,000/year

- Listing on the IEA website on the Sustaining Membership page with an option of a short description about the sustaining member (160 characters) plus the organization's logo on IEA website home page, with an active link to the member's corporate website.
- Acknowledgment on the inside front cover of the Triennial Congress program brochure and official listing in the program of the IEA Triennial Congress.
- Free exhibit booth for distribution of promotional materials at the IEA Triennial Congress.
- Four complimentary registrations for an IEA Triennial Congress for each three years of Sustaining Membership.
- Electronic copy of monthly IEA *NewsBriefs*.
- An invited address by an IEA officer at a corporate function, can be included if desired.
- Additional benefits may be negotiated.

6.2.2 Individual Sustaining Members

Individual Sustaining Members are individuals who voluntarily support IEA through annual contributions, which can be allocated to specific activities or used as determined by the Executive Committee.

The following people are currently Individual Sustaining Members:

- David Caple

- Pascale Carayon and Peter Hoonnakker
- Andrew S. Imada
- Kazutaka Kogi
- Ernst Koningsveld
- Johan Molenbroek
- David Rempel

We thank these people for their commitment to our profession.

6.2.2.1 Survey of Sustaining Members

Towards the end of 2023, IEA Past President David Caple, volunteered to assist with a survey of current Individual Sustaining Members to assess their expectations and needs. The IEA thanks him for this work.

It was evident from this consultation process that IEA Sustaining Members have a strong bond and goodwill towards the IEA as a consequence of many years of personal involvement in the HFE education, research, and practice at an international level.

The IEA Executive is very appreciative of the financial support of Sustaining Members, as it assists IEA to continue to offer low-cost membership and support to small and struggling societies, particularly in low- and middle-income áreas, where the need for HFE is often great.

Following the survey the IEA offered some contact possibilities for Individual Sustaining Members to consider:

1. Participation at the IEA Triennial Congress

Although the majority of Individual Sustaining Members are no longer active in presenting their research or practice at the Congress, they have a strong interest in maintaining connections with previous IEA colleagues. The IEA Executive suggested offering Individual Sustaining Members an opportunity to obtain registration to the digital platform at the IEA 2024 Congress.

2. Keeping up to date with IEA activities: IEA Triennial Report

The Individual Sustaining Members will be provided with a digital link as soon as the Triennial Report is published.

3. Mentoring and Coaching of Students

Some Individual Sustaining Members who are still actively engaged in the profession have offered their services to mentor and coach HFE students, particularly those from developing countries. Such an independent support person would be extremely valuable, particularly one who provides students with opportunities to connect with the international research and practice community. The IEA has an informal network of early-career professionals (see Section 6.3), particularly from areas where HFE is not well established, and a link to this should be made.

6.3 Communicating with Stakeholders[7]

One of the main objectives of IEA is to encourage communication among the members of the Federated Societies. Particularly, there is a need to continue to engage with the Early-Career Community (inclusive of students, postdoctoral researchers, and early-career researchers and practitioners, who are an integral community that the IEA needs to serve better to ensure the sustainability of IEA, its Federated Societies, and more widely, the discipline of HFE. Additionally, a crucial avenue to grow interest in the research and practice of human factors and ergonomics globally is creating awareness of and interest in the IEA and its internal stakeholder events and activities for the public and external stakeholders.

To address these needs, the Communications and Public Relations Committee has been involved in several activities to communicate with stakeholders and create awareness of global events and publications while trying to better understand how to reach the Early Career Community.

6.3.1 The Communications Development Project

The communications activity requires collaboration across the different Standing Committees, the Vice President/Secretary-General, and the IEA administrator (as outlined in the diagram below). There have been several important elements to this development during the current triennial term, the two most significant of which are the IEA *NewsBriefs* and building up IEA's presence on social media.

Table 6.1 Stakeholders involved in the Communications Project

To / From	**Executive**	**Standing committees (STP, PSE, ID, FoW, IEA Secretariat Administrator)**	**IEA Technical Committees, Federated & Affiliated Societies**	**External stakeholders (cognate disciplines, the public, other societies and regulatory bodies, universities)**
Executive	Project oversight	Work with relevant stakeholders on program, event, or publication development to ensure relevance and scientific validity and reliability	Receive and filter requests from researchers and practitioners on HFE-related topics and opportunities Drive the development and sharing of content, publications, events, webinars, discussions, conferences, and the development of new programs	Requests to learn more about HFE research and practice. Global trends in the FoW and the need for HFE to be integrated Events related to HFE or of interest to HFE and IEA
CPR, *NewsBriefs* Editor, IEA Secretariat Administrator	Support the development of appropriate on-brand advertising, while supporting online	Promotes the dissemination of the latest science, practices, news, or opportunities globally	Oversight	Support with promotion and awareness raising.

[7] Section contributed mainly by Jonathan Davy, Chair of Communications and Public Relations

	registration or promotion via NB, Social media, or CC.			

To From	**Executive**	**Standing committees (STP, PSE, ID, FoW, IEA Secretariat Administrator)**	**IEA Technical Committees, Federated & Affiliated Societies**	**External stakeholders (cognate disciplines, the public, other societies and regulatory bodies, universities)**
IEA Networks/Societies/ Technical Committees	Through social media (LI, FB, Twitter, CC) disseminate news, events, webinars, and publications		Wide dissemination of material	S,T&P supports work of TCs
External stakeholders (cognate disciplines, the public, other societies and regulatory bodies, Universities)	Recipients and contributors to content, events and publications Share it with their networks			Meet the need to understand better the value add of high-quality HFE through events, publications and conferences

6.3.1.1 IEA NewsBriefs

Under the editorship, initially, of Erin Chiou from the United States and then, Nokubonga 'Sma' Ngcamu-Tukulula from South Africa, the *NewsBriefs*[8] has been a critical avenue through which to share updates with stakeholders, through sharing on social media, and through the Constant Contact direct-email subscription system. Over and above sharing event and publication notices, Sma introduced a spotlight feature on Federated Societies, which showcased the history, size, and current activities of IEA Member Societies across the globe. More recently, a similar slot has been created to showcase the activities of the various IEA Technical Committees. These should undoubtedly continue as regular elements of the *NewsBriefs*. The Chair of Communications and Public Relations wishes to extend his sincere gratitude to Erin and Sma for their outstanding contributions to the monthly preparation of the *NewsBriefs* and to Maggie Graf and the rest of the Officers for their insights and guidance leading up to each edition's publication.

6.3.1.2 Building up the Social Media Network

A second part of the Communications project focused on growing the IEA's presence on various social media platforms. These included:

- LinkedIn (https://www.linkedin.com/groups/1114517/),
- Twitter (now X) (https://x.com/IEA_Ergonomics?t=VijRcBPQCOPcFb-gIGVb7Q&s=03) and
- Facebook (https://www.facebook.com/InternationalErgonomicsAssociation).

The increased use of these platforms did result in an increased following on the respective platforms and facilitated important networking opportunities between the IEA and its internal stakeholders, such as Federated Societies and Technical Committees that also have active social media pages. The Chair of Communications and Public Relations extends his sincere appreciation, in particular, to Sadeem Qureshi and Katie Buckley for their support with this part of the project.

However, this aspect of the Communications activity has the potential for expansion in the following ways:

[8] See https://iea.cc/newsletter-signup/iea-newsbriefs-archive-of-past-issues/

- Either more frequent and diverse posts (with respect to the types of posts and the content) or fewer, high-quality and carefully designed posts should be considered.
- The committee should potentially include students, researchers, and professionals with some expertise to better leverage the potential of social media.
- Alternatively, budgeting for and integrating a professional in design and social media into the CPR committee may assist with further professionalizing the IEA's presence on social media.

Further enhancement of this part of the Communications activity will aid in improving the added value of being an IEA member, while addressing some of the barriers identified by the Early-Career Community around their interest in either remaining part of or joining the HFE discipline through their respective societies.

6.3.2 Early-Career Community

During the last three IEA Triennial Congresses, Katie Buckley and Sadeem Qureshi have, through several carefully designed interactions with students and early-career researchers and practitioners, begun to understand some of the barriers and opportunities to support this group (Early-Career Community) to pursue their careers in HFE. These were captured in a special-issue publication in the journal *WORK*: Qureshi, S. M., Davy, J., & Buckley, K. (2022). The barriers and opportunities to support the early career academics and professionals in human factors/ergonomics - revisiting reflections from IEA2015, IEA2018 & IEA2021. *WORK*, 73(s1), S67-S80 (https://content.iospress.com/articles/work/wor211216).

Over and above this, at the Council meeting in Santiago, Chile, in October last year, Nancy Black and Jonathan Davy ran a workshop with those societies present to understand their experiences of this. Some critical challenges around the recruitment and retaining of new members, including ECCs, included:

- Reduction in the number of faculties and departments working in the field of HFE and too few courses focused on HFE.
- Members not paying their annual fees, which makes it difficult for the society to invest in systems to improve the value add to the members.
- Societies being run by academics or practitioners on a volunteer basis, which often makes it challenging to balance the demands of the society with professional (and personal) commitments.
- Poor financial standing of many societies, which influences the work they can do to recruit and retain members.
- Poor awareness and understanding of what HFE is still and of the societies that are representing the disciplines in different countries.
- Lack of explicit programs within societies dedicated to identifying, recruiting, and retaining early-career members.

The Council suggested several strategies to address these challenges, specifically aimed at ECCs. These included:

- Increase opportunities to learn more about the discipline and the societies. This includes offering more online events, increasing social media presence, and hosting events to promote networking that existing and potential members can attend.
- Regarding students, early-career professionals and researchers, provide explicit opportunities/products that are geared towards recruiting and retaining them, including discounts; specifically tailored workshops, summer schools, and opportunities for ECR to share their research; connect students/researchers with

industry; create opportunities for awards and promotion of young professionals; create opportunities for industry to advertise job opportunities and/or mentorship of young professionals and students; increase lay publications to promote visibility of the organizations (e.g. CIEHF's *THINK* magazine); and provide discounted rates to conferences and specifically the IEA Triennial Congress.
- Continue to promote the discipline, the societies, the Technical Committees, and other relevant stakeholders globally through social media. This can be achieved by ongoing webinars, publications, and other events.
- Create a global network for early-career people worldwide, possibly theming this membership by sector, discipline, or research topic.

An important starting point is to initiate the creation of an Early-Career Community Technical Committee, which can, along with the other Technical Committees, drive the involvement of members of this group, while also driving some of the above-mentioned initiatives to increase the interest of the ECC group in HFE. No doubt, this will be a point of discussion at the next IEA Congress, where Katie Buckley will host a special session for this community. The IEA Executive is thankful for Dr Buckley's continued interest in driving these important discussions, which certainly deserve more attention in the future.

Another activity was started this year by the Early-Career Community working within the Healthcare Technical Committee. They found a sponsor for a prize and organized a series of five IEA webinars, each with 5-6 participants, who presented their work to compete for the prize. This is an outstanding initiative, and the IEA Executive is thankful to all who were involved.

6.4 Awards for outstanding work[9]

An important function of IEA is to grant formal recognition to members of Federated Societies who have made outstanding contributions to the field of ergonomics and human factors on an international level. The granting of awards supports several IEA objectives and strategic policies but principally the advancement of the science and practice of HFE at an international level.

Although all the awards are presented during the IEA Triennial Congresses, some are offered annually and others only during years of the Triennial Congress. The Awards Standing Committee manages the awards process.

The number of IEA Annual and Triennial Awards has steadily risen over the past decade, making the awards process more complex and increasing the time and effort required for diligent processing and monitoring of nominations. Some sponsors (e.g., Tsinghua University and Kingfar International) provide additional funds to support the evaluation process and this may be a requirement for future sponsors as well.

The awards process involves and serves many internal and external stakeholders.

Main benefits to stakeholders:
- Promotion of HFE across the globe
- Acknowledgment
- Prestige
- Monetary award (reward and investment in future)

[9] Major contributor for this section was Kathleen Mosier, Chair of the Awards Standing Committee and Immediate Past President.

- Benefit of society membership
- Advertisement/publicity for sponsors

Table 6.2. Main stakeholders for awards and their relationships to each other

From / To	EC and Awards Committee	Council	Member Societies	Sponsors	Reviewers including Fellows
EC and Awards Committee		EC gives information to Council	EC expects information to be disseminated to member societies	Work closely to monitor awards processes – nominations and selections	EC (Awards Chair and Co-Chair) selects reviewers.
Council	Council works with EC to advertise awards within societies and submit nominations		Council disseminates information to member societies	Council approves awards and sponsors	Reviewers may be recommended by Council members
Member Societies	Member Societies provide nominations; selections will be approved by EC	Member societies rely on Council members to provide information about awards in a timely fashion		Member societies encourage sponsors	Reviewers are usually from member societies
Sponsors	Sponsors work with EC to define awards. Officers and sponsors sign MOUs or contracts for awards	Sponsors may be solicited by Council Members.	Sponsors are often part of or found by member societies (e.g., CES and IEA/Tsinghua and IEA/Kingfar awards)		Sponsors are supporting reviewers with honoraria
Reviewers including Fellows	Reviewer selections are examined and approved by EC	Reviewers may be Council members	Reviewers are typically from member societies	Sponsors support reviews and may approve selections	

6.4.1 Triennial Awards 2024

The IEA/Elsevier John Wilson Award is presented in honor of John Wilson (1951-2013), Professor of Human Factors at the University of Nottingham, where he was Director of the Institute of Occupational Ergonomics until his departure and Head of the Human Factors Group (until 2006). Professor Wilson was the co-Editor-in-Chief of *Applied Ergonomics*, former president of the IEHF, and a long-term affiliate with IEA. The award recognizes major contributions in the field of applied ergonomics.

The 2024 IEA/Elsevier John Wilson Award recipient is

- Tarcisio A. Saurin, Federal University of Rio Grande do Sul, Brazil

IEA Triennial Outstanding Educators Award is presented triennially to persons in recognition of outstanding contributions in the area of human factors/ergonomics education for having developed ergonomics education programs, introduced new methodology and/or materials for teching human factors/ ergonomics, and/or graduated persons who have become outstanding human factors/ ergonomics researchers and practitioners.

The 2024 IEA Triennial Outstanding Educators Award recipient is

- Denny Yu, Purdue University, USA

IEA Award for Promotion of Ergonomics in Developing Countries is given triennially to an individual(s) who has made significant and outstanding contributions to the development of infrastructure of human factors/ergonomics in an industrially developing country. This may be manifested through development of teaching/training programs, implementation of HFE design in industry, development of R&D programs, organization of HFE professionals, or extensive collaboration with international bodies such as United Nations.

The 2024 IEA Award for Promotion of Ergonomics in Developing Countries recipient is

- Alireza Choobineh, School of Health, Shiraz University of Medical Sciences, Iran

The IEA President's Award is presented triennially to persons who have made outstanding contributions to ergonomics or the furthering of ergonomics, and whose contribution does not clearly fall into one of the other award categories.

The 2024 IEA President's Award recipient is

- Juan Carlos Velásquez, Universidad del Valle, Colombia

Prof. Velásquez was selected for his outstanding contribution to HFE education in Latin America. He was the driving force behind the creation and approval of the first ergonomics/human factors multi-college and multi-university PhD program in Colombia and Latin America, in collaboration with professors/universities from Europe, North America, Latin America, Africa, and Asia. The program is training the next generation of Latin American HFE scientists and practitioners and will select its third cohort in 2024.

IEA Ergonomics Development Award

- No nomination was received

IEA Distinguished Service Award

- No nomination was received

IEA Human Factors and Ergonomics Prize

- No nomination was received

Student Triennial Awards

The KU Smith Student Award was launched in 1997 through an agreement with the St. Paul Foundation, which provides overall management of the Fund. The award provides a tangible means by which the IEA can encourage the development of the discipline, foster scholarship, and recognize worthy achievements. The purpose of the award is to honor deserving students responsible for an application of or contribution to human factors/ergonomics. Awardees present their papers at a special session in the Triennial Congress.

The 2024 KU Smith Award recipients are

- Soomin Hyun, Seoul National University, South Korea
- Sameneh Norouzi, Tarbiat Modares University, Iran
- Kaitlyn L. Dallas, University of Illinois at Urbana-Champaign, USA

One new Triennial Award was introduced during this term – the **Thomas R. Waters MSD Memorial Scholarship Award**. Thomas R. Waters was a scientist at the National Institute of Occupational Health and Safety in the USA and was the mastermind behind the NIOSH Revised Equation for the Design and Evaluation of Manual Lifting Tasks. The Waters family established this scholarship, managed by the U.S. Center for Disease Control Foundation, to encourage the furthering of science in this area. It is a realization of the Waters family's wish to enable students and recent graduates to continue the research to help understand and control MSDs in the workplace. 2024 is the first presentation of this award.

The 2024 Thomas R. Waters MSD Memorial Scholarship Award awardee is

- Rahul Narasimhan, Clemson University, USA

6.4.2 Annual awards 2022-2024

The **IEA Fellow Award** recognizes extraordinary or sustained, superior accomplishments of an individual over the course of a career. To be considered for this award, the candidate must have been a long-term member in good standing of an IEA member society and must demonstrate outstanding contributions and service to the human factors/ergonomics community at an international level. The list below reflects the new IEA Fellows for this term.

2024 Fellows are:

- Caroline Cao, United States
- Chia-Fen (Christine) Chi, Taiwan
- Neri Dos Santos, Brazil
- Carlos Espejo, Mexico
- Francisco Fialho, Brazil
- Sean Gallagher, USA
- José Orlando Gomes, Brazil
- Eui S. Jung, Korea
- Annie Weill-Fassina, France
- Wei Zhang, China

2023 Fellows are:

- Paulina Hernandez Albrecht, Chile
- Max Anibal, Peru
- João Alberto Camarotto, Brazil
- Ken Catchpole, United Kingdom
- Helenice Jane Cote Gil Coury, Brazil
- Kermit Davis, USA
- Alma Marie Jennifer Gutierrez, Philippines
- Hongwei Hsiao, USA
- Karen Messing, France
- Marcelo Marcio Soares, Brazil

2022 Fellows are:

- Robert Fox, USA
- Margo Fraser, Canada
- Karen Jacobs, USA
- Ronald McLeod, United Kingdom
- Paulo Antonio Oliveira, Brazil
- Isabella Steffan, Italy
- Wei Xu, China

The **IEA/Tsinghua Award for Collaborative Human Factors/Ergonomics Education** honors persons (e.g. researchers, teachers) who, through international and/or inter-regional collaboration, have made significant and outstanding contributions to the success of postgraduate educational programs that include HFE courses or substantial HFE content in

the curriculum. Applications are evaluated by renowned international reviewers and we thank the selection committee chair, Prof. Mario Vidal, and his team for their excellent work.

2024 IEA/Tsinghua Awardee

- Alan HS Chan, China

2023 IEA/Tsinghua Awardees

- Fiona Trevelyan & Dr. Liz Ashby, New Zealand
- Pradip Kumar Ray & Dr. Denny Yu, India and USA
- Eduardo Ferro, Brazil
- Paulo Antonio Oliveira, Brazil

2022 IEA/Tsinghua Awardees

- Tarcisio Abreu Saurin, Brazil
- Ting Li, China
- Rauf Iqbal, India

The IEA/Kingfar Award for Research in Human Factors and Ergonomics Issues is given annually to honor students and early-career researchers who have high-quality human factors/ergonomics (HFE) research achievements. The purpose of the award is to significantly promote and reward high-quality original research and applications on new and emerging HFE issues or issues specifically related to industrially developing countries, as well as to promote a career path in HFE.

2024 IEA/Kingfar Student Awardees

- Ezekiel Bernardo, Philippines
- Lucas Gomes Miranda Bispo, Brazil
- Claudia Maria Dias Guerra, Brazil
- Mingming Li, China
- Italo Rodeghiero Neto, Brazil

2023 IEA/Kingfar Student Awardees

- Subhankar Banerjee, India
- Carlos Galindo, Peru
- Hiroyuki Kuraoka, Japan
- Yotam Sahar, Israel

2022 IEA/Kingfar Student Awardees

- Yidan Dong, China
- Jiawei Fu, China
- May Jorella Lazaro, South Korea
- Akram Sadat Jafari Roodbandi, Iran
- C. Vigneshkumar, India

2024 IEA/Kingfar Early Career Researcher Awardees

- Geetashree Bori, India
- Yaqin Cao, China
- Peng Liu, China

- Farzan Sasangohar, USA
- Mark Schall, USA

2023 IEA/Kingfar Early-Career Researcher Awardees

- Augustine Acquah, South Africa
- Julio Bispo, Brazil
- Jonathan Davy, South Africa
- Stephven Kolose, New Zealand
- Daniel Moura, Brazil

2022 IEA/Kingfar Early-Career Researcher Awardees

- Gabriela Garcia, Ecuador
- Carlos Aceves Gonzalez, Mexico
- Michael Greig, Canada
- Lakhwinder Pal Singh, India
- Tingru Zhang, China

7 IEA Networks

IEA's growing size has led to a revision of its membership structure, through the creation of IEA Networks. IEA Federated Societies may work together in networks when a need is felt to do so. Examples of such needs can be geographical proximity, sharing of a common language, or promotion of common interests. The IEA Council gives its agreement to the creation of a network based on a proposal from networked societies stating membership and goals. These networked societies are granted the status of IEA Network and report on their activities to IEA.

There are currently six IEA Networks:

1. Asian Council on Ergonomics and Design (ACED)
2. ErgoAfrica
3. Federation of Brazilian, Russian, Indian, Chinese, and South African Human Factors and Ergonomics Societies—BRICS+
4. Federation of European Ergonomics Societies – FEES
5. La Unión Latinoamericana de Ergonomía – ULAERGO
6. Southeast Asian Network of Ergonomics Societies – SEANES

Although no new networks were added during the triennial period, the networks were invited to all Council meetings and encouraged to report on their activities. Several participated actively and regularly reported. Resources seem to be a significant factor in attendance at meetings.

7.1 ACED

Elected 2023-2026

President: Frederick Tey, Human Factors & Ergonomics Society of Singapore (HFESS)
Vice-President: Chris Su, EST (Taiwan)
Treasurer: Edwin Yap, Human Factors & Ergonomics Society of Singapore (HFESS)
Secretary: Khang Chian Yong, Human Factors & Ergonomics Society of Singapore (HFESS)
Assistant Secretary: Manida Neubert, Ergonomics Society of Thailand (EST)

Recent & Upcoming Activities:

- The fourth ACED Triennial Conference ACED 2023 was held in Mumbai, India, simultaneously with the BRICS+ HFE conference 2023 and the HWWE 2023 conference of the Indian Society of Ergonomics. IEA representatives attended and supported these conferences.
- The application of the Bangladesh Ergonomics Society (BES) for membership in ACED was approved at ACED Council Meeting in December 2023.
- EST invited members of ACED to participate in EST 2024 at Taipei, Taiwan, 8th to 10th March 2024, Tatung University, Taipei, Taiwan
- ESK invited members of ACED to participate in IEA 2024 at Jeju Island, South Korea, 24th to 25th Aug 2024 (IEA Council Meeting), 26th to 29thAug 2024 (Triennial Congress) Venue: ICC JEJU, Jeju International Convention Center, Jeju Island, South Korea. ACED Council Meeting will be held on 25 August 2024 after IEA Council Meeting.
- 5th ACED Triennial Conference will be held in Singapore, 2026.

7.2 BRICS+

The BRICS Plus (BRICS+) network is a cooperative alliance between Brazil, Russia, India, China, and South Africa. The main activity organized during the triennial period was a combined congress with the 4th Asian Conference on Ergonomics and Design and the annual congress of the Indian Society for Ergonomics "Humanising Work and Work Environment." The theme of the combined conference was "Human-Centered Digitalisation." The conference attracted more than 350 delegates.

Keynote speeches were delivered by Mr. K. Ravi (TVS motors, India), Prof. José Orlando Gomes (President IEA), Prof. A. K. Ganguli (President ACED), Prof. Debkumar Chakrabarti (President ISE), Prof. Myung Hwan Yun (South Korea), Prof. Torizuka Takashi (Japan), Prof. Andrew Thatcher (South Africa), and Dr. Maggie Graf (virtual, recorded version), Dr. Velagapudi Praveen (India), Dr. Shin-ichi Fukuzumi (Japan), and Mr. Sitaram Kunte (India).

A selection of photos from the conference

A special session on Defence Ergonomics was conducted by the Defence Research and Development Organization (DRDO). Another special session was conducted by Ms. Swati Mehrishi, Springer NATURE for researchers and faculty members. The topic of the workshop was publishing papers in journals.

A total of 183 oral presentations including 40 lead lectures and 15 poster presentations were made in 4 parallel sessions during three days (14-16 Dec 2023).

7.3 ERGOAFRICA

President - E.N.D. Ekechukwu
Secretary–Jonathan Davy
Treasurer –Amira Omrane

Total number of HFE practitioners included in network: approximately 160.

Recent activities

- Regional Scientific Conference
- Collaboration in research
- PG Programme at the University of Ghana.
- ErgoAfrica joint scientific conference

Current issues

- Certification Programme for members
- Postgraduate Programme
- ErgoAfrica Journal

7.4 Federation of European Ergonomics Societies

President: Bernard Michez
Secretary-General: Aleksandar Zunjic
Treasurer: Pedro Ferreira

FEES collaborates closely with the European Agency for Safety and Health at Work (EU-OSHA), the International Social Security Association (ISSA), and the European Community Expert Group for the Machinery Directive.

Current activities

- Evolution of the European Machinery Directive - This Directive (2006/42/CE) is one of the most important Directives of the EU for our profession. It contains specific requirements based on ergonomic principles. FEES is included in the expert group. In the Executive Board of FEES, Pascal Etienne is particularly involved in this action.

- Industry 5.0 and Future of Work - The Industry 5.0 topic has been growing in Europe since 2022. The FEES Executive Board launched the construction of a white paper about it, relying on the multiple return of experience in our profession. This document is still under construction, and FEES aims to include partners in its creation. FEES organized several workshops about this topic.

- Creation of a standard presentation about HFE in projects, to be delivered in technical congresses. The exchanges with FEES members show that there is always a need for information on our profession towards other specialists and sponsors. The PowerPoint document was created, and shared with each member, so that everyone may adapt it to their own needs. It is designed to last about 15 minutes, and it contains pragmatic examples. It is necessary to identify technical congresses in each country, in order make presentations by national associations.

- Support to the EU-OSHA campaign, about digitalization. 5 topics :
    - Advanced robots and artificial intelligence
    - Worker management through artificial intelligence
    - Digital platform work
    - Smart digital systems
    - Remote work

- Constant relations with partners, such as ETUI (European Trade Union Institute), PTKA (Germany), Ergomach, EU-OSHA, and ISSA.
- Evolution of the FEES website, thanks to Gyula Szabo.
- Promotion of the TRAIN4WORK product, designed for non-specialists, available in 4 languages.
- Development of a NAB (National Assessment Board) in Spain, in cooperation with AEE and CREE, and creation of a master's degree in HFE. This action is ongoing, and the next 2024 FEES Council, organized in Gijon, will be an occasion for the progression of this process.

7.5 ULAERGO

President: Sandra Liliana Joaqui Galindo
Vice-President Secretary: Luz Ángela Téllez Chavarro
Vice-President Treasurer: Ángela Padrón

IEA strongly supported the XIII International Congress of Ergonomics and Human Factors of the Chilean Society of Ergonomics and Human Factors SOCHERGO and the VIII Congress of the Latin American Union of Ergonomics ULAERGO held in Chile, with presentations from IEA resource persons including the IEA President, Past President, and Chair of the Science, Technology and Practice Committee.

Administrative actions:

- Bogota chamber of commerce and ESAL's own and updating of the web page
- Support to RACE
- Launching of the campaign "You don't know who I am "
- Participation ASERFHU of Bolivia: Bolivian Catholic University UCB
- Alliances with ERGOYES and IBV
- Meetings Quiron prevention, UNIR
- Updating seminar days and usability workshop (event of the National Meeting of ULAERGO)
- Actions with higher-education institutions: Universidad Antonio José Camacho, Universidad del Valle, UNIMINUTO
- Proposal development: ARL SURA, ARL POSITIVA
- Updating strategies: talks
- Actions related to internal communications with IEA and ULAERGO
- Caribbean chapter event: Ergodesign, new technologies applied to ergonomics
- Antioquia chapter event: congreso semana de la salud ocupacional (occupational health congress week)
- Bogota chapter event: ergonomics management in the company and balance and movement in human factors (in alliance with corporate partner ECR)
- Participation in the mining commission
- Development of a programme on transparency and business ethics, training SARLAFT

7.6 SEANES

No report received.

8 Science, technology, and practice[10]

IEA promotes HFE science principally through the IEA Triennial Congresses, the Technical Committees, and by its publishing activities. During the current triennial period it has also produced about 40 webinars, which are available to all on the IEA YouTube channel. These aim, among other things, to provide resources from leading HFE experts for the use of educators and to assist members in keeping their HFE knowledge up to date. In addition to this, a project to advance HFE education in South America, Africa, and Southeast Asia has been ongoing throughout the triennial period.

Online meetings of the Science, Technology, and Practice Standing Committee (STP) took place bi-monthly. Meetings with the entire STP committee including chairs of the 26 Technical Committees (TCs) took place semi-annually. Two additional meetings of the entire group took place online with the IEA2024 organizers – Feb. 28 and May 31, 2024 – to coordinate the scientific program for the Triennial Congress.

8.1 Triennial Congress

8.1.1 Preparations for IEA2024

During the triennial period, preparations for IEA2024, which was held at the conclusion of the triennial period at the International Convention Centre on Jeju Island, Korea, were continuous. The Conference Chair, Myung Hwan Yoon, attended all Council and Executive Committee meetings, giving ongoing reports on the preparations and responding to questions. The Executive Committee meeting of Spring 2023 took place in Seoul and allowed the officers and directly involved EC members to visit the site and familiarize themselves with the infrastructure. Additionally, Yushi Fujita, former IEA President, was requested to assist with the communication between the IEA2024 Organizing Committee, who were all from Korea, and the IEA Executive members during the final 18 months. A separate IEA2024 Congress Report will be produced by the Congress Organizing Committee following the conference.

Members of IEA Executive visit Jeju and meet organisers in 2023

[10] The principal contributor to this chapter was Nancy Black, Chair of the Science, Technology, and Practice Standing Committee.

The Technical Committee (TC) chairs and co-chairs became actively involved in preparations for IEA2024 over the year preceding this event, encouraging submissions, proposing special sessions, and providing evaluation support of submissions. There were two special meetings with TC representatives and the IEA conference chair in the early months of 2024 to support efficient communication during that crucial period. The meetings were initiated by the Science, Technology, and Practice Standing Committee.

8.1.2 Support for future Congress Management Planning

Congress Model Guidelines
In 2018 a project was started by the then-President, Kathleen Mosier, to develop a document and templates for providing Triennial Congress organizers with a set of good-practice guidelines. This project, under the leadership of Elina Parviainen, Chair of Development and Promotion, continued during this term and the result made available to all Council members in early 2024. This work is described in detail in Section 11.1.

Hybrid Content
The Technical Program co-chairs of IEA2021 compiled the key learning points associated with their hybrid and virtual congress presentation experiences. In this area, two documents were produced:

- Nancy Black and Patrick Neumann created a document for internal use by IEA. "Hybrid and Virtual Elements of an IEA Triennial Congress" (4 pages, including 10 points). This document was made available to the organizers of IEA2024 to pass on the lessons learned and it has also been included into the Congress Model under development during the executive term (see Section 11.1).
- For the wider scientific community, a further article was prepared and published: Black, N.L., Neumann, W.P., Noy, I., Dewis, C. (2023) Applying ergonomics and human factors to congress organization in uncertain times[11].

8.2 Endorsements of other scientific events:

IEA endorsement of events provides the organizers with international advertising. IEA lists the endorsed events on the IEA website, includes them in the IEA *NewsBriefs*, which goes to around 2000 subscribers, and generates social media content on the IEA Facebook, LinkedIn and X platforms. Additionally, the event can use a special IEA logo to indicate that it is an IEA-endorsed event on the event website. The endorsement fee (200 USD) assists the IEA to pay for the infrastructure for these platforms. IEA will list events that are not officially endorsed on the IEA website without cost, but the endorsement approval process is designed primarily to ensure the quality of advertised products.

The Science, Technology, and Practice Standing Committee recognized early in their term that a clarification of the communication and streamlining of the IEA endorsement process was required. The proposed changes to the IEA *Operating Procedure* "IEA Endorsed Events" were accepted by Council in 2022

To assist the Federated Societies during the period affected by Covid-19 closures, the endorsement fee was waived. Technical Committee organized events continue to be exempt from the fee. Since IEA2021, endorsements included 3 in 2021, 6 in 2022, and 7 in 2023.

[11] *Applied Ergonomics*, Vol. 106, 103862 (13 pages), DOI: 10.1016/j.apergo.2022.103862

Further considerations: An increased effort should be made to measure the value of IEA endorsement by cataloguing key aspects of each event (organizer, dates, location, online (yes/no), event title, applicant, attendance numbers).

Table 8.1 Endorsed events

2021 Endorsed Events			
Organizer	**Dates**	**Location**	**Event**
ADEA (Asociation de ErgonomÍa Argentina)	Nov. 26	Rosario Santa Fé, Argentina	3rd National Ergonomics Conference
Society of Ergonomics Science of Ecuador	Dec. 9-10	Loja-Ecuador	III Jornadas Internacionales de Ergonomía Loja Ecuador
Human Factors and Ergonomics Society	Oct. Live 4-7; virtual 25-28	Baltimore MD	HFES 65th International Annual Meeting

2022 Endorsed Events				
Organizer	**Dates**	**Location**	**Event**	**Attendance**
IEEE ARSO 2022 Organizing Committee	28 -30 May	USA	2022 IEEE International Conference on Advanced Robotics and its Social Impacts (ARSO)	
Slips, Trips, and Falls Technical Committee	July 22-23	Sendai Japan + online	14th International Conference on Slips, Trips, and Falls	33 on-site + 51 virtual; from 11 countries.
International Federation of Automatic Controls (IFAC), Technical Committee Human Machine Systems 4.5	Sept. 12-15		15th Symposium on Analysis, Design, and Evaluation of Human Machine Systems	
EHSS (Swedish Ergonomics and Human Factors Society) + Uppsala University	Oct. 23-25	Uppsala, Sweden	51st NES Conference NES2022 Work Well – Ergonomics in an unpredictable world	
Delft University of Technology, Faculty of Industrial Design Engineering	Nov. 2-4	Delft	7th Triennial International Conference on Healthcare Systems Ergonomics and Patient Safety.	
Croatian Ergonomics Society.	Dec. 7-10	Zagreb Croatia	9th International Ergonomics Conference - Ergonomics 2022	46 on-site; 19 online

2023 Endorsed events			
Organizer	**Dates**		**Event**
Slips, Trips, and Falls Technical Committee	June 1-2	Toronto, Canada	15th International Conference on Slips, Trips, and Falls
IEEE ARSO 2023 Organizing Committee	June 5-7,	Berlin, Germany	19th IEEE International Conference on Advanced Robotics and its Social Impacts (ARSO 2023)
Organizational Design and Management Technical Committee	July 11-13	Bordeaux, France	14th ODAM conference 2023
Human Factors and Ergonomics Society of Malaysia	Aug. 13-18	Langkawi Malaysia	5th HFESM Biennial Conference on Human Factors and Ergonomics
Digital Human Modelling and Simulation Technical Committee	Sept. 7-9	Antwerp, Belgium	8th International Digital Human Modelling Symposium (DHM2023) and Summer School in DHM & Simulation (4-6 September)
Musculoskeletal Disorders Technical Committee / ICOH	Sept. 20-26	Bengaluru, India + online	PREMUS 2023: 11th PREMUS & 6th WDPI International Scientific Conference (Prevention of Work-Related Musculoskeletal Disorders, and Work, Disability, Prevention and Integration

2024 Endorsed events (up to July 2024)			
Organizer	**Dates**		**Event**
Human Factors and Ergonomics Society	Sept. 9-13	Phoenix, AZ, USA	HFES ASPIRE, the International Annual Meeting
DHM 2024 Summer School	Sept. 23-25	Antwerp, Belgium	Digital Human Modelling Summer School
Indian Society of Ergonomics	Dec. 13-15	University of Calcutta, Kolkata	HWWE 2024 (Ergonomics for Everyone: Future challenges in Health, Safety, and Design)
In progress of evaluation:			
Federal University of Rio Grande do Sul (UFRGS), Brazil	Oct. 23-24, 2025	Gramado, Brazil	Joint Biennial 11th Symposium of the Resilience Engineering Association and 14th Annual Resilient Health Care Society Meeting

8.3 Technical Committees

IEA Technical Committees (TCs) are ad hoc groups that are formed as a platform to discuss and exchange up-to-date information on a particular ergonomics and human factors field. They are the core IEA activities to promote the exchange of science scientific committee. In terms of governance, they are considered subcommittees to the Science, Technology, and Practice Standing Committee but they elect their own Chairs (subject to approval by the Chair of Science, Technology and Practice). Scientific queries

directed to the IEA are passed to the appropriate TC.

Many TCs organize their own regular congresses and provide information on useful tools and publications in their area, which may be published on the IEA website, and they offer webinars.

Any member of the IEA community can become a member of one or more Technical Committees. It is only necessary to contact the appropriate Chair. A list is available on the IEA website.

As of August 2024, IEA has 26 TCs:

1. Activity Theories for Work Analysis and Design
2. Aerospace HFE
3. Affective Design
4. Aging
5. Agriculture
6. Anthropometry
7. Building and Construction
8. Digital Human Modelling and Simulation
9. Ergonomic Work Analysis and Training (EWAT)
10. Ergonomics and Human Factors for Sustainability
11. Ergonomics for Children and Educational Environments
12. Ergonomics in Design for All (EinDfA)
13. Ergonomics in Manufacturing
14. Gender and Work
15. Healthcare Ergonomics
16. Human Factors in Robotics
17. Informal Work
18. Mining
19. Musculoskeletal Disorders (MSDs)
20. Organizational Design and Management (ODAM)
21. Resilience Engineering
22. Safety and Health
23. Slips, Trips, and Falls
24. Transport Ergonomics and Human Factors (TEHF)
25. Visual Ergonomics
26. Work with Computing Systems (WWCS)

Table 8.2 Technical Committee (TC) chairs and co-chairs

Name	Country	IEA TC Name	TC role
Francisco Moura Duarte	Brazil	Activity Theories for Work Analysis and Design	Chair ≤ 2024
Pascal Béguin	France		Chair ≤ 2024
Leila Boudra	France		Co-chair ≥ 2024
Raoni Rocha	Brazil		Co-chair ≥ 2024
Guy André Boy	France	Aerospace HFE	Chair
Rosemary Seva	Philippines	Affective Design	Chair
Takashi Toriizuka	Japan		Vice-chair
Jodi Oakman	Australia	Aging and work	Chair
Peter Lundqvist	Sweden	Agriculture	Co-chair
Karen Bredenkamp	USA	Anthropometry	Co-chair
Sandra Almeny	Spain		Co-chair
Y.G. Ng	Malaysia	Building and Construction	Vice-chair
John Smallwood	South Africa		Chair

Name	Country	IEA TC Name	TC role
Gregor Harih	Slovenia	Digital Human Modelling	Vice-chair
Sofia Scataglini	Belgium		Chair
Lawrence J. Schulz	USA	Ergonomics for Children and Educational Environments	Co-chair
Sarbjit Singh	India		Co-chair
Joel Cort	Canada	Ergonomics In Manufacturing	Chair ≥ 01/2023-08/2024
Kim Munroe	USA		Co-chair
Richard Gardner	USA		Chair ≤ 12/2022
Catherine Delgoulet	France	Ergonomics Work Analysis and Training (EWAT)	Co-chair
Marta Santos	Portugal		Co-chair
Erminia Attaianese	Italy	Ergonomics in Design for All	Chair
Isabella Steffan	Italy		Past chair
Marie Laberge	Canada	Gender and Work	Chair
Melissa Baysari	Australia	Healthcare Ergonomics	Chair to 8/2022
Kenneth Catchpole	USA/UK		Chair from 9/2022
Gabriel Garcia-Acosta	Colombia	Ergonomics and Human Factors for Sustainability	Co-chair
Ivan Bolis	Brazil		Co-chair
Karen Lange Morales	Colombia		Co-chair
Tiago Sigahi	Brazil		Co-chair
Patricia H. Rosen	Germany	Human Factors in Robotics	Alternate
Sascha Wischniewski	Germany		Chair
Bernard Martin	USA	Informal Work	Instigating chair 2023
Clive D'Souza	USA		Acting chair from 2024
Augustine Appah Acquah	Ghana		Co-chair Africa
Muhammad Muzzamil	India		Co-chair Asia
Yadira Gordón	Ecuador		Co-chair South America
Robin Burgess-Limerick	Australia	Mining	Chair
Erwin Spekle	Netherlands	Musculoskeletal Disorders	Co-chair (comm)
Steven Fischer	Canada		Chair
Christine Ipsen	Denmark	Organizational Design and Management (ODAM)	Co-chair
Michelle Robertson	USA		Chair
Alessandro Jatobá	Brazil	Resilience Engineering	Co-chair
Paulo Victor Carvalho	Brazil		Co-chair
Riccardo Patriarca	Italy		Co-chair
Robyn Clay-Williams	Australia		Co-chair
Tarcisio Abreu Saurin	Brazil		Chair
Tor Olav Grotan	Norway		Co-chair
Gyula Szabó	Hungary	Safety and Health	Chair
Maria Elena Boatca	Romania		Secretary
Takeshi Yamaguchi	Japan	Slips Trips, and Falls	Co-chair
Yue (Sophia) Li	Canada		Co-chair
Klaus Bengler	Germany	Transport Ergonomics and Human Factors (TEHF)	Vice-chair
Peter Burns	Canada		Chair
Marino Menozzi	Switzerland	Visual Ergonomics	Chair
Flore Barcellini	France	Work with Computing Systems	Chair
Stephane Safin	France		Co-chair

8.3.1 Improving contact and reporting

TC Chair handbook

The Science, Technology, and Practice (STP) Committee recognized that the *TC Chair Handbook* had last been revised in 2014. In 2022 this document was reviewed and revised under the direction of Rosemary Seva. The new document is available on the IEA Slack channel and has been shared with all current and incoming TC chairs and co-chairs. It includes suggestions relating to TC management, including elections and requirements for

TC establishment and maintenance. There was consideration of preparing an audio-visual support presentation, but based on TC chair feedback no further orientation resources are currently required.

TC meeting and reporting

To foster efficient, timely exchange of scientific and technical information at the international level between IEA Triennial Congress events, and in recognition of the value-added activities of TCs for the global community, the IEA STP Standing Committee endeavored to establish a regular reporting and meeting schedule. This was formalized into a project with the P^{2}DT process.

Project outline:

- Create regular periodic information exchange with STP Standing Committee and TC Chairs / Co-chairs

Process:

- STP hosts semi-annual 75-minute videoconference using the IEA Zoom account (approximate start time 12:30 UTC to include as many as possible around the world)
- General agenda:
  - STP chair and co-chairs give updates
  - TC chairs share updates, concerns, questions, and best practices

Table 8.3 Stakeholder roles and responsibilities

Stakeholder Group	What is the stakeholder group's role within the Project?	System role	Level
STP Executive	• Meeting organizer, chair • Plan meeting agenda, contents • Present IEA and Executive activities supporting TCs • Post meeting minutes and recording on Slack STP-TC channel	System actors/ Experts; global	Global
TC Chairs / Co-chairs	• Prepare semi-annual report of activities • Attend: learn and share concerns, questions, suggestions • Follow up from meetings (listen to recordings; ask for IEA support efficiently)	System actors	Global
IEA Secretariat	• Ensure meeting timing and date is available; record date • Define and share Zoom link • Share recording for posting	System actors	Global
CPR Committee	• Share key updates to global community (social media, *NewsBriefs*)	System actors / influencers	Global
Member societies	• Encourage members' participation in TCs • Approve (written) & Support TC events (publicity) when in their country / region	System influencer	National

Stakeholder Group	What is individual's role within the Project?	System role	Level
STP Executive	• STP chair: Nancy Black – Announce meeting; send invitations; oversee handbook publication; Share relevant news from IEA Executive Committee, provide TC event support (endorsement) • STP TC co-chair: Rosemary Seva: revise handbook, provide webinar support • STP Publications co-chair: Karen Lange Morales	Actor, experts, decision-makers	Global
TC Chairs / co-chairs	• Receive information from STP executive • Share information from their TC (events, concerns, questions), orally • Send written semi-annual report	Influencer, expert and actor	Global
IEA Secretariat	• Secretariat: Aleksandra Gamper – reserve Zoom link; ensure one of Secretariat, VPSG, or STP co-chair (Rosemary Seva) available to manage • Meeting IEA chair: Ensure recording made • Share recording with STP Chair	Influencer, expert and actor	Global
CPR Committee	• CRP chair - Jonathan Davy receive information for distribution • Sma (*NewsBriefs*) – incorporate and distribute news monthly	Actor, influencer, expert	Global
Member societies	• Member society presidents (on IEA distribution list) distribute news to their membership • Receive TC event proposals and provide written endorsement prior to submission to IEA STP.	Influencers	National

Table 8.4 Relationships between stakeholders

From / To	STP Executive	TC Chairs / Co-chairs	IEA Secretariat	CPR Committee	Member societies
STP Executive	Meet bi-monthly	Invite to meeting Request reports Provide support requested	Request Zoom link & recording support	Requestion publication of TC events, activities	
TC Chairs / co-chairs	Reports Questions, Suggestions, Recommendations	Meet as needed (semi-annually); Within TC at least semi-annually			Request support for Event
IEA secretariat	Supply Zoom link Supply Recording link		Ensure one of VPSG, Secretariat or STP TC-co-chair attending meeting; start recording		

From To	STP Executive	TC Chairs / Co-chairs	IEA Secretariat	CPR Committee	Member societies
CPR Committee	Advise received news; when published	Advise received news; when published		Communicate contents amongst members	Contents in *NewsBriefs*
Member societies	Share event endorsement requests	Respond to TC event endorsement support request			

Results to date:

- 2021: December 7 -9 (held two times to accommodate different time zones; first meeting 17 attended including 14 TCs; second time much less well attended)
- 2022: June 1; December 1, (one time each)
- 2023: June; December 11 (12 TCs; 10 reports)
- 2024: to support IEA2024-related communications – February 2 and May 31 (TCs and IEA2024 organizers)

TC Meeting benefits

The STP Committee has noted greater dynamism within TCs and based on TC chair feedback, collected from a survey distributed to the 26 TCs in March 2024, the results have been very positive. (In July 2024 results from 24 people representing 20 TCs had been received.) The 75-minute meeting format is appropriate, and this gives the STP Committee opportunities to ensure that up-to-date information is published for the wider community. In addition, the potential benefits include:

- Greater dynamism within TCs
  - Inspire via hearing other TCs' successes and activities
  - Ensure understanding of TC chair responsibilities
  - Share TC description, report templates
  - Explicitly support TC webinars
- More collaboration across TCs
  - Have multiple TC chairs present at once
- More efficient communication to TCs from IEA STP+ and vice-versa
  - Easier for IEA to support its TCs
  - Support IEA Triennial Congress communication to TCs
- Maintain TC contents up to date on iea.cc website
  - Post semi-annual written reports submitted after each meeting
- Facilitate data collection for summary reports (CPR, triennial report)

Strategies for the future:

Operationalize feedback

- TC concern about limited value from webinar efforts
  → discussion at Executive Committee: Collect and distribute attendance records
  → Continuing competency credit hour possibility via post-webinar questionnaires
- Passive TC
  → discussion during meetings – exchange of other TC recruitment successes

Based on the TC survey (published in Forms) in spring 2024

- Positive response to semi-annual meetings

- TCs want still more interaction and more frequent communication from STP executive
- On-boarding for new TC chairs should be improved
- Strategic concern: How best to support TCs with limited TC resources
- Maintain a record of active TCs; be aware of inactive TCs
  →Responses to meeting requests; Written reports received
  →When inactive – STP Committee can reach out to support

8.4 Publications

IEA regularly publishes documents with the goal of disseminating knowledge about HFE to various stakeholder groups. They support all of IEA's objectives. IEA leadership over the recent triennial terms has directed efforts to improving the understanding of HFE by potential external user groups. This need has been identified and supported by the federated society representatives.

8.4.1 Support for special-issue production in scientific journals

Following IEA2021, it was decided that guidance of TCs to facilitate proposing and publishing special issues in scientific journals may be warranted. Experience was gained during the publication of a special issue of *Work* (2022[12]), based on exceptional presentations from IEA2021. Twenty-two scientific papers and an editorial were included. Guest editorial team: Kathleen Mosier, José Orlando Gomes, Thomas Alexander, Sara Albolino, and Nancy Black.
Process:

- Call was announced in May 2021.
- Evaluation of submissions continued until April 2022.
- Double-blind reviewing with author revisions (required significant time).
- Publication was finalized in October 2022.

Furthermore, other special issues were created following IEA2021 related to particular technical committee contents and managed by these:

- *Human Factors: The Journal of the Human Factors and Ergonomics Society;* IEA2021 Special Issue on Human-Systems Integration in Healthcare; Guest editors: Yuval Bitan and Farzan Sasangohar; Volume 66, issue 3 (8 articles + editorial)
- *IISE Transactions on Occupational Ergonomics and Human Factors (TOEHF);*
  - *Practitioner Case Studies*; Special-issue editors: Ruurd Pikaar & David C. Caple; Volume 9, 2021 - Issue 2 (5 articles + editorial)
  - *"Digital Human Modelling in Ergonomics 4.0*; Special-issue editors: Gunther Paul, James Yang, Xuguang Wang; Volume 9, 2021 - Issue 3-4 (10 articles + editorial)
- *International Journal of Production Research;* Human-centric production & logistics systems design and management: Transitioning from Industry 4.0 to 5.0.; Guest editors: Eric H. Grosse, Fabio Sgarbossa, Cecilia Berlin, and W. Patrick Neumann; Volume 61, 2023 - Issue 22 (10 articles + editorial)
- *Ergonomics*; Gender and Work in Ergonomics: Recent Trends; edited by the IEA Gender & Work TC (Marie Laberge, Mélanie Lefrançois, Martin Chadoin, Isabelle

[12] Vol. 73 S1, DOI:10.3233/WOR-223646

Probst, Jessica Riel, Christelle Casse, Karen Messing); Volume 65, 2022 - Issue 11 (10 articles + editorial)

In advance of IEA2024, Technical Committees have been encouraged to produce special issues to capture key aspects of the presentations at the 2024 Triennial Congress. The organizers of IEA2024 are in communication with various publishers to produce special issues out of the Congress contributions. The editor in chief and/or board members of these journals will review and select manuscripts for publication. Authors will receive notification from the editorial board members if their full paper is selected for publication.

Special Issues List:
Applied Ergonomics
Journal of Engineering Design
Ergonomics "Future of Work"
Human Factors
International Journal of Industrial Ergonomics (two volumes)
International Journal of Industrial Engineering
European Journal of Industrial Engineering
WORK: A Journal of Prevention, Assessment & Rehabilitation

8.4.2 IEA Press Publications

A major initiative in 2021 was to pursue the goal of communicating relevant information to the *right people* in the *right fashion* at the *right time* (now). This initiative recognized the need to complement and synthesize information available elsewhere in an appropriate format for specific stakeholder groups. Two publications were supported by the Publications co-chair of the Science, Technology, and Practice Standing Committee, Karen Lange Morales:

- **The "Ergonomics in a Nutshell" series**, which includes publications planned for:
    - **Corporate-suite leaders**: Entitled "Giving your business the human factors edge,"[13] This publication initiative was led by a steering committee: Andrew Thatcher, Rosemary Seva, Nichola Adams, Kirsty Angerer, and Noorzaman Rashid. The publication design was created by Connect Communications with the support of the IEA Federated Society Chartered Institute of Ergonomics and Human Factors, United Kingdom. It included:
        - An accompanying Infographic and 1-minute summary video[14]
        - Marketing initiatives undertaken with presentations citing this document at national and regional conferences and gatherings (e.g., Association of Canadian Ergonomists Virtual Conference, 2022, keynote by Nancy Black; WorkSafe BC's *Ergonomics Month webinar for MSI prevention* on October 24, 2023).
    - **Project /operational managers**: Entitled "Giving your business the human factors edge … Making it HAPPEN!" Publication by IEA Press publications, August 2024, ISBN: 978-0-9976041-2-2; 61 pp.
        - Authors: Karen Lange-Morales, David Caple, and Andrew S. Imada
    - **Labor/union/worker organizations**: Title and content to be defined (anticipated publication date 2025).

[13] IEA Press publications with support of Chartered Institute of Ergonomics and Human Factors (CIEHF), August 2022. ISBN: 978-0-9796435-8-3; 19 pp
[14] https://ergonomics.org.uk/resource/giving-your-business-the-human-factors-edge.html

        - Publication lead: Allison Angold-Stephens of Canada (confirmed in July 2024).
- **Ergonomics Quality in Design (EQUID) 4.0** – updates to previous EQUID publications. This publication series supports the idea that HFE quality in the design process depends on a higher level; that is, the organization itself, and argues that HFE should always include not just the social but also the environmental dimension of sustainability. The aim was to continue to promote the design of sustainability-oriented products by publishing information about
    - Theory (2023)[15]
    - Illustrative example-focus (2024+)

In all cases, the publication projects followed the following steps:

Project outline:

- Define publication lead(s). Define leadership team (representative of the world, experts)
- Develop content
- Verify content (reviewers)
- Format presentation – document + supports / consistency with IEA image (for *Nutshell* publications)
- Publicize (create dynamic communication elements to complement)

Table 8.5 Ergonomics in a Nutshell Stakeholders matrix

Stakeholder Group	What is the stakeholder group's role within the Project?	System role
STP Executive	• Project oversight – bi-monthly meetings • Leader co-chair publications, Karen Lange Morales • Provide presentations to stakeholder groups	System actors/ Experts
Authors	• Propose content	Experts
Reviewers	• Review content • Suggest revisions	influencers
CIEHF	• Assistance in marketing – 1 minute recording; • Page layout	Experts
IEA Council	• For dissemination within their societies and networks • CIEHF partner for marketing	Influencers / Experts
IEA Executive	• ISBN numbers; Official publication information	
Member Societies	• For discussion, dissemination within their societies and networks	System actors
Users	• Read, apply • To encourage IEA and Member society consultation for other resources, certified professionals and member experts	System actors

[15] Lange-Morales, K., García-Acosta, G., & Bruder, R. (2023). Conceptual framework for the design and development of sustainability-oriented products: toward EQUID 4.0. *Theoretical Issues in Ergonomics Science*, 1–27. https://doi.org/10.1080/1463922X.2023.2292614 Open access.

Table 8. 5 Ergonomics in a Nutshell Individuals matrix (continued)

Stakeholder Group	What is the stakeholder individual's role within the project?	System role	
STP Executive	• STP chair, other co-chair: Project oversight – bi-monthly meetings; feedback as requested • STP co-chair publications = LEAD; Karen Lange Morales • STP chair & publications co-chair: Present to stakeholder groups	System actors/ Experts	Global
Authors	• Corporate management (C-suite): A. Thatcher ++++ • Project managers: Karen Lange Morales, David Caple, Andre Imada	Actors / Experts	Global
Reviewers	• (Upon request) review content; suggest revisions	influencers	Global
CIEHF	• Assistance in marketing – 1-minute recording; • Page layout	Experts	National
IEA Council	• For dissemination within their societies and networks • CIEHF partner for marketing	Influencers / Experts	Global
IEA Executive	• ISBN numbers; official publication information		Global
Member Societies	• For discussion, dissemination within their societies and networks	System actors	National
Users	• TBD; Read, apply • Use to reach more IEA and Member society resources, certified professionals, and member experts	System actors (users)	Local

Table 8.6 Relationships between stakeholders

From / To	STP Executive	Authors / Reviewers	CIEHF	IEA Council	IEA Executive	Member Societies	Users
STP Executive	Meet bi-monthly	Only via STP publications co-chair	Request assistance for marketing	Annual update	Semi-annual update		
Authors / Reviewers	Suggested, recommend-ations	Approximately 1 year work, sharing regularly	C-suite document through A. Thatcher lead				
CIEHF	Offer assistance for marketing						
IEA Council	Suggest authors, reviewers						Distribute

From To	STP Executive	Authors / Reviewers	CIEHF	IEA Council	IEA Executive	Member Societies	Users
IEA Executive	Provide ISBN, space on IEA.cc website as publication official support						Distribute
Member Societies							
Users						Feedback other needs	Encourage readers / users

Outcomes so far:

- Publication of 22 scientific papers from IEA2021 in Special Issue of Journal *WORK*
- Two documents published by IEA Press
  "Giving your business the human factors edge," IEA & CIEHF, 2022
  "Giving your business the human factors edge… Making it Happen," 2024
- Research article "Conceptual framework for the design and development of sustainability-oriented products: toward EQUID 4.0"

Future activities

Scientific Publications from IEA2024

Ergonomics in a Nutshell series

- Publicize project manager documents, create marketing supports
- IEA2024 special session and chapter in proceedings: *IEA "Ergonomics in a nutshell" Publications: Communicating directly to key stakeholder groups*
- **Create** labor-focused document, assign ISBN, create marketing supports, publicize

8.5 IEA Webinars

During 2020 the IEA Executive decided to try producing webinars containing examples of high-quality HFE that are freely available to members of all Federated and Affiliated Societies. The idea was that this serves to harmonize the understanding of what HFE is and can also serve to increase public knowledge of the field. Additionally, the webinars would be a resource for HFE educators. The current Executive team decided to continue the practice, as the trial had only just commenced when they started their term of office.

Several IEA TCs were involved in producing webinars, notably the MSD TC, Affective Design TC, Gender and Work TC, Informal Work TC, and the Early-Career Section of the Healthcare Ergonomics TC. Our thanks to all who contributed, especially for allowing their expertise to be shared with all who are interested via the recordings, which are saved on the IEA YouTube channel (International Ergonomics Association).

Needs:

- Advance science, technology, and practice involving expert content from around the world, accessible anytime

Project outline:

- Support webinars (60 – 90 minutes) through content creation that would be publicized and hosted on IEA platforms and made available through IEA channels

Process. In 2021, Webinar idea shared with IEA STP:

- IEA TC co-chair also organizer of webinars.
- Goal: 4 TC-content webinars annually
- Share *Procedure document* for organizer of individual webinars

Table 8.7 Stakeholder group roles

Stakeholder Group	What is the stakeholder group's role within the Project?	System role	Level
Webinar organizer	• Define webinar topic, speakers • Determine approximate desired date, time • Host during the webinar itself (introduce speakers) • Prepare poster announcements and share with STP TC-co-chair (webinar coordinator)	Actors / Experts / Decision makers	Global
Webinar presenter	• Define webinar content • Supply brief personal biography, photo, and description of content • Present webinar content; respond to questions during webinar • Suggest contents for post-webinar questionnaire	Experts, Actors	Individual
STP TC-co-chair	• Encourage TC webinar presentations • Maintain IEA webinar calendar (ensure dates, times do not conflict) • Share webinar announcement with CPR committee	Actors / Influencers / Decision makers	Global
TC Chairs / co-chairs	• Act as webinar organizers	Actors / Influencers / Decision makers	Global
IEA Secretariat	• Receive webinar request • Reserve Zoom link; record webinar • Prepare certificate of thanks for each speaker with IEA president signature; distribute	Actors	Global
CPR Committee	• Share webinar announcements via (social media, *NewsBriefs*)	Actors / Influencers	Global
Member societies	• Encourage members' participation at webinar	influencer	National
Webinar organizer	• TC chair / co-chair • STP Publications co-chair: Karen Lange Morales	Actor, experts, decision-makers	Global
Webinar presenter	• Receive information from STP executive • Share information from their TC (events, concerns, questions), orally • Send written semi-annual report	Influencer, expert and actor	Global

Stakeholder Group	What is the stakeholder group's role within the Project?	System role	Level
STP TC-co-chair	• STP TC co-chair: Rosemary Seva: revise handbook, provide webinar support • Share recording with STP Chair	Influencer, expert and actor	Global
TC Chairs / co-chairs	• CRP chair - Jonathan Davy receives information for distribution • Sma Ngcamu-Tukulula (*NewsBriefs*) – incorporate and distribute news monthly	Actor, influencer, expert	Global
IEA secretariat	• Secretariat: Aleksandra Gamper – reserve Zoom link; ensure one of secretariat, VPSG or STP co-chair (Rosemary Seva) available to attend • Ensure recording made • Post webinar recording in appropriate YouTube	Influencers	Global
CPR Committee	• CPR Chair – Jonathan Davy - Receive webinar proposals; distribute via social media channels • Sma Ngcamu-Tukulula– include in *NewsBriefs*	Actor	Global
Member societies	• President (person receiving *NewsBriefs*); distribute to membership	Actor / Influencer	National

Table 8.8 Relationships between stakeholders

From / To	Webinar organizer	Webinar presenter	STP TC-Co-chair	TC Chairs / Co-chairs	IEA Secretariat	CPR Committee	Member societies	Attendees
Webinar organizer	Discuss, define		Request Zoom link & recording support				(optional) Advise, suggest marketing	Welcome during session
Webinar presenter	Send biography, photo, content description	Meet in advance; ensure contents coherent	-					Present & respond
STP TC-co-chair	Supply Recording link		Record in calendar					
TC Chairs / co-chairs								
IEA Secretariat		Certificate of thanks	Supply Zoom link					

From To	Webinar organizer	Webinar presenter	STP TC-co-chair	TC Chairs /Co-chairs	IEA Cecretariat	CPR Committee	Member societies	Attendees
CPR Committee	Advise received; when published		Advise received; when published			Share contents for publica-tion	*NewsBriefs* sent	
Member societies								Suggest attend
Attendees		Ask questions			Respond to post-webinar question-naire (option)			Learn from questions, remarks

Potential benefits:

- Encourage scientific advancement
- Encourage networking
    - Speakers, organizers, attendees, IEA Secretariat Administrators (future involvement)
- Maintain professional practice hours (attendees)
- Add value to iea.cc website contents
    - Increase traffic to IEA
- Facilitate data collection for summary reports
    - Zoom attendance
    - YouTube attendance

Results to date:

As of August 2024, IEA had produced more than 40 webinars since 2021.

- Attendance is possible live and via uploaded content in the IEA YouTube channel
- Average attendance (live and recorded) = 203 (max. 961)
- Content available: Guide to Running IEA webinars. Internal IEA document produced by Maggie Graf, Vice-President/Secretary General. March 22, 2022 (on Slack since April 21, 2022, in STP-TC channel)
- Presentation to TC meeting December 11, 2023, Slide 4: Webinar timeline documents, Rosemary Seva
- IEA Webinars in YouTube website channel[16]
- IEA2024 Special session accepted: *EC session: IEA webinars: Learning and sharing resources & opportunities*, presenters Rosemary Seva, Nancy Black, and Maggie Graf

[16] https://www.youtube.com/channel/UCDnjCjRcYB7rBR2PJFw6k6w

Strategies to develop

- Ask for feedback (Zoom survey) started in spring 2024
- Although some TCs have been very active in producing webinars (e.g., *MSD*), other TCs should be encouraged to create content as well.
- In 2024 at the request of the STP Committee a trial was conducted of a system to provide certification to the participants who successfully respond to a short survey with questions aiming to check their active participation. This trial continues. It is intended that it will become semi-automated in the future.

9 Education, certification, and professional standards[17]

9.1 Education - Academia and IEA Relationships

One of the aims of the Executive during the 2021-2024 term was to increase collaboration between the Executive Committees, as much of the work to achieve IEA objectives requires input from different perspectives, and working together, as is well-accepted, is more efficient and achieves better and quicker outcomes. This section highlights the collaborative work between the Professional Standards and Education (PSE) and International Development (ID) Standing Committees and the ad hoc Chair of Strategic Development and Implementation.

9.1.1 PhD Program in HFE for Latin America and the Caribbean Region

This is an ongoing project conducted by the International Development Standing Committee and the Professional Standards and Education Standing Committee in collaboration with regional universities and with personal support of the IEA President.

What is the value-added topic?

- Prior to this project there were no master's level or PhD programs in Latin America and the Caribbean Region that could prepare highly qualified HFE professionals.
- Providing the training of high-level researchers for Latin America and the Caribbean adds value to the HFE profession in these regions.

Alignment with the Strategic Policies of the IEA

- Engage stakeholders (Policy 1)
- Collaborate with and reinforce IEA Networks (here ULAERGO) (Policy 2)
- Contribute to the development of science and practice of HFE in the region (Policy 3)
- Promote HFE education in the region (Policy 4)
- Strengthen relationships with external partners (Policy 5)
- Reinforce the infrastructure of the association by improving communication with and within IEA Networks (Policy 6)
- Maintain a future focus for the development of HFE in Latin America and Caribbean region (Policy 7)

What are the needs?

- Need for management of the development of Latin American PhD programs given the geostrategic conditions of the different universities.
- Need to create a hybrid-model HFE doctorate with online and in-person contact.
- Need to offer the course to other Latin American countries in the region (for example, Bolivia which just formally founded its society)

[17] The principal contributors to this chapter were José Orlando Gomes, IEA President, and Takeshi Ebara, Chair of the Education and Professional Standards Standing Committee, along with Anindya Ganguli Kumar, Chair of the International Development Committee.

Table 9.1 Main stakeholder group table

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committees ID and PSE	• Project oversight • High-level stakeholder engagement • Project facilitation together with ULAERGO, and regional universities	Influencer and expert
IEA Networks (ULAERGO) and Federated Societies in the region	• Coordination of necessary alliances between universities • Supporting and cooperating on the project	Influencer, expert and actor
Regional universities	• Establishment of an expanded committee for doctorate-level training in HFE • Collaboration on curriculum development • Offering the course to other Latin American countries in the region • Educate and produce highly educated personnel specialized in HFE	Decision makers and actors
External stakeholders (local authorities)	• Approval of the course by the appropriate national Ministry of Education	Decision makers
Students	• Acquisition of HFE professional competence that can contribute to the development of HFE in the region	Actors

Table 9.2 Stakeholder table – Individuals

Stakeholder Group	What is this person's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• José Orlando Gomes • Andrew Todd, Strategic Development and Implementation • **ID co-chair**: Paulo Antonio Barros Oliveira • **ID co-chair**: Martin Rodriguez • **PSE co-chair**: Joao Alberto Camarotto	Influencer and expert
Stakeholder Group	**What is this person's role within the Project?**	**System actors/ experts/ decision-makers/ influencers**
IEA Network (ULAERGO) and Federated Societies in the region	• Carlos Espejo, president of ULAERGO • Martha Saravia, President of the Colombian Society of Ergonomics • Members of the Argentine Society of Ergonomics	Influencer, expert, and actor

Regional universities	• Universidad del Valle
	  • Jesús Alberto Hernandez, Dean of the Faculty of Health
	  • Juan Carlos Velasquez, Director of the Doctorate Program in Ergonomics
	• The National University of Colombia
	• National Technological University of Argentina
	• Federal University of Rio Grande do Sul
		Decision makers and actors

External stakeholders (local authorities)	• Ministry of National Education • Ministry of Labour	Decision makers
Students		actors

Table 9.3 Main stakeholders and their relationship to each other

To / From	**Executive and standing committees**	**IEA Networks and associated societies**	**Regional universities**	**Local authorities**	Students
Executive and standing committees		Supporting and cooperating on the project	Coordination of necessary alliances between universities	Fostering awareness of the necessity of HFE, and its status in the region	-
IEA Network and associated societies	Requesting human and knowledge support to move the project forward				Promoting public relations and dissemination of the necessity of HFE
Regional universities	Request for cooperation in curriculum development and establishment of educational programs			Application for approval to establish a PhD program in HFE	Recruiting and opening registrations for the PhD course Providing the training of high-level researchers for Latin America and the Caribbean
Local authorities	Cooperation to promote the education level of HFE professionals in the region, and support the dissemination of HFE		Grant approval to establish a PhD program in HFE		-
Students	-	-	Receive advanced HFE training	-	

Benefits to stakeholders

- Providing HFE educational opportunities in the region and contributing to increasing the number of highly educated people in HFE
- Improvement of HFE professional competence that can contribute to the development of HFE in the region
- Promoting the development of science and practice of HFE in the region
- Raising the awareness and status of HFE in the region

Outcomes so far

Colombia

- In November 2021, Professor Juan Carlos Velasquez Valencia led the Forum on Public Health titled "Ergonomics and Human Factors EFH, Public Health and Counter-Hegemony." The event featured a discussion on the development of human factors/ergonomics in a globalized context and included such notable speakers as José Orlando Gomes and Yushi Fujita.
- In 2022 the Doctorate in Ergonomics was approved by the Ministry of National Education, Colombia, and the PhD Program on HFE for Latin America and the Caribbean, Universidad del Valle, Cali, Colombia. A hybrid model was launched in August 2022. The first cohort had 15 students from 6 Latin American countries: Mexico, Colombia, Ecuador, Peru, Chile, and Uruguay. The students came from different fields of study, such as industrial and environment engineering, medicine, psychology, and physiotherapy.
- Key aspects included foundational lectures by prominent human factors/ergonomics leaders and the signing of the first international agreement with Cuba's Instituto Superior Politécnico José Antonio Echeverria.
- Throughout 2022, the program hosted a series of public lectures on ergonomics covering such topics as the history and future of ergonomics, innovation, sustainability, health workers, and informal work. Speakers included experts such as Yushi Fujita, Andrew Thatcher, and Oscar Betancourt.
- The application for the second cohort was open for new 15 students until June 28, 2023, and this time it included the Caribbean region as well. The third cohort in 2024 has 12 students enrolled in the admission process but it has not been not finalized.

In June 2023, Prof. Velasquez Valencia and the first cohort of the Doctorate in Ergonomics organized an international ergonomics meeting, attracting more than 600 participants from more than 20 institutions.

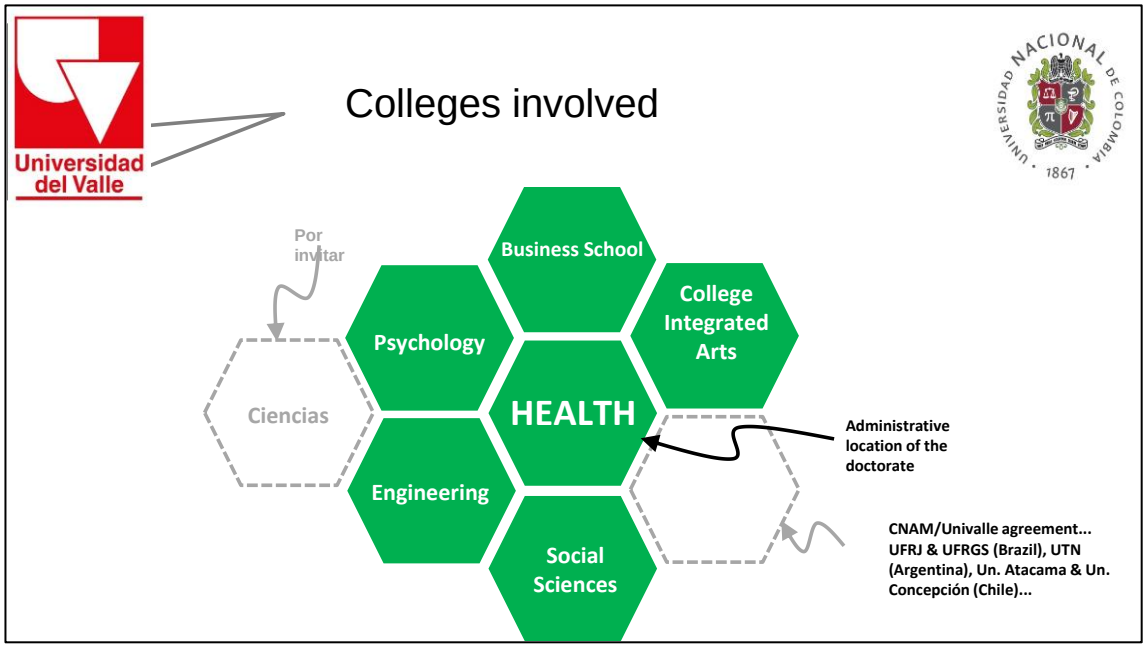


Figure 9.1 Partners in Colombia education development project

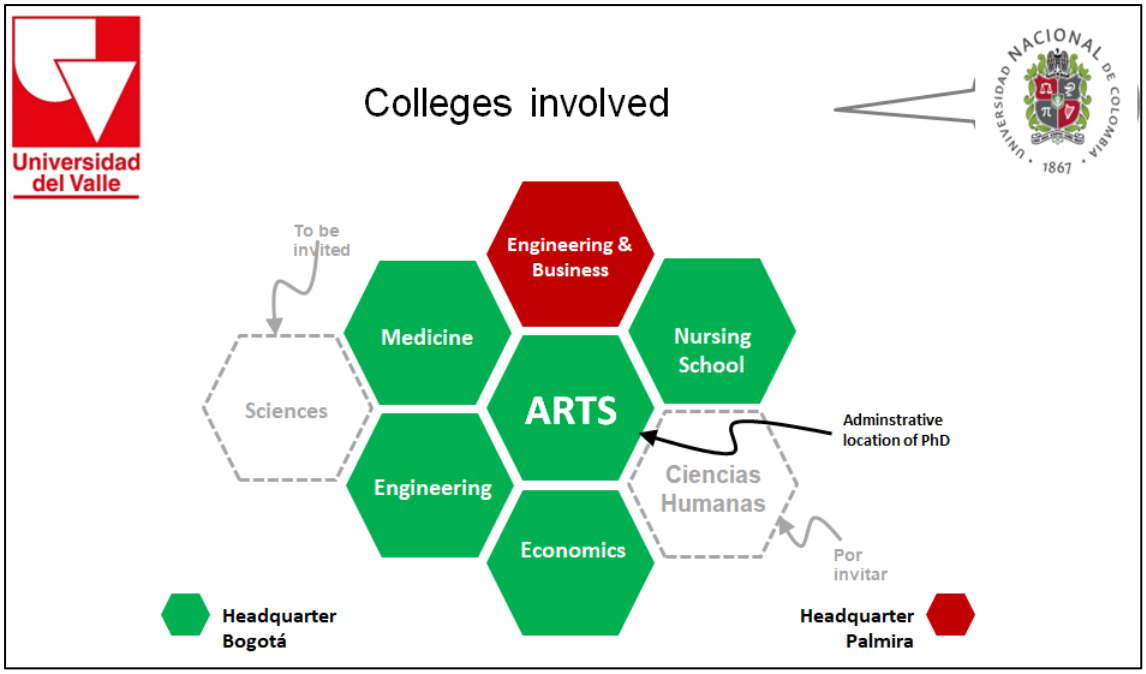


Figure 9.2 Faculties involved

- In **Argentina** the National Technological University of Argentina and members of the Argentine Society of Ergonomics are preparing a master's degree in HFE, and the draft of the curriculum is ready. An agreement with the Doctorate Program on HFE for Latin America and the Caribbean at the Universidad del Valle is under discussion to ensure international professional standing and to offer this course to other Latin American countries in the region, for example Bolivia, which just formally founded its society.

- In **Brazil**, organization and development of a master's degree in human factors and ergonomics at the Federal University of Rio Grande do Sul, with the support of the Brazilian Federated Society ABERGO and the Ministry of Labour, aimed exclusively at training 15 labor inspectors in HFE.

9.1.2 Collaborative Program JES/CPEJ/CNAM/IEA

This is an ongoing collaboration project for developing an education toolkit for HFE core competencies with the Conservatoire Nationale des Arts et Métiers (CNAM), Paris; Japan Human Factors and Ergonomics Society; Japanese Board of Certification of Professional Ergonomists (BCPE-J); the PSE Standing Committee; and the IEA Committee on Strategic Development and Implementation (SDI).

What is the value-added topic?

- The IEA document on HFE core competencies was revised in 2021 on the initiative of the former PSE Subcommittee on Certification. It stresses applying the systems approach. However, the systems approach has not been fully realized in the practice of occupational safety and health, R&D process, or management in companies.

- The role of HFE is to understand the interactions among humans and system components. This is accepted in general, but there is insufficient common

understanding of how to design and implement solutions for optimizing interactions in the holistic view of a system.

- Therefore, the development of hands-on training for HFE personnel/practitioners in response to the industry 4.0 era is a value-added topic for IEA

Alignment with the Strategic Policies of IEA

- Engage stakeholders (Policy 1)
- Promote HFE science, technology, and practice (Policy 3)
- Promote HFE education, certification, and professional standards (Policy 4)
- Maintain a future focus for HFE (Policy 7)

What are the needs?

- The world is now facing the era of Industry 4.0/Society 5.0. The term *disruptive technology* has become frequently used to transform current working styles into new-value ones. But how should HFE practitioners apply disruptive technologies appropriately to daily life or daily working style? Industry 4.0 includes intelligent digital technologies like IoT networks, AI, Big Data, and robotics. These are already applied in manufacturing, industry, and service processes.

- Such technological innovation increases productivity but also introduces new health risks for workers. So, they have advantages and disadvantages; the results for people are ambivalent. How should HFE practitioners be trained in regard to OSH or develop products or systems in companies to address the issues between human well-being and system performance in the Industry 4.0 era? Currently HFE lacks a practical training tool to address Industry 4.0.

- Traditionally occupational health and safety (OSH) takes a "forecasting" approach; for example, practitioners find emerging/existing issues to be solved through direct observation in the field. After that, they organize them according to priority, and then they make a hypothesis or research question and conduct a survey or experiment. This is the "forecasting-based approach" to solve problems. They are addressing the problems one by one as they identify the issues. Another approach currently raising interest is the “back-casting” method. Back-casting sets “desired future goals” first. The next step is to identify the issues or development technologies to achieve the desired future, going from the future back to the present. If HFE practitioners could draw an appropriate desirable future in terms of OSH first, they might contribute to leading appropriate development, dissemination, and implementation of new technologies in advance before problems arise. HFE personnel or practitioners need to adopt such a back-casting method given their knowledge of the interactions between the human and system components to design proactive solutions.

Table 9.4 Outline of the project

Category	Description
Broad Outline	Development of abilities of HFE practitioners in industry to address designing solutions for Industry 4.0.
Goal	• Developing “hands-on training” tool kit for HFE personnel/practitioners • The aim is to eventually disseminate and implement the toolkit into HFE communities to share output/experience with the Federated Societies of IEA, as a model case of practical training on HFE responding to new core competencies.
Needs	• Need for acquiring new HFE competencies (Education + Experience) responding to disruptive technology in the Industry 4.0/Society 5.0 era. • Need for HFE implementation skills for providing solutions based on systems approach and activity theory • Need for acquiring a back-casting method given interactions between human and system components to design solutions.
Contents	• Providing theoretical background of systems approach and activity theory • Training experience that can identify needs, analyze the problems, and build design solutions working in the real world using core competency skills. Education teaches skills but experience brings competence in using those skills. The tool intends to acquire the experience that aligns with each component of the revised core competencies. • Acquiring back-casting methods to disseminate and implement HFE solutions. Collaborating with stakeholders and exchanging ideas to identify the issues or development technologies to achieve the desired future and then implementing recommendations to optimize human well-being and performance.
Stakeholders	As per stakeholder table
Benefits	Fulfilments of all the needs identified above can lead to improving core competencies of personnel/practitioners/professionals of HFE

Table 9.5 Main stakeholder group table

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• Project oversight • High-level stakeholder engagement	Influencer and expert
PSE, STP, SDI, and FoW	• Project facilitation together with PSE, STP, SDI, and FoW	Influencer, expert, and actor
Local Societies (ACED, SEANES, JES/CPEJ)	• Exchange lessons learned from other regions • Participation in panel discussion workshop • Collaboration on the toolkit development • Conducting a trial workshop using the toolkit	Influencer, expert, and actor
Council members (Federated Societies)	• Providing feedback on final product for ongoing optimization • Identifying local needs for the toolkit	Decision makers and actors
Regional universities, academics, and companies	• Identifying local needs in companies • Developing the hands-on training toolkit • Identifying relevant stakeholders for implementation • Conducting workshops for training trainers about the toolkit	Decision makers, experts, and actors

Table 9.6 Stakeholder table – Individuals

Stakeholder Group	What is this person's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• José Orlando Gomes	Influencer and expert
PSE, STP, SDI, and FoW	• **PSE:** Takeshi Ebara, Tahar Hakim Benchekroun • **STP:** Nancy Black • **SDI:** Andrew Todd • **FoW:** Andrew Thatcher	Influencer, expert, and actor
Local Societies (ACED, SEANES, JES/CPEJ)	• Takashi Toriduka, president of the JES • Yoshiko Yagi, president of the CPEJ and Akiko Ide, vice president of the CPEJ • Anindya Ganguli (ACED)	Influencer, expert, and actor

Stakeholder Group	What is this person's role within the Project?	System actors/ experts/ decision-makers/ influencers
Council members (Federated Societies)		Decision makers and actors
Regional universities, academics, and companies	• the Conservatoire Nationale des Arts et Métiers (CNAM), Paris • The University of Occupational and Environmental Health, Japan • Nihon University • Itoki Corporation • NEC Corporation	Experts

Table 9.7 Main stakeholders and their relationship to each other

From \ To	IEA Executive	Standing committees	Local Societies (ACED, SEANES, JES/CPEJ)	Council members (Federated Societies)	Regional universities, academics, and companies
IEA Executive		Project oversight Guidance on IEA core competencies and advice on how to align with IEA policies	Disseminating and promoting IEA value-added topics on practical training Disseminating and promoting IEA value-added topics on practical training		-
Standing committees	Consultation on how to proceed with the project		Coordinating and supporting the development of a local toolkit based on local needs		Identifying local needs and barriers
Local Societies (ACED, SEANES, JES/CPEJ)	-	Inputting and sharing lessons learned from local needs		Mutual exchange of ideas on effective training programs through collaborative activities	Support for disseminating and implementing the toolkit into each sector
Council members (Federated Societies)			Mutual exchange of ideas on effective training programs through collaborative activities		
Regional universities, academics, and companies	-	Sharing local needs and barriers	Collaboration to disseminate and implement the toolkit between Federated and local societies		

Benefits to stakeholders

- Improved core competencies of personnel/practitioners/professionals on HFE
- Acquiring a cutting-edge back-casting approach to respond to the Industry 4.0 era.
- Improved skills in systems approach based on activity theory
- Enhanced reputation of HFE in the public

Outcomes so far

- Regular meetings of the working group:
  Monthly meetings with CNAM (Paris) and JES/CPEJ (Japan) held from March 2022
- Sharing and exchanging knowledge and practice on the systems approach and activity theory in France and Japan
- Organizing of a panel discussion entitled "The systems approach, its theory and practice" at the Triennial Congress of the IEA (IEA2024) to share and exchange the project results with members of Federated Societies

Future activities

- Signing of MOUs between CNAM and UOEH, to continue this project after finishing the current term
- Creation of the hands-on training toolkit
- Conducting trial workshops for training trainers about the toolkit

9.1.3 Master's Program on HFE in Italy

This project was conducted through collaboration among two IEA Standing Committees—International Development and Professional Standards and Education—and was facilitated by the IEA President. In Italy the project is headed by Prof. Riccardo Tartaglia at Marconi University[18].

The master's degree in Ergonomics and Human Factors in Complex Organizations aims to provide the knowledge and skills needed to design products, activities, and environments to optimize their use by humans. In particular, the following topics will be addressed:

- Analysis of the effects of production technology on humans in terms of health, performance, and behavior.
- Design of work situations appropriate to the needs of the task and the capabilities of the operators, to avoid physical and mental harm and increase performance.
- Health and safety promotion at work in different work environments.

The educational program of the master's degree in Ergonomics and Human Factors in Complex Organizations is divided into the following modules:

Module A - Principles of Ergonomics
Module B - Populations and general human characteristics
Module C - Technical systems design
Module D - Research, evaluation, and investigation techniques
Module E - Professional matters
Module F - Analysis of activity and/or work
Module G - Ergonomic interventions

[18] https://www.unimarconi.it/master-di-primo-livello-in-ergonomia-e-fattori-umani-nelle-organizzazioni-complesse/

Module H - Physiological and physical aspects
Module I - Psychological and cognitive aspects
Module J - Social and organizational aspects

The classes will be held online and will also be available on demand (recorded).
At the end of the course, those who have achieved all the required criteria and successfully passed the assessment tests will earn the 60 recognized credit points and will be awarded the university master's degree pursuant to Ministerial Decree 270/2004.

Completion of the master's degree will give the students the 60 CFU (equivalent to one year of full-time education) on the specific topics which are required by the Centre for Registration of European Ergonomists (CREE). After completion of the necessary professional experience, the graduates will be able to apply for certification as HFE professionals, as recognized across Europe.

9.1.4 Master's Program for Sub-Saharan Africa

This International Development Project was conducted in collaboration with the Future of Work Task Force Chair, the Communication and Public Relations Standing Committee, and the Chair of the Ad Hoc Committee on Strategic Development and Implementation.

A two-pronged approach of a coursework master's degree in HFE and a bridging short course in HFE is being considered.

The Ergonomics Society of South Africa (ESSA) Professional Affairs Board Formation Model was adopted as the base of the program, and the group is now looking at what are the preparatory requirements for the program (what should participants already know before embarking on the master's program) and what are the core components to include in the master's program. Specifically, this focuses on what is missing from the Formation Model (content or process) that should be included in this uniquely African program.

9.1.5 Development of a Collaborative HFE PhD Program for Asia

This project was conducted by the International Development Standing Committee in collaboration with the Professional Standards and Education Standing Committee.

Why is a collaborative HFE PhD Programme in Asia necessary?

- Asia comprises more than 50 countries. Of these, according to statistics registered in the IEA Educational Map (see 9.1.7), only 9 countries provide HFE education at universities in Asia. Within these 9 countries, only half have doctoral programs. More than 37 countries in Asia have neither universities nor societies for HFE.
- Although some countries in Asia have master's programs and a few have doctoral programs in HFE, there is a need to develop a pan-Asian program aligned to the requirements of the region.
- The experience of the development of such a program for Latin America could be leveraged for Asia.
- The development of HFE education in Asia aligned to regional needs is a value-added topic for the IEA

Alignment with the Strategic Policies of the IEA

- Increase stakeholder engagement (Policy 1)
- Reinforce collaboration within the regional HFE network (ACED) (Policy 2)

- Contribute to the development of science and practice of HFE in the region (Policy 3)
- Promote HFE Education (Policy 4)
- Maintain a future focus for the development of HFE in the Asia region (Policy 7)

What are the needs?

1. Need for faculty members trained in HFE in the region.
2. Need for qualified HFE personnel for industry

Table 9.8 Outline of the project

Category	Description
Broad Outline	Growth of human factors and ergonomics education programs in Asia tailored to regional needs
Goal	Increased quantity and quality of HFE doctoral programs in Asia
Needs	• Need for trained faculty • Need for qualified HFE personnel for industry • Need for an international-level doctoral program in HFE
Contents	• HFE doctoral programs that draw from the cream of the HFE expertise available in Asia (coordinated by ACED), supplemented by international experts facilitated by IEA • HFE programs strongly aligned to the problems and culture of the region • HFE programs funded by regional corporations and universities, focused on the current growth areas in the region
Stakeholders	As per stakeholder table
Benefits	Fulfilment of all the needs identified above

Table 9.9 Main stakeholder group table

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• Project oversight • High-level stakeholder engagement	Influencer and expert
ID, PSE, and SDI	• Project facilitation together with ACED • Guidance on curriculum development • Lessons learned from other regions (e.g., collaborative PhD program for Latin America)	Influencer, expert, and actor
ACED, SEANES	• Regional project lead • Coordination of ACED and IEA meetings • Coordinate and participation in stakeholder and curriculum workshop	Influencer, expert, and actor

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
Federated Societies in the region	• Collaboration on curriculum development • Identification of interested universities and associated stakeholders • Development and participation in stakeholder and curriculum workshop	Decision makers and actors
Global Societies (HFES, CIEHF)	• Guidance on curriculum development • Capacity building (PhDs trained in USA and Europe) • Participation in stakeholder and curriculum workshop	Experts
Regional universities and academics	• Local experts in curriculum needs (i.e. what are the needs for science and practice) • Identify relevant stakeholders for implementation • Participants in program implementation (in various capacities) • Conducting workshops for (1) stakeholder involvement and (2) curriculum workshop	Decision makers, experts, and actors

Table 9.10 Stakeholder table – Individuals

Stakeholder Group	What is this person's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• José Orlando Gomes	Influencer and expert
ID, PSE and SDI	• **ID**: Anindya Ganguli, Martin Rodriguez, Paulo Antonio Barros Oliveira, Liang Ma, Jennifer Guiterrez, Chris Reid • **PSE**: Takeshi Ebara, Yassierli • **SDI**: Andrew Todd	Influencer, expert, and actor
ACED	• Anindya Ganguli (convenor), Frederick Tey, Swati Pal, Rauf Iqbal, Loh Ping Yeap	Influencer, expert, and actor
Federated Societies	• CES (China), HKES (Hongkong), ISE (India), PEI (Indonesia), JES (Japan), ESK (Korea), HFEM (Malaysia), HFESP (Philippines), HFESS (Singapore), EST (Taiwan), EST (Thailand)	Decision makers and actors
Global Societies	• HFES: Chris Reid • CIEHF: Barry Kirby	Experts

Stakeholder Group	What is this person's role within the Project?	System actors/ experts/ decision-makers/ influencers
Regional universities and academics	• Tsinghua University, China • University de La Salle, Philippines • National University of Kyushu, Japan • Indian Institute of Technology – Bombay, India • Indian Institute of Management – Mumbai, India • University of Calcutta, India	Decision makers, experts, and actors

Table 9. 11 Main stakeholders and their relationship to each other

From / To	**Executive**	**Standing committees (ID, PSE as key drivers)**	**IEA Network and associated societies**	**Local Universities**	**External stakeholders**
Executive	Project oversight	Facilitation of project with ACED	Identify potential growth areas Support the access to relevant stakeholders (including universities, government officials, etc) Facilitation of program development	Identify demands (i.e., value-added topics and needs) within Asia Identify stakeholders for implementation Workshop implementation	External stakeholders need for stakeholder group D to implement workshop
ID, PSE	Guidance on IEA core competencies and relevance to local context	Promotes IEA Education program value-add and needs	Oversight	Support for curriculum development	Local needs and barriers identified
IEA Networks/Societies	Curriculum development that is contextually relevant but focused on systemic nature of HFE		Coordinate regional education program development	STP supports work of TCs	Support CPR - work to disseminate information to societies
Local Universities	Identification of local needs and stakeholders for curriculum development			Collaborative HFE PhD Program development for Asia	Members of TCs from Federated and Affiliated Societies
External stakeholders	Identification of local needs: Constraints and affordances				Key stakeholders for program initiation

Benefits to stakeholders

- Improved knowledge and skills
- Increased HFE reach and relevance
- Increased job opportunities
- Improved input for HFE certification
- Qualified talent pool for organizations
- “Train the Trainer” effect
- Enhanced reputation of universities and faculty
- Enhanced technology level of the students
- Economic benefits (faculty)

Outcomes so far

- Survey carried out among stakeholders across countries in the region to understand the current status and to identify the needs and strategic preferences
- Seven meetings of the working group held so far (last one in January 2024)
- Program to be started at Tsinghua University, with University de la Salle as a hub. Other universities and faculty (e.g., from Japan, India, and other countries) would be added step by step.
- Draft MOU exchange

Future activities

- Signing of MOUs (some already exist; e.g., between Tsinghua and Kyushu universities)
- Creation of inventory of collaborating universities/institutes and faculty
- Starting the program

9.1.6 Development of an HFE Training Program for Vietnam

This project was conducted by the International Development Standing Committee in collaboration with the Professional Standards and Education Standing Committee.

Why develop a training program for Vietnam?

- Vietnam has significant HFE expertise, but the programs carried out are not in accordance with the IEA concept of high-quality HFE.
- Vietnam has identified the need and desire for HFE education (currently there are no MS or PhD programs in HFE).
- Training the trainers is a high-level project of the IEA with which this project is aligned.
- Creation of the program is likely to lead to the formation of a Vietnamese Human Factors and Ergonomics Society, and its entry into ACED and IEA.
- The development of an HFE training program in Vietnam is a value-added topic for the IEA

Alignment with the Strategic Policies of IEA

- Increase stakeholder engagement (Policy 1)
- Reinforce collaboration within the regional HFE network (ACED) (Policy 2)
- Contribute to the development of science and practice of HFE in the region (Policy 3)
- Enhance the contribution of IEA in promoting HFE Education (Policy 4)

- Maintain a future focus for the development of HFE in the Asia region (Policy 7)

What are the needs?

- Need for highly trained HFE personnel as faculty for HFE programs
- Creation of a pool of qualified HFE personnel for industry
- Access to regional HFE networks (ACED) and global networks (IEA)

Table 9. 12 Outline of the project

Category	Description
Broad Outline	Growth of human factors and ergonomics education programs in Asia tailored to regional needs
Goal	Creation of a high-quality HFE training program for Vietnam
Needs	• Need for trained faculty • Need for qualified HFE personnel for industry
Contents	• HFE training programs aligned to the IEA Core Competencies • Creation of a pool of trainers, producing a multiplier effect
Stakeholders	As per stakeholder table
Benefits	• Faculty trained in high-quality HFE • Creation of a pool of qualified HFE personnel for industry

Table 9.13 Main stakeholder group table

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• Project oversight • High-level stakeholder engagement	Influencer and expert
ID, PSE and SDI	• Project facilitation together with ACED • Guidance on curriculum development • Facilitation of involvement of international faculty	Influencer, expert, and actor
ACED	• Regional project lead • Coordination of ACED and IEA meetings • Coordination and participation in stakeholder and curriculum workshop	Influencer, expert and actor
Federated Societies in the region	• Collaboration on curriculum development • Identification of interested universities and associated stakeholders • Development and participation in stakeholder and curriculum workshop	Decision makers and actors
Global Societies	• Guidance on curriculum development • Capacity building (PhDs trained in USA and Europe)	Experts

(HFES, CIEHF)	• Participation in stakeholder and curriculum workshop	
Stakeholder Group	**What is the stakeholder group's role within the Project?**	**System actors/ experts/ decision-makers/ influencers**
Regional universities and academics	• Local experts in curriculum needs (i.e., what are the needs for science and practice) • Conducting workshops for (1) stakeholder involvement and (2) curriculum workshop	Decision makers, experts, and actors
External Stakeholders	• National Institute of Occupational and Environmental Health, Vietnam	Decision makers and actors

Table 9. 14 Stakeholder table – Individuals

Stakeholder Group	**What is this person's role within the Project?**	**System actors/ experts/ decision-makers/ influencers**
IEA Executive Committee	• José Orlando Gomes	Influencer and expert
ID, PSE and SDI	• **ID**: Anindya Ganguli • **PSE**: Takeshi Ebara • **SDI**: Andrew Todd	Influencer, expert, and actor
ACED	• Anindya Ganguli • Frederick Tey	Influencer, expert, and actor
Federated Societies	• CES (China), ISE (India), PEI (Indonesia), JES (Japan)	Decision makers and actors
External Stakeholders	• National Institute of Occupational and Environmental Health, Vietnam	Decision makers and actors

Table 9.15 Main stakeholders and their relationship to each other

To \ From	**Executive**	**Standing committees (ID, PSE as key drivers)**	**IEA Network and associated societies**	**Local Universities**	**External stakeholders**
Executive	Project oversight	Facilitation of project with ACED	Identify potential growth areas Support the access to relevant stakeholders (including universities, government officials, etc) Facilitate program development	Identify demands (i.e., value-added topics and needs) Identify stakeholders for implementation Workshop implementation	External stakeholders need for stakeholder group D to implement workshop
ID, PSE	Guidance on IEA core competencies and relevance to local context	Promotes IEA Education program value add and needs	Oversight	Support for curriculum development	Local needs and barriers identified
IEA Networks/Societies	Curriculum development that is contextually relevant but focused on systemic nature of HFE		Coordinate regional education program development	STP support with resource persons	Entry as a Federated Society
Local Universities	Identification of local needs and stakeholders for curriculum development			High-quality HFE Training Programme for Vietnam	Members of TCs from Federated or Affiliated Societies

External stakeholders	Identification of local needs: Constraints and affordances				Key stakeholders for program initiation

Benefits to stakeholders

- Improved knowledge and skills
- “Train the Trainer” effect
- Improved input for HFE certification
- Qualified talent pool for organizations
- Economic benefits (benefits of local facility)
- Increased quality of HFE practice

Outcomes so far

- Knowledge of HFE activities and status in Vietnam
- Exploration and understanding of needs and demands
- Creation of a road map and timetable.

9.1.7 HFE Educational map

On the IEA website, IEA provides a global map of educational institutions that offer HFE programs. The database is continuously updated with new data. Two types of interactive interfaces have been provided. The Google Map system and the Google Earth system are shown below. Each pin on the webpage is an HFE educational institute. The colors of the pins stand for the different degree levels provided in that department. Blue represents institutions providing doctoral degrees.

Up-to-date webpage link: https://iea.cc/global-hf-e-education-map/

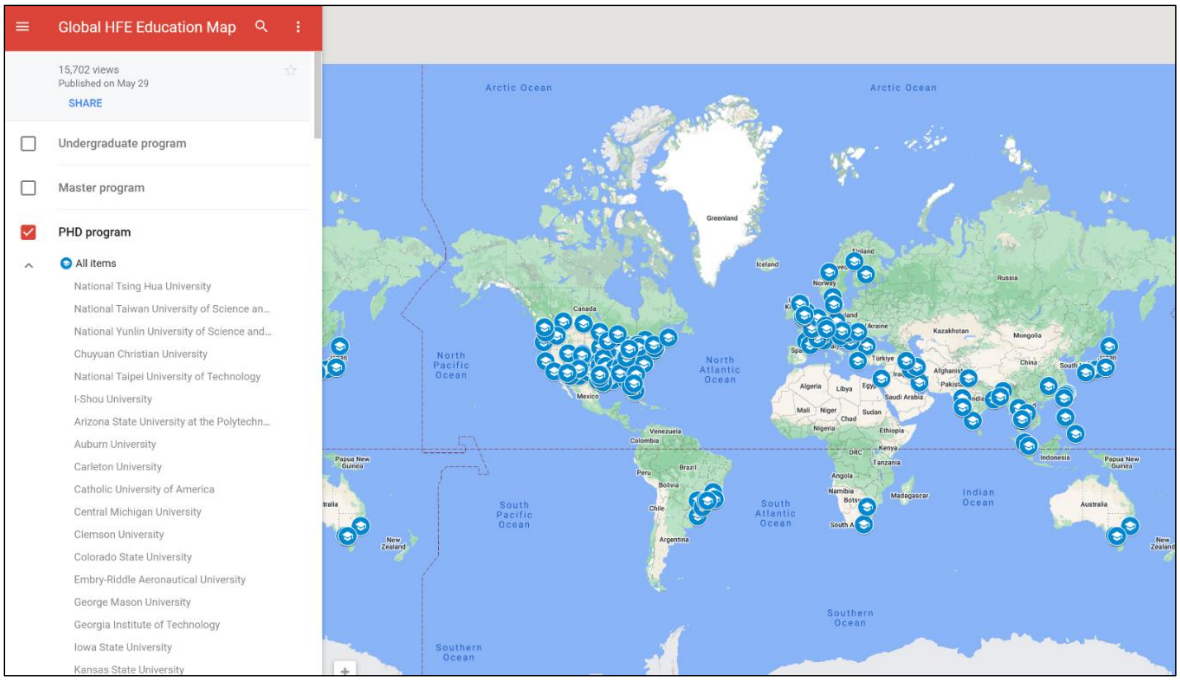


Figure 9.3 The global HFE educational map on the Google Maps System

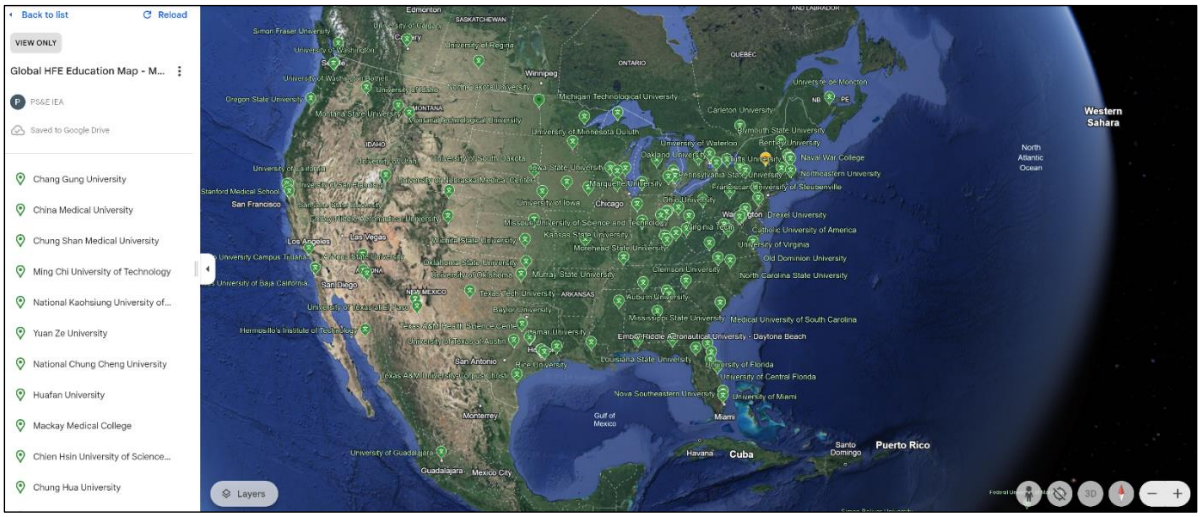


Figure 9.4. The global HFE educational map on the Google Earth System

What is the value-added topic?

- The map supports HFE education, as well as enhancing knowledge exchanges among experts in this field from all over the world.
- The worldwide database of HFE educational information lets stakeholders know where to find suitable resources for HFE education or training. For example, professionals, researchers, and students who need information about the HFE educational/training resources in their region, or even worldwide, can find the information through this interactive webpage.

Alignment with the Strategic Policies of the IEA

- Engage Stakeholders (Policy 1)

- Promote HFE science, technology, and practice (Policy 3)
- Promote HFE education, certification, and professional standards (Policy 4)

What are the needs?

- Many public and influential stakeholders would like information about HFE education and training; however, it is often challenging to find suitable resources for this purpose.
- For those HFE educational institutes who need to extend or specialize their educational programs, knowing the program details of other HFE-related institutions in different areas will provide help.
- For students wishing to specialize in HFE, this map makes it easy to find educational institutions that can accept students for PhD or master's degrees in the field of HFE.
- For the institutions, it helps recruit PhD or master's students worldwide.

Benefits to stakeholders

- The map is freely available online in the form of an interactive webpage and anyone can access it. It is beneficial in delivering up-to-date information in the HFE field from IEA to researchers, scholars, and other professionals.
- Educational institutions can use the map to recruit master's or PhD students from all over the world.
- For companies that wish to start an international research project in collaboration with academia, it is possible to find research partners.
- For the IEA Executive, the map contributes to the development of a geographical strategy for the dissemination and implementation of HFE, based on the information about educational possibilities around the world.

Outcomes so far

- The data collection and its update were performed with tireless help from several IEA committees and Council members. This included contributions from 45 countries in Asia, North America, Latin America, Africa, and Europe that offer HFE education programs and have been registered in the map so far. As of July 2024, a total of 1,328 undergraduate courses, 422 master's programs, and 266 PhD programs were included. The data are not complete, and more data collection activities are still ongoing.
- The specifications of the map were revised, and it now provides a new layer for the intermediate level between bachelor's degree and master's degree. There are some practical programs worldwide that build on a bachelor's degree but offer less than a master's degree. These are often offered by a "college" rather than a university. This modification also suits some programs, such as one-year diplomas.

Future activities

- Need to request the cooperation of more Council members/Federated Societies and IEA Networks to register further institutions.
- The IEA Executive Committee should help connect potential candidates who can effectively assist in data collection from other Federated Societies in various regions.
- The registration of information on this map is performed manually by authorized personnel. A registration platform that enables efficient updating needs to be developed.
- Due to the various languages in different regions, language translation support for these regions will be needed.

9.2 Certification and Professional Standards

9.2.1 Endorsement of Certification Bodies

During the 2021-2024 triennial period no changes were made to the IEA documentation (Operating Procedures, guidelines, etc.), as it had been substantially updated in 2018.

The IEA does not certify individuals or products. However, it does endorse certification schemes that conform to the International Standard ISO/IEC 17024:2012 "Conformity assessment – General requirements for bodies operating certification of persons" and which have at least one category that requires certified people to demonstrate the IEA Core Competencies, including both the educational requirements (generally at least four years of tertiary-level training including at least one year of ergonomics/human factors content) and two years of independent professional experience. There are currently seven IEA endorsed certification systems.

Table 9.16. IEA-Endorsed Professional Certification Bodies

Region	Name of certification body	Professional-level title/s awarded (others may also be offered)	Website
Australia	Human Factors and Ergonomics Society of Australia (HFESA)	Certified Professional Ergonomist	www.ergonomics.org.au
Brazil	Association of Brazilian Ergonomists (ABERGO) – CisCEB	Ergonomista Certificado [CDEC]	www.abergo.org.br
Canada+	Canadian College for the Certification of Professional Ergonomists (CCCPE)	Certified Canadian Professional Ergonomist (CCPE)	www.cccpe.ca/en
Europe +	Centre for Registration of European Ergonomists (CREE). This organization coordinates certification bodies serving 22 countries, including CIEHF, SELF, and GfA.	European Ergonomist (Eur.Erg)	www.eurerg.eu
Japan +	Japan Human Factors and Ergonomics Society– Committee on Certification	Certified Professional Ergonomist (CPE)	www.ergonomics.jp/cpe/en

	of Professional Ergonomists		
New Zealand	Professional Affairs Board – Human Factors and Ergonomics Society of New Zealand	Fellow New Zealand Human Factors and Ergonomics Professional (FNZHFE) Certified New Zealand Human Factors and Ergonomics Professional (CNZHFE)	www.hfesnz.org.nz
South Africa	Ergonomics Society of South Africa	Certified Professional Ergonomist (CPE)	ergonomicssa.com/cea-cpe/
United States of America +	Board of Certification in Professional Ergonomics (BCPE)	Certified Professional Ergonomist (CPE) Certified Human Factors Professional (CHFP) Certified User Experience Professional (CUXP)	www.bcpe.org

+ These certification systems will accept applications for certification from outside their geographical region providing certain criteria are met. To find out the requirements contact the responsible body directly.

9.2.2 Core Competencies in HFE

The IEA Core Competencies in Human Factors and Ergonomics[19] was last revised in 2021. This document describes 27 areas of knowledge and skill that a qualified HFE specialist should be able to offer. These competencies are not an ideal but are minimal requirements for certification as an HFE practitioner, and the educational basis should be provided in master's degree-level programs. The competencies are not specific to any field of application, such as healthcare, industry, or transport, nor to any particular risk (human error, musculoskeletal disorders, etc.), as a basic education should equip students to work in a variety of areas.

These standards have been translated from English into Japanese, Spanish, German, and Farsi/Persian and are available on the IEA website. Many thanks to those who volunteered to take on the task of providing these translations.

[19] *CORE COMPETENCIES IN HUMAN FACTORS AND ERGONOMICS (HFE): Professional knowledge and skills. M. Graf (Ed.). IEA Press, 2021. ISBN: 978-0-9796435-4-5*

10 Relationships with external partners

IEA has well-established formal relationships with two United Nations organizations (WHO and ILO) and several leading international nongovernmental organizations (NGOs), including the International Organization for Standardization (ISO). Additionally, it has collaboration agreements (Memoranda of Understanding or MOUs) with several related professional organizations.

Interacting with prominent international organizations is one way to promote the awareness of IEA and the science of human factors/ergonomics on a global basis. These collaborations support most of IEA's objectives and strategic policies, but most particularly the enhancement of the contribution of the HFE discipline to global society.

The following is an overview of IEA's current external organizational relationships and descriptions of joint activities.

10.1 United Nations Organizations: ILO and WHO[20]

IEA is formally recognized as a partner by two United Nations (UN) organizations. The World Health Organization (WHO) has recognized IEA as a Non-State Actor and the International Labour Organization (ILO) recognizes it as a Non-Governmental Organization (NGO). There is a close liaison among these bodies in aspects to do with health and safety at work. Both regularly invite IEA to participate in meetings and working groups and on the formulation of documents and guidelines.

10.1.1 WHO Collaboration

In recent years the collaboration with WHO has particularly concerned improving patient safety, healthcare standards, and pandemic prevention. WHO formally invites a representative to attend both the WHO Executive Director Board meeting and the World Health Assembly, held in the World Health Headquarters and the Palais des Nations (United Nations), respectively, in Geneva, Switzerland. IEA Executive Committee thanks Michelle Robertson (HFES) for continuing to monitor the invitations following her term as Chair of Communications and Public Relations. It is desirable to have some continuity in this role, as the interactions between can be complex.

10.1.1.1 WHO guidance documents on healthcare workers and patient safety

Attention to HFE is included in the *WHO Global Patient Safety Action Plan 2021-2030*. (Strategic Objective 2: High-reliability systems; Strategy 2.4). Implementation of HFE methods and solutions will be critical to the implementation of this plan as well as in implementing patient-safety interventions. An official collaboration plan regarding HFE considerations in patient safety was developed by WHO and IEA and was then endorsed by the WHO Director General and Executive Board.

During this term IEA and WHO collaborated on a joint guidance document ***Applying Human Factors/ Ergonomics to Health Care for Patient and Health Care Worker Safety***, which will be

[20] Main contributors to this section were K. Mosier and A. Todd.

introduced at IEA2024. The intent of this document is to provide basic HFE guidelines and implementation strategies for global stakeholders in patient and health-care worker safety. The document will be accompanied by a complementary report, ***HFE Methods and Approaches for Health Care and Patient Safety,*** and a set of case studies published by IEA Press. The intent of the supplementary documents is to provide in-depth information, guidance, and practical examples to HFE researchers and practitioners in the field of health care and patient safety.

The WHO writing projects were organized by Kathleen Mosier and led by IEA Scientific Advisors/Authors Pascale Carayon (Human Factors and Ergonomics Society, USA), Marijke Melles (Human Factors NL), Sue Hignett (Chartered Institute of Ergonomics and Human Factors, UK), and Shanqing Yin (Human Factors and Ergonomics Society of Singapore). Additional contributors to these documents include Armagan Albayrak (Human Factors NL), Zachary Hettinger (Human Factors and Ergonomics Society, USA), Gyuchan Jun, (Chartered Institute of Ergonomics and Human Factors, UK), Sadaf Kazi (Human Factors and Ergonomics Society, USA), Seth Krevat (Human Factors and Ergonomics Society, USA), Robin Littlejohn (Human Factors and Ergonomics Society, USA), Sonja Paus-Buzink (Human Factors NL), Stavros Prineas (Human Factors and Ergonomics Society of Australia), Raj Ratwani (Human Factors and Ergonomics Society, USA), Raquel Santos (Portuguese Association of Ergonomics), Jonas Shultz (Association of Canadian Ergonomists), Patrick Waterson (Chartered Institute of Ergonomics and Human Factors, UK), and Kathryn Wust (Human Factors and Ergonomics Society, USA).

Michelle Robertson and Susan Hallbeck (both from the Human Factors and Ergonomics Society, USA) led the effort to collect and organize the sample of 20 case studies representative of the HFE approaches addressed in the two documents. These provide a large selection of valuable experiences that can be used as examples for continuous learning. The last project in the current IEA collaboration with WHO is the development and dissemination of a 12- to 15-minute video overview presentation on HFE and how it applies to patient safety. This video will summarize basic HFE principles and key factors related to patient safety management and outcomes in different contexts and can be used as part of training for patient safety, particularly in under-resourced countries and rural regions and for special populations. IEA is eager to assist in the completion and dissemination of the materials created during these collaborative projects.

10.1.1.2 World Patient Safety Day

In anticipation of World Patient Safety Day on the 17 September 2023, the World Health Organization (WHO) hosted the World Patient Safety Day 2023 Global Conference themed “Engaging patients for patient safety.” The International Ergonomics Association was invited to attend the meeting as a partner organization of WHO, and Andrew Todd was delegated to attend by the IEA President. Below is his report on activities undertaken during the meeting.

The primary focus of the first day of the meeting was to discuss the importance of providing patients and their families with a voice within the health care setting. Various WHO members and patient safety organizations were provided with a platform to discuss “taking forward action on patient and family engagement,” first by countries, partners, and health care services and secondly by patient organizations and patient safety advocates. Unfortunately, due to the nature of the progam, there was not time for questions or for exploring the various themes and how the various partner organizations fit into the discussion. Very few of the partner organizations were given an opportunity to express their contribution, as noted by the smaller number of organizations in the program with very

limited time allocated. However, discussions on this day with Carsten Engel and Peter Lachman were fruitful and it would seem that it would be useful for the IEA to revisit our MOU with ISQUA, in particular for the next HEPS conference being hosted in Dublin (in 2025), where ISQUA is headquartered. IEA Executive Committee presence at HEPS with an invitation to ISQUA could be useful to explore.

The primary focus of Day 2 was to explore the draft Patient Safety Rights Charter through group work and discussions. The rights charter consists of a list of 16 patient safety rights that the WHO would like to publish and promote for global health-care systems to adopt. A key focus of agenda for the day was "zero harm," which is entrenched in one of the rights "Right to freedom from medical errors and hazards." Furthermore, the call for adoption by countries and stakeholders (attached to the rights) called for:

> *"Accountability, remedial and incentive mechanisms: Create or use existing mechanisms for holding health care institutions and professionals accountable for upholding patient safety rights. Designate clear channels for reporting violations and establish remedial actions to address non-compliance. Consider introducing compliance incentives which could range from recognition to financial rewards."*

It is clear (particularly from the last sentence) that the level of engagement with HFE within the drafting of the document was relatively low. Our group fed this back to the WHO in the feedback session that followed and placed an emphasis on the need for HFE to be better integrated into the development and implementation of the patient safety rights charter. It was also encouraging to see one of the other groups (admittedly, it had members from the 2018 IEA Triennial Congress organizing committee in it) also pushing the HFE agenda.

Figure 10.1 Participants at the meeting.

The fact that the WHO Director-General Dr. Tedros Adhanom Ghebreyesus was there to open the meeting demonstrates the importance placed by WHO on this flagship project. It was therefore significant that IEA was in attendance and able to contribute to the conversation and the draft patient safety rights charter. The WHO understanding and integration of HFE into its policies and charters, however, remains limited. It would appear to be important that IEA continues to seek ways to garner buy-in from key WHO stakeholders into what the discipline (both in research and practice) can contribute to the WHO and its efforts to improve health-care systems. In terms of the patient safety program; in particular, to emphasize the role of participatory HFE tools in bringing to light the various elements of the system and the interactions among them; for example, the use of SEIPS 3.0 to show the patient journey through the system and how this can improve the overall performance of the system. Andrew Todd's conclusion, following the event, was that the WHO members still have yet to either understand or buy into the power of HFE to achieve these goals.

10.1.1.3 Pandemic Prevention

Maggie Graf has attended several online meetings on behalf of IEA concerning the preparation of pandemic-preparedness documents. Although much of the discussion is only minimally related to HFE, she made several suggestions for the conduct of the project which were accepted and implemented. The final document is currently in the last stages of review. As a WHO partner IEA is expected to promote and support the recommendations in this document through its network.

10.1.2 ILO Collaboration

During this term, the ILO governing body voted to include occupational safety and health in the ILO Declaration on Fundamental Principles and Rights at work. This is a great endorsement of HFE and provides much support for our current and continued collaboration with ILO.

10.1.2.1 Publication on Manual Handling in the Workplace

After successful joint IEA/ILO publication in 2021 of "Principles and guidelines for human factors/ergonomics (HFE) design and management of work systems," Dr. Shengli Niu of ILO solicited IEA collaboration on a second IEA/ILO document intended to serve as a comprehensive resource and reference on global criteria, rules, and regulations for HFE and workplace manual handling. The UN agency plans to create new standards and recommendations for HFE in the workplace. The Review report on laws and practice related to human factors/ergonomics and manual handling at the workplace, was published jointly during this term. Dr. Shengli Niu of ILO and Kathleen Mosier of IEA coordinated and organized contributions; IEA member authors of the technical content include Yushi Fujita (Japan Ergonomics Society, IEA ACED Network, Japan), Maggie Graf (Swiss Ergonomics Society, Switzerland), Carisa Harris-Adamson (Human Factors and Ergonomics Society, USA), Wendy Macdonald (Human Factors and Ergonomics Society of Australia, Australia), Kathleen Mosier (Human Factors and Ergonomics Society, USA), Jim Potvin (Association of Canadian Ergonomists, Canada), David Rempel (Human Factors and Ergonomics Society, USA), and Andrew Todd (Ergonomics Society of South Africa, South Africa). Both documents are available at https://iea.cc/publication/.

10.1.3 Benefits to stakeholders

One of the principal objectives of IEA is to enhance the contribution of the human factors/ergonomics discipline to global society. The collaboration with UN agencies is, of course, one way of achieving this objective; however, these collaborations with UN agencies are important both in terms of dissemination of HFE at a global level and enhancing the reputation of IEA (and by extension of the member societies). These include:

- Promotion of HFE at highest global level
- Importance of documents/information that comes from UN agencies
- IEA benefits from high-level collaboration
- Acknowledgement – of the importance of HFE, of IEA as a collaborator and partner, and of expertise of HFE collaborators
- Promotion of HFE across the globe
- Benefit of society membership

Table 10.1. Main stakeholders and their relationships to each other

To: / From:	IEA Executive Committee	Council	Member Societies	ILO/WHO	Users of Materials
IEA Executive Committee		EC disseminates information to Council and solicits volunteers for these collaborative projects	EC expects information to be disseminated to member societies to access appropriate participants in the projects.	ILO and WHO solicit collaboration through the IEA EC. Both are UN agencies. Many requirements are the same for both, but the agencies operate differently. ILO for example supports activities with funding; WHO relies on value of association	Members of IEA Societies have access to materials as automatic benefit of membership. Other users
Council	EC members identify and manage external outreach and present MOUs to Council for approval		Council disseminates information to member societies. Members benefit from our relationships with UN agencies.	ILO and WHO engage Council members through EC. UN representatives attend IEA Congress	Council members are users and also disseminate materials to societies
Member Societies	EC serves as an opportunity provider for members to participate in UN collaborations and as a resource for member societies	Council disseminates information to member societies. Members benefit from our relationships with UN agencies.		Writers and reviewers come from member societies	Member societies are users and also disseminate materials to their members
ILO/WHO	EC leads and manages relationships with UN organizations	Council serves as interface between UN agencies and member societies	Member societies benefit from affiliation (through IEA) with UN organizations		Users see products of collaborations as benefits of UN and/or IEA membership
Users of materials	EC identifies dissemination path for materials, advertises them on the website.	Council members advertise the products of our collaborations to societies	Member societies disseminate documents to their own members, who disseminate it to others	These are the ILO and WHO member beneficiaries of the jointly produced products.	

10.2 International Organization for Standardization[21]

IEA has a formal liaison (Category-A liaison) with TC159 of the International Organization for Standardization (ISO). To strengthen this liaison, IEA formed an Advisory Group on Standardization (AGS) in May 2023. The mission of this group is to promote activities related international standardization in IEA and to contribute to the

[21] Main contributor to this secton was Shin'ichi Fukuzumi, chair of the Advisory Board for Standardization, first established as an ad hoc committee in 2023.

spread and development of ergonomics and human factors internationally through standardization. In this group, several experts who are involved in both ISO and IEA activities and are serving as liaisons between the two organizations. This allows for the exchange of ideas and proposals for new activities for mutual benefit. The IEA Liaisons for ISO are:

- ISO/TC159 IEA President José Orlando Gomes
- ISO/TC159/SC1 Peter Nickel
- ISO/TC159/SC4 Shinichi Fukuzumi
- ISO/TC159/SC5 Edwin Yap
- (SC3 and TC159/WG2 have not yet been assigned)

10.2.1 Role of the Advisory Group for Standardization

The role of the Advisory Group for Standardization is to contribute to the spread and development of ergonomics and human factors internationally,

10.2.1.1 Playing a role of Category-A liaison with ISO/TC159

The first tasks of the AGS were to:

- Assign a liaison person with each subcommittee in ISO/TC159
- Submit comments on documents and New Work Items through the liaison persons' discussion groups
- Regularly submit comments as IEA, thus improving the coordination of IEA's contributions.

10.2.1.2 Spread knowledge of International Standards to IEA stakeholders (Federated Societies, Affiliated Societies, Networks)

To achieve this aim, the AGS plan the following activities:

- HFE standardization at IEA2027 and some events by IEA Networks (e.g., ULAERGO, ACED)
- International standardization means not only ISO/TC159 but also the other related organizations (e.g., ISO/IEC JTC1 SC7) so these should be included.
- Cohosting events related to HFE standardization with external stakeholders (e.g., HFES, JES)
- Cooperate with IEA internal/external stakeholders with regard to promotion of standardizations

10.2.2 Achieved to date

- Regarding the role of ISO/TC159 Category-A liaison, assigned some liaison persons.
- We planned events at IEA2024 and in these events, current topics in ISO/TC159, the other HFE-related standardization themes, and standardization activities in non-HFE areas will be introduced.
- In developing regions (SOCHERGO and ACED), AGS introduced recent topics about HFE standardization.
- Formed contact with HFES and will have a panel session at the next HFES2024 in Phoenix, AZ, USA.
- AGS members engaged in discussion with David Caple, a project leader of “Ergonomics in a Nutshell,” from the viewpoint of company management including related standards.

10.2.3 Three-Year Plan

To contribute to the spread and development of ergonomics and human factors internationally, we have started three projects as described below.

1. Submit some documents to ISO/TC159 from IEA

   To play a role of Category-A liaison with ISO/TC159, we aim to carry out the following items.
   - Assign liaison persons for SC3 and WG2 and register all liaison persons (not only SC3 and WG2 but also other SCs) to SC members.
   - Registered liaison people are given the right to make comments on ballot documents (otherwise it is difficult for us to make comments for the documents; we have to recruit persons who collaborate with us for this activity).
   - After discussing the comments within AGS members, the liaison persons submit these comments to the appropriate SC in the form of CDR (Comment Disposition Report) documents from IEA.
   - Through discussions, find themes for new standards and submit New Work Item Proposal (NWIP) documents.

2. Transmit information and gather information on needs about international standardization related to HFE.

   To spread knowledge of International Standards (not only ISO/TC159 activities but also the other HFE-related standards) to IEA stakeholders (FS, AS, Networks), we will carry out the following items.
   - Organize events related to HFE standardization at IEA2027 (see above)
   - At this event, introduce some kinds of standards related to HFE
   - Require IEA Networks to take the opportunity to introduce International Standardization activities and collect their needs and requirements about HFE standards
   - Contact other stakeholders related to HFE standardizations, using the TC159 liaison community

3. Formulation of collaboration strategy with the other stakeholders

   To cooperate with IEA external stakeholders about promotion of standardizations, we will carry out the following items.
   - Participate in joint panel sessions at HFES2024 and talk about AGS activities
   - Organize a session related to HFE standardization to HCII 2025 (How to attract participants? Because many of standardization members are not researchers, it is difficult for them to attend academic conferences).

Table 10.2. Outcomes and Future Activities

	2024	2025	2026	2027	2030
Submit some documents to ISO TC159 from IEA	Explain AGS activities to TC159 plenary and each SC plenary →				
	Make comments for TC159 documents →				
Transmitting information and gathering needs about international standardization related to HFE	IEA2024 →				
	IEA2027 →	TC159 plenary ▽	detail plan ▽	UK ☆	IEA2030 →
		ULAERGO, ACED, etc... →			
Formulation of collaboration strategy with the other stakeholders	HFES2024 →	HCII2025 →	HFES2026 → Promote IEA2027		

Table 10.3. Stakeholder relationships

From \ To	AGS committee	FS/AS/Networks	The external stakeholders	TC159	Other standardization Organizations
AGS committee	A <> A	A >> B	A <> C	A <> D	A <> E
FS/AS/Networks	B >> A	B <> B	B << C	B << D	B << E
The external stakeholders	C <> A	C >> B	C <> C	C <> D	C << E
TC159	D <> A	D >> B	D <> C	D <> D	D <> E
Other standardization Organizations	E<> A	E >> B	E >> C	E <> D	E<> E

10.3 Related Professional Societies

IEA cooperates with a number of other international bodies with common or related goals. In some cases, Memoranda of Understanding (MOU) have been established to facilitate collaboration, mutual support, information exchange, and joint activities. At the present time IEA has MOUs with the following organisations:

- Foundation for Professional Ergonomics
- Institute of Industrial and Systems Engineering (IISE) Applied Ergonomics Society
- International Commission on Occupational Health (ICOH)
- International Council on Systems Engineering (INCOSE)

- International Occupational Hygienists Association (IOHA)
- International Social Security Association - Section Machine and Systems Safety (ISSA-M&SS)
- International Society for Quality in Health Care (ISQua)
- International Society of Pharmacovigilance (ISoP)

New collaborations with related professional societies continue to be developed and formally established through the exchange of MOUs. Generally, these encourage and support participation in each other's conferences, collaboration on joint projects, and communication among the organizations through respective websites, seminars, and workshops. In this way the contribution of HFE to these related disciplines is highlighted.

In addition to the MOUs mentioned previously, there is collaboration between the IEA Healthcare Ergonomics Technical Committee and the ICOH Scientific Committee on Occupational Health for Health Care Workers (OH-HCW) and between the IEA Technical Committee for Informal Work with the ICOH Scientific Committee on Occupational Health in Small-Scale Enterprises and the Informal Sector. Less-formal relationships exist between IEA Technical Committees and international professional organizations and scientific bodies, such as the Advanced Imaging Society, the World Design Organization, and the Institute of Industrial and Systems Engineers (Applied Ergonomics Branch).

Additionally, a number of international conferences for scientists and practitioners in related fields were endorsed by IEA, promoting the visibility of IEA and the interdisciplinary field of human factors/ergonomics (see Section 8.2).

11 Infrastructure of IEA

In the President's report (Section 1) under "Policy 6. Strengthen IEA's Infrastructure" José Orlando Gomes described the establishment of co-chairs for each of the Standing Committees. These are either regional representatives or hold responsibilities for specific aspects of the Standing Committee role. As yet, there are no formalities governing these appointments, which are decided between the appointed chair and the IEA President. However, continuity between executive teams has been identified as a significant issue for the sustainability of the IEA (see Section 11.2). It is anticipated, and highly recommended, that the incoming appointees to the positions of Chair of the Standing Committee will maintain at least some of the people appointed as co-chairs to ensure the continuity of projects and communication. The consequent increase in the number of people working on IEA programs has substantially increased the output of the IEA, without increasing costs, and the IEA Executive is very grateful for the work done by the people who have taken on these tasks with no reward other than our thanks.

Another change mentioned in the President's report is the use of social media platforms to advertise IEA-endorsed events and to provide information to interested people of HFE activities around the world. This practice was introduced during the previous administration team by the early-career team. It is highly recommended that this practice continues and is further developed. The IEA Facebook page currently has 2,300 followers, but not a lot of content, whereas LinkedIn has 13,700 followers and a lot of contributors and content. X has just under 500 followers and a lot of content. The content could be expanded onto platforms with more appeal in areas where these USA-based platforms are less popular.

11.1 Development of the Triennial Congress Model (CM)[22]

In 2019, the Development and Promotion Committee (DP) was asked to launch a project for developing a tool for designing and managing Triennial Congresses. A very preliminary version of the tool (i.e., Congress Model or just CM) was developed in 2020. Since then, the DP Committee has been trying to complete a version that could be implemented for IEA2024 and IEA2027 on a trial basis. It is expected that future DP teams will continue to expand and update the CM as a routine.

11.1.1 Background and reasons for the project

The IEA Triennial Congress is a flagship conference, providing opportunities:

- to present the latest scientific and technical achievements in the HFE field
- to learn/exchange up-to-date HFE.
- for students and young researchers to interact with world-class professionals.
- to present the cutting edge of HFE application that domain specialists may or may not be aware of, and
- to represent a major financial resource for IEA.

The Congress organizers and Executive Committees have worked hard to realize these opportunities; however, the Triennial Congress can be managed more comprehensively and effectively if the experiences from each EC are passed on for the future. This is the issue that the Development and Promotion Committee has been working on since the EC 2018-2021 term.

11.1.2 The goal of the project

The goal of the project is to develop a management tool that helps to make the organization of the Triennial Congress more efficient. The tool is called “The Congress Model (CM).” This goal is closely aligned with the Strategic Policies of IEA. The Triennial Congress is a vehicle to achieve all the IEA objectives as defined in the IEA By-laws.

11.1.3 Development process of the project

The figure below presents the development process of the CM. The initial development plan was developed using the Participatory Project Development Toolkit (P^2DT). P^2DT is explained in Section 5.3 of this report. It was important to ensure that the CM is consistent with other relevant IEA base documents, in particular the Operating Procedure *IEA Triennial Congress.” It is also important for (the CM to specify general guidance for 1) communication between the locally based organizing committee and the IEA Executive, 2) the content management of the Triennial Congress, and (3) introduction of a clear management process. A preliminary version of the CM was then internally reviewed to improve the usability and refine the language.

[22] The principal contributor to this section was Elina Parviainen, Chair of the Development and Promotion Standing Committee.

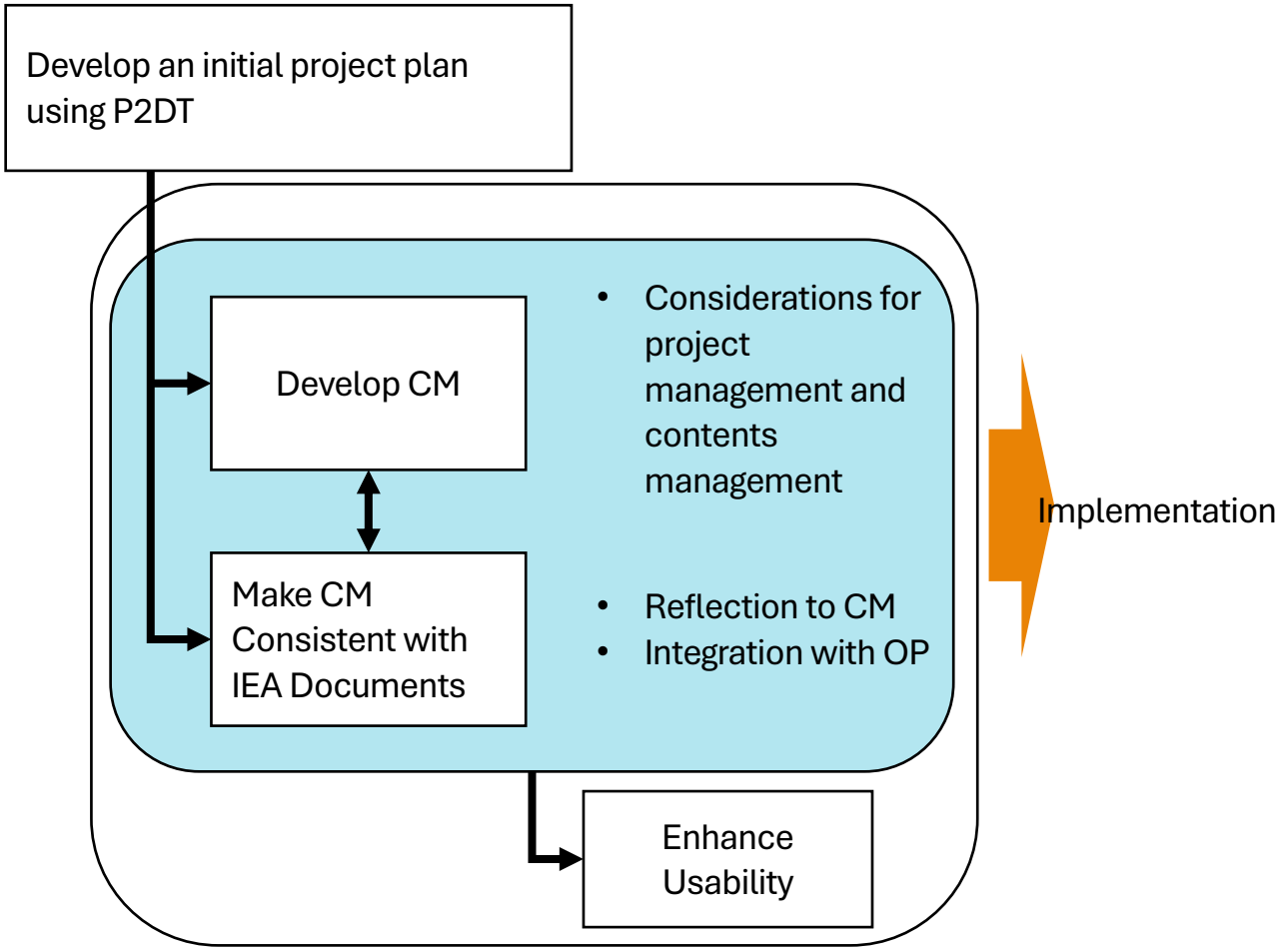


Figure 11.1 Initial Development Process of the Congress Model

The CM is intended to be a living process, continually improving as needs change over time and new experiences are acquired.

- For instance, the relevant operating procedure (i.e., OP-IEA Triennial Congress) did not anticipate the need for hybrid or fully remote Congresses. COVID-19 changed the situation completely, and the CM needed to include relevant considerations.
  Every Triennial Congress learns lessons. Those lessons need to be included in the CM.

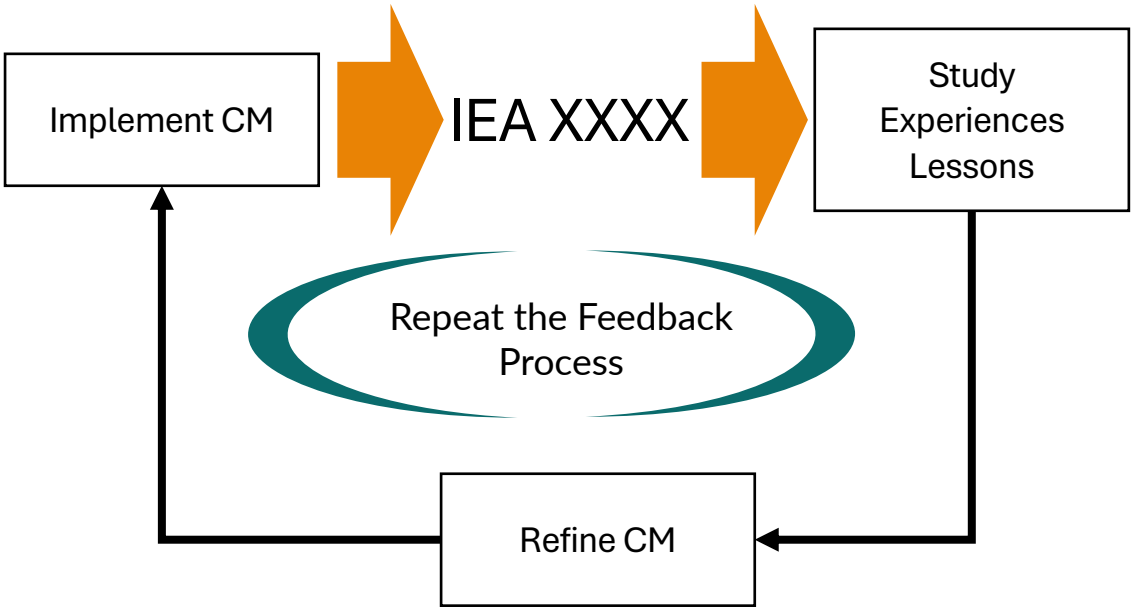


Figure 11.2 Refinement Process of the Congress Model

Identifying needs regarding management of the IEA Triennial Congress

Following preliminary discussions the following needs were identified:

- The management process of the Triennial Congress should be more clearly described so that both the local organizing committee and the IEA Executive share an understanding of what will be done by whom. The OP-IEA Triennial Congress was the only procedure specified for the Triennial Congresses, but it only partially covers the actual management processes.
- Communication between the EC and Organizing Committee (OC) needs to be more frequent than prescribed in the operating procedures. These only require a report at the Executive and Council meetings (twice a year in total)
- The content management process should be improved to ensure scientific and technical quality.
- Financial management should be improved to reduce risks for both the IEA and the hosting organizations.
- The needs of the Executive Committee (EC) should be regularly communicated and provide support to the organizing committee as needed.

It was therefore proposed that the:

- EC and the Host Society Organizing Committee (HS/OC) co-create the Congress.
- EC communicates more closely with the HS/OC.
- EC explores new areas for HFE to develop collaboration (e.g., with other non-HFE disciplines).
- EC explores new areas for IEA application (e.g., introduce new HFE disciplines).
- EC initiates projects and presents them at the Triennial Congress (i.e., special sessions)
- … (Considering other contributions is a necessary thing for the EC to do >> for developing the future of HFE and IEA.)

Main stakeholder relationships (Congress Management)
A clarification of the stakeholders engaged in the Triennial Congress is important for designing a better Triennial Congress.

Table 11.1 Stakeholders engaged in the Triennial Congress and their relationships

	OC/HS	EC	TC	FS	Sponsors	Congress Participants	Publisher
OC/HS	internal collaboration	✓ report ✓ provide capitation fee and bonus	✓ request assistance	--	✓ request sponsorship ✓ provide privileges	✓ provide various opportunities ✓ events	✓ assistance
EC	✓ assistance ✓ propose EC sessions ✓ suggest keynotes	internal collaboration	✓ request assistance (e.g., paper review)	--	--	--	✓ assistance (STPC)
TC	✓ proposes sessions ✓ paper review	✓ assistance (sessions, paper review, etc.)	--	--	--	--	--
FS	--	--	--	--	--	--	--
Sponsors	✓ provide funds	--	--	--	--		
Congress Participants	✓ feedback	✓ feedback	--	--	--	--	--
Publisher	--	--	--	--	--	✓ proceedings ✓ journals	--

It is also important to clearly define the stakeholders engaged in the development of the CM, on the level of both groups and individuals.

Table 11.2. Main stakeholder groups engaged in the development of the Congress Model and their relationships

To / From	CM Core Team	Officers	EC Chairs	OC/HS	FS
CM Core Team	Internal collaboration Draft CM Develop digital CM Communicate	Report request review	Request for review	Request trial application of CM	Introduce CM (e.g., workshop)
Officers	Review CM and provide advice Provides information Provides administrative assistance	Internal collaboration	Request assistance	Request assistance Encourage use of CM	Request assistance
EC chairs	Provide advice	--	--	--	--

From \ To	CM Core Team	Officers	EC Chairs	OC/HS	FS
OC/HS	Provide advice through trial use of CM	Provide advice	--	--	--
FS	Provide advice	Provide advice	--	--	--

General benefits to stakeholders given by the CM

Meeting the needs of all stakeholders is expected to turn the Congresses into benefits for both the EC and the host society. Improved Triennial Congress organization will benefit congress participants ((e.g., researchers, students) as well as those who are influencing HFE or benefitting from HFE (e.g., government officers, sponsors).

11.1.4 Outcomes so far

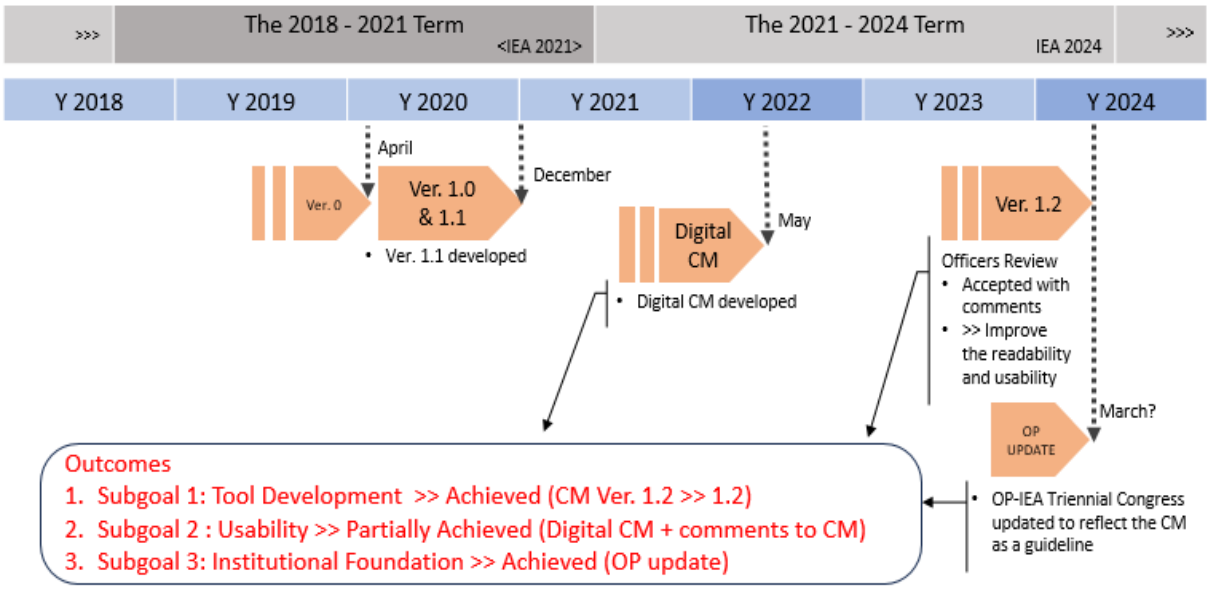


Figure 11.3 Chronological development of the CM

The latest version of the CM (i.e., Ver. 1.4) has four main chapters, additional notes, and six appendixes as listed below. It is downloadable from the IEA website member's area or from the IEA Secretariat:

Preface
Introduction
Chapter 2 Overall Project Process
Chapter 3 Important Considerations
3.1 Considerations for Project Management
3.2 Considerations for Content Management

Chapter 4 Project Management Process
4.1 Phase 1: Applying for the Congress
4.2 Phase 2: Organizing the Congress
4.3 Phase 3: Holding the Congress
4.4 Phase 4: Ending the Congress
Appendix A: Call for Proposals Package
Appendix B: Standard Agreements
Appendix C: Guidance for Congress Organizing Documents
Appendix D: Instruction Package for Drafting Triennial Congress Report

Chapter 3 discusses what should be considered in designing the contents of the Triennial Congress and how should it be managed. Chapter 4 specifies the project management process (PMP). There is an overriding PMP for managing the organization (=design) of Triennial Congresses and three other subsidiary PMPs. These four PMPs cover the whole process, which starts with the preparation for proposing a Triennial Congress and ends with the submission of the formal report (i.e., Congress Report).

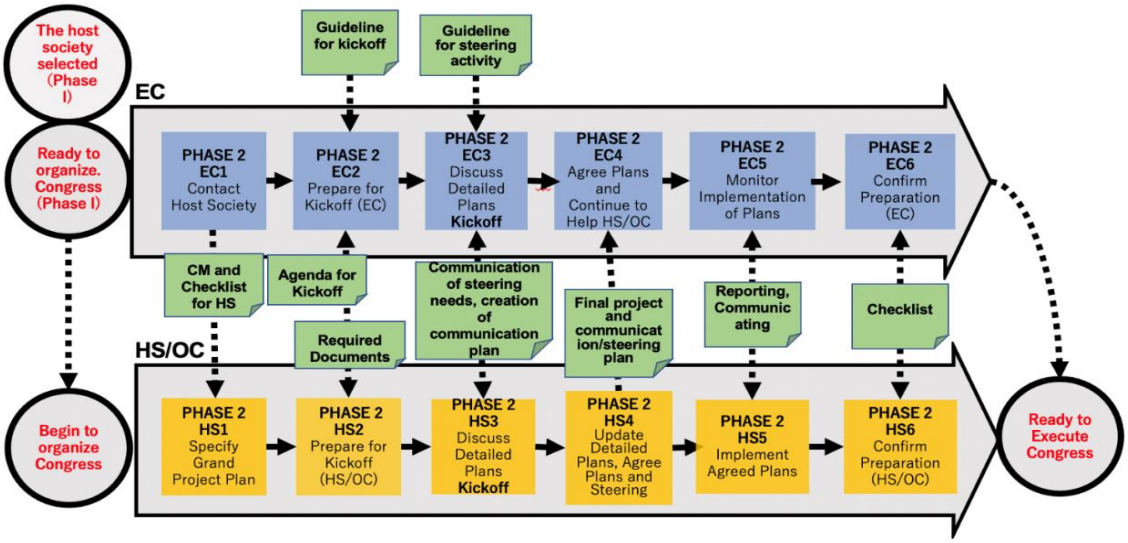


Figure 11.4. The Project Management Process (PMP) for Phase 2

(Organizing the Congress)

Future Activities
The figure below schematically shows suggestions for the future development (improvement) of the CM.

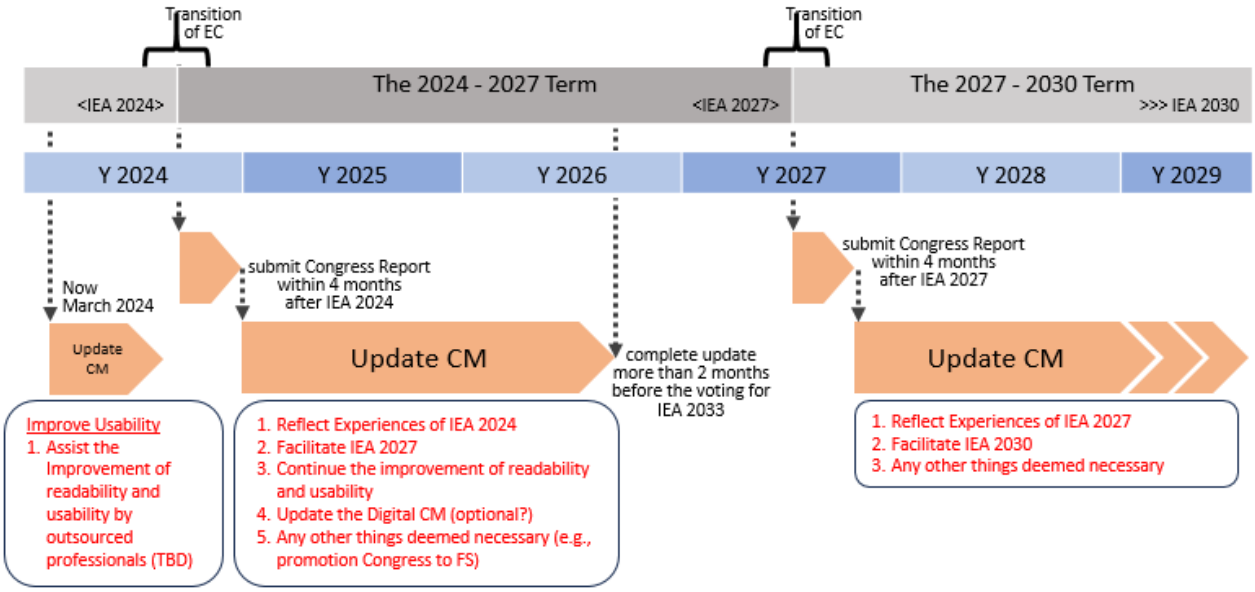


Figure 11.5. Future Activities (Suggestions)

11.2 Sustainable Operations Project[23]

This project was instigated by the incoming Vice President/Secretary General on taking up the role. It was termed "Business Model," as it was based on previous work with the title "Business Model Canvas" commenced by a previous Executive Committee. The documents related to the earlier project included lists of stakeholders, their relationships, and a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats). This was augmented with the results of "Communication and Collaboration Survey" undertaken by the previous Communications and Public Relations Standing Committee of Federated and Affiliated Societies and IEA Networks. The results were elaborated and presented as a project proposal at the 2022 Council meetings, where it was proposed to change the title to Sustainable Operations Model.

11.2.1 Initial project description (P²DT)

For the Executive Committee meeting in May 2023, the project was reformulated in accordance with the P²DT model with the following steps:
Step 1: Identify value-added topic: Make the IEA financially and administratively sustainable.
Step 2: Project details: Strategy document IEA: Reinforce the infrastructure of IEA (Strategy Point 6) To make the IEA more financially and administratively sustainable, the infrastructure must be reinforced. This was the result of the SWOT Analysis which identified Strengths, Weaknesses, Opportunities, and Threats
Step 3: Needs

- improve the IEA's financial base so that it is not as susceptible to large swings in income resulting from the success of IEA Congresses
- improve organizational issues that have hampered the effectiveness of the IEA

Steps 4/5: Identify Stakeholders and their relationships: This project step was already largely completed at that point of time.

[23] Principal author of Sections 11.2 to 11.4 was Maggie Graf, Vice President and Secretary General.

11.2.2 Survey of Executive Committee members 2022 and Council workshops 2023

It had been planned to hold a brainstorming workshop to collect proposed solutions for the open points at the following Executive meeting but, due to time constraints, this was not conducted. Instead, a survey of the Executive Committee was conducted by email on 16 sustainability issues taken from the threats, opportunities, and weaknesses of the SWOT analysis. The issues were divided into financial aspects and administrative aspects. The EC members were asked to make suggestions how these could be improved. It should be noted that not all Executive Committee members responded (less than half, making the sample size very small). Suggestions that were easily implemented were actioned.

The next step was to work with Council members to get ideas about how to resolve issues that could not be solved by the Executive Committee alone. This was done in four workshops at the Council meeting in 2023.

Workshop 1: Challenges and opportunities around membership in societies and recruiting and retaining early-career members

Take-homes for IEA:

- Encourage experience exchange between societies by providing platforms
- Show benefits of society membership
- Support university representatives where possible
- Generate more social media content and especially link HFE to common emergent themes/hot topics such as AI, Future of Work, climate change.
- Continue to promote the discipline, the societies, the Technical Committees, and other relevant stakeholders globally through social media. This can be achieved by ongoing webinars, publications, and other events.
- Provide discounted rates for Congresses and special events. Create global networking possibilities.

Workshop 2: Society development strategies and engagement of (external) stakeholders

Take-homes for IEA:

- Encourage connections with the local decision-making members in each country. Provide good-practice examples and experience exchange.
- Organize seminars with local organizations at the direction of the regional networks to assist with understanding of the profession.
- Link to industry-sector organizations. Top-down push using international organizations.

Workshop 3: Promoting education

Take-homes for IEA:

- Encourage connections with the local decision-making members in each country: Provide good-practice examples and experience exchange.
- Organize seminars with local organizations at the direction of the regional networks to assist with understanding of the profession.
- Link to industry-sector organizations. Top-down push using international organizations.
- Library of reference materials and presentations.
- Ergonomics for kids (backpacks, workload, sleep, etc.)
- Permanent future task force.
- Provide suggested syllabus for different levels of training with keywords.

Workshop 4: Expectations about IEA activities
Take-homes for IEA (+ continue work with international organizations)

- National Ergonomics month (October): Could IEA lead on setting up a global national day for our profession (to have same impact as World Usability Day)?
- Facilitate a global approach to certification (common standards and protection against proliferation of certification schemes).
- Support involvement in high-profile incidents. IEA should be the coordinator in producing inputs into these high-profile incidents.
- Include in Triennial Report the rationale for why activities are being undertaken and what outcomes were achieved and are expected.
- Prepare package for new Council members about the IEA (include most-recent Triennial Report)

11.2.3 Implemented changes and recommendations for the future

Many of the suggestions made by the Council members are already part of the ongoing work of the IEA Executive Committee, the Technical Committees, and subcommittees. The issue here is more related to the dissemination of knowledge about IEA activities. The changes that have already be implemented. such as the establishment of co-chairs and the suggestions for the Standing Committee roles are included in the recommendations in Section 13.

The project is now closed but the documentation can be passed to the incoming Executive Committee, who may wish to take up more of the suggestions.

11.3 Corporate Image Project

During 2023 the Publications Co-chair of the Science, Technology and Practice Standing Committee proposed that the IEA public image would look more professional if there was a consistent appearance of all publications, documents, website, and other products of the organization (a Corporate Image or CI). The IEA Council meeting of 2023 approved the proposal and budget. The project took six months to complete and was approved for implementation by the IEA Executive in early 2024. The delivered package included

- A guidance booklet.
- The Lato font (readily available from various sources on the internet for free.)
- Logos for various purposes in a range of six colors (black, white, dark turquoise, light turquoise, orange, yellow, and mixed dark turquoise/black), and five formats (.ai, .jpg, .png, .svg, .pdf).
- The purposes include for Federated and Affiliated Societies, endorsed congresses, endorsed societies, and corporate Sustaining Members.
- Templates for documents, letters, book covers, business cards, Powerpoint presentations, email signatures, and envelopes/folders.
- A pack of avatars and banners in various color combinations that can be used as headers and footers on documents, name-badges, pins, etc.

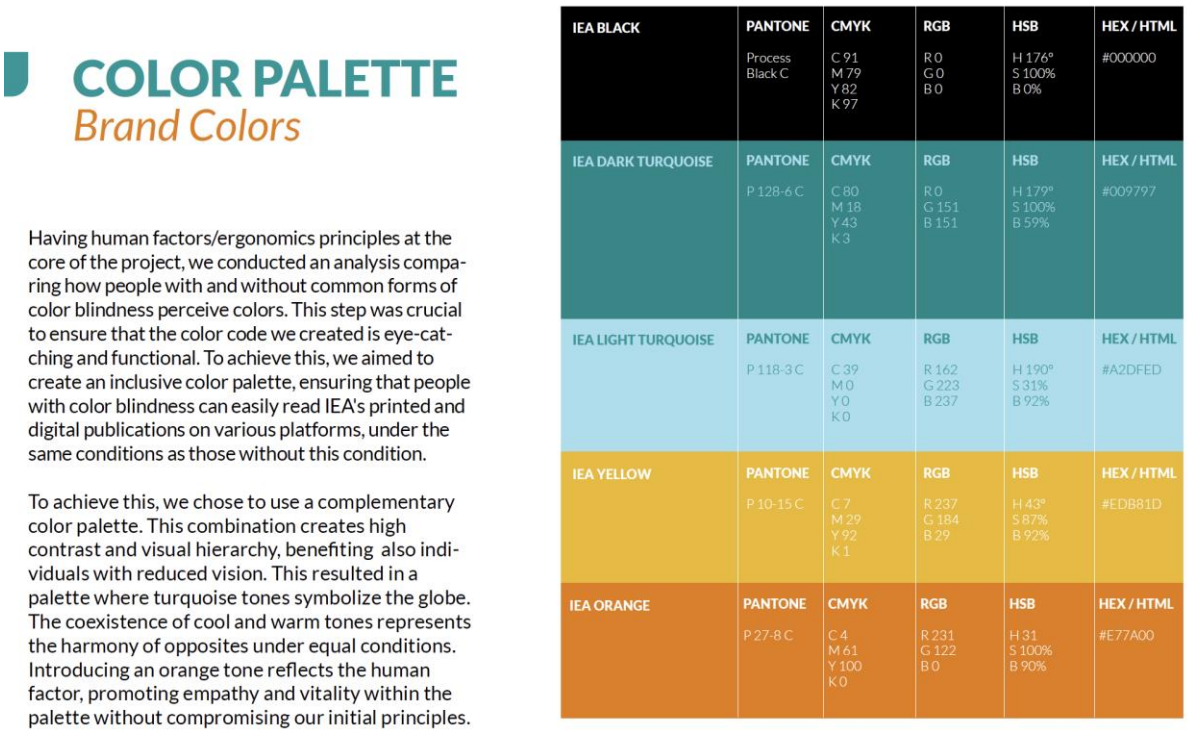


Figure 11.6 The IEA Corporate Image Color Palette

It was decided that the mixed-color logo (dark turquoise/black) should be used as the standard logo; however, depending on the background, other colors may be used. It is not permitted to change the appearance of the text or image in the logo.

All IEA products are now required to conform to the guidelines specified in the CI booklet, except for the IEA Website. The colors have been partially modified on the website and the font completely modified, however, a further modification would require substantial re-programming of the IEA website, and it was decided by the Officers to postpone further implementation of the CI to the website until the next major update, as it would involve substantial cost.

The IEA Triennial Report has been prepared using the new CI. The IEA Secretary-General would like to thank the project leaders and execution group for the helpful and pleasant communication during the project.

11.4 Update of Archives and By-laws and Review of Operating Procedures

A consequence of the introduction of the IEA Corporate Image was that all current operating procedures needed to be put onto the appropriate document format. This provided an excellent opportunity to check that all were up to date. One of the challenges for the Vice-President/Secretary General on taking up office was to find out which documents existed and where they could be found. A single archive did not exist, and there was some uncertainty about which documents were currently valid. The VPSG thanks the three past presidents who assisted her with research on this and provided documents. A

"Documents" area was established on the Members Area of the IEA website, and this currently contains the following folders for the use and information of Council members:

- Meeting preparations 2024
- By-laws and Operating Procedures
- IEA Strategy documents
- Council meeting minutes of all meetings since the beginning of the IEA
- Annual financial reports (still not complete)
- Hosting the IEA Triennial Congress (the Congress Model described in Section 11.1)
- Application forms for membership and endorsement application forms
- Information about professional certification and IEA endorsement of certification bodies
- Agreements with partner organizations (MOUs)
- Agreements with Springer about publishing scientific reports and books
- All Triennial Reports
- Resources
- Miscellaneous
- Archives of old documents

This research revealed that the IEA had originally had "Rules," but these were converted earlier this century into By-laws and Operating Procedures. During this process, some aspects of the rules were never migrated into an Operating Procedure; notably the rules governing Standing Committees. A draft proposal was therefore prepared for decision at the 2024 Council meeting. The new draft Operating Procedure is complemented by a document with recommendations for the incoming President about the roles and responsibilities of the various committee members. It is intended that this be updated with the experiences of each outgoing Executive Committee and serves to smooth the transition between Executive teams. These documents also start to formalize the process of appointing co-chairs as described above. One other operating procedure was deemed to be out of date and a draft revision will also be submitted for approval to the 2024 Council meeting (Supported Congresses). No applications were received for financial support of congresses during this triennial period.

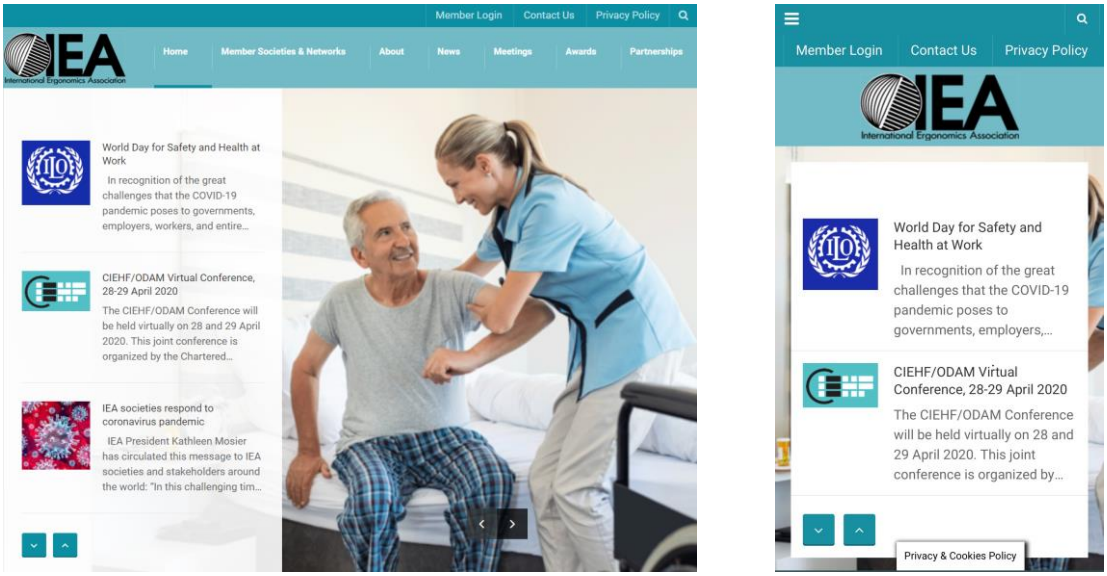
During the Executive Meeting of April 2024, where the above revisions to the Operating Procedures were discussed, it became obvious that there was inconsistency in the understanding of expressions in the By-laws amongst the Executive Committee members, and the decision was made to propose a revision to the Council meeting. The revision aims not only to improve the clarity of the expressions, but also to update several aspects, particularly relating to hybrid meetings, voting processes, and criteria for affiliated membership. Following further discussions amongst the Officers and Executive Committee a draft revision of the By-laws from 2017 was prepared for Council decision.

11.5 IEA Website[24]

11.5.1 Project Outline

The current website was launched on March 29, 2020.
The initial home screen for PC and mobile devices is shown below.

[24] The principal author of this section was Takashi Kawai, the ad hoc chair responsible for Information and Communication Technology.



Home for PC Home for mobile device

Figure 11.5.1. Initial IEA website home screen for PC and mobile devices

The basic technical details are listed below.

- PHP, Javascript, HTML5, mysql
- Apache server with nginx caching technology
- Weekly backup schedule
- Security measure by daily scan

The basic design concept is described below.

- Compact and proper information flow
- Navigation for easy searching
- Responsive web frame with a sticky menu
- Simpler HOME design for both PC and mobile device

The Information and Communication Technology Ad Hoc Committee from 2021 to 2024 is as follows

- Takashi Kawai (Chair)
- Maggie Graf (VPSG)
- Aleksandra Gamper (Administrator)
- Kian Leong (Web Developer)

In addition, the committee collaborated with the Development and Promotion Standing Committee and the Corporate Image team.

The roles of this committee and the IEA Website are the following four points.

- To manage ICT as IEA Infrastructure
- To facilitate the use of the IEA website
- To support collaboration on IEA projects
- To disseminate IEA activities and brand image

For the above, the two main projects that have been promoted are as follows

- Website redesign project
- Website enhancement project

11.5.2 Website Redesign Project

After its initial launch, the IEA Website has been continuously redesigned.
Below are the home screens of the 2023 and 2024 versions of the website.
In 2023, a carousel-type animated display was introduced to reduce scrolling and improve visibility.

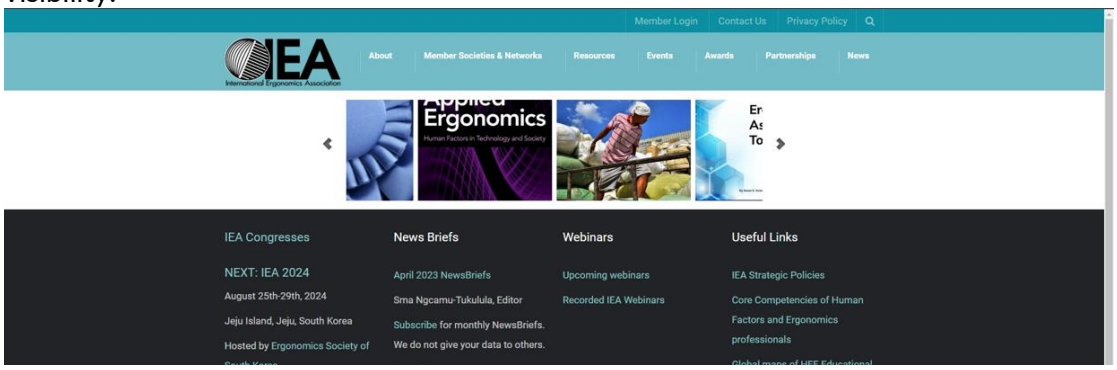


Figure 11.5.2. Updated IEA home screen with carousel-type animated display

In 2024, the logo and colors were changed in collaboration with the Corporate Image team.

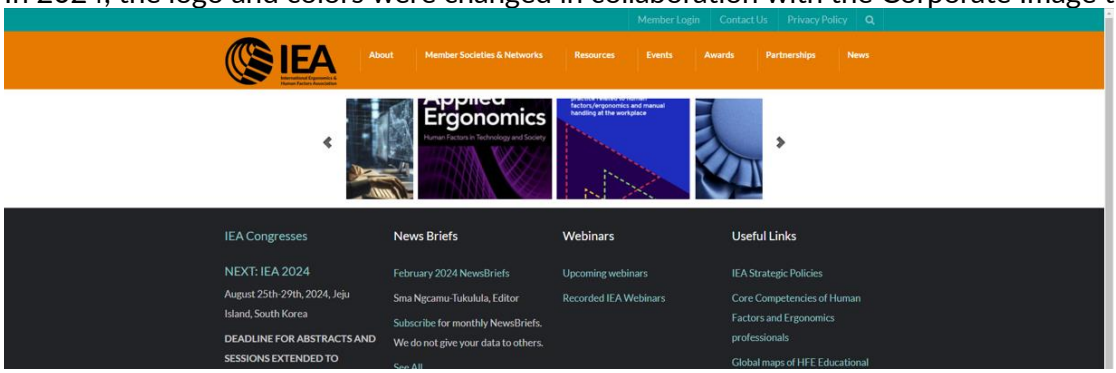


Figure 11.5.3 Updated IEA home screen with Corporate Image colors

11.5.3 Website Enhancement Project

In terms of functional enhancements, the usability of the members' area has been improved.
Shown below is the current document-sharing screen of the members' area.
Compared to the previous version, the visibility of file structure and types are easier to understand.

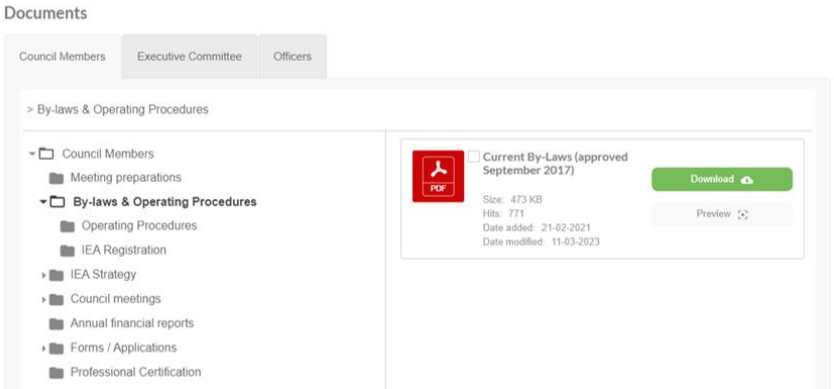


Figure 11.5.4 Document-sharing screen of members' area

In addition, by using an external cloud service, the ability to online vote from the members' area was implemented. This uses Survey Monkey's functions to anonymize, vote, and tally votes in a remote environment, and has been in actual use since the Council meeting of October 18, 2023. Below is an overview of the system.

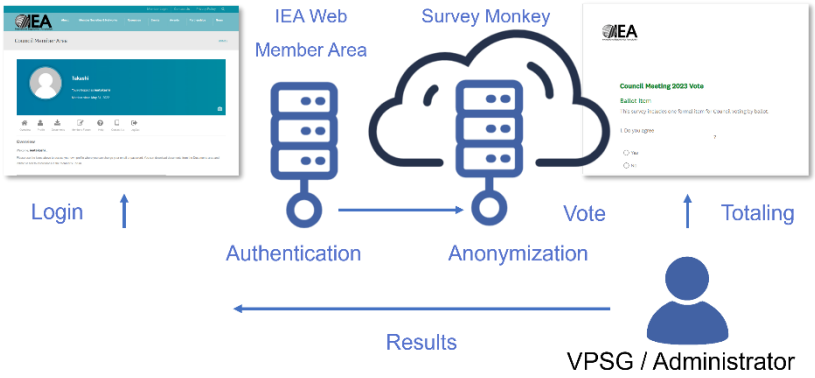


Figure 11.5.5. Overview of online voting system

11.5.4 Summary

This section outlines the three-year project of the IEA website; at the EC meeting on March 18, 2024, the following points were made

- The redesign in collaboration with the Corporate Image team is still ongoing.
- The enhancement of the member area requires further improvements in the convenience of file sharing.
- The electronic voting procedure is supported in the By-laws.

In addition, future issues include the enhancement of linkages with IEA2024, as well as with webinars and social networking sites.

12 Future focus of HFE[25]

12.1.1 Aims

Since the Future of Work was established as an ad hoc Committee there were no formal aims or directives from the IEA By-laws. Nevertheless, the aims of the Future of Work Ad-Hoc Committee align clearly with Goal 7 "Maintain a Future Focus for EHF" and specifically within Goal 7 that the "IEA must be several steps ahead of the trends, issues, challenges, and unanticipated events that will need to be addressed by the EHF systems approach" and to "collaborate with the ILO to provide guidance on EHF in future work system development and maintenance".

We were invited to develop our own aims in consultation with the two previous chairs of the Task Force, Juan Carlos Hiba and Klaus Zink. The previous chairs had recommended establishing regional observatories in Ergonomics/Human Factors (EHF) that would continually research emerging trends in the world of work and how EHF should respond to these trends. The current Chair and Co-chair incorporated this proposal into the aims of the Future of Work Ad-Hoc Committee 2021-2024 as follows:

- Establish a Task Force with regional representatives that would develop regional observatories;
- Host a webinar series by prominent EHF community members and emerging EHF community members with regional representation (emerging from the regional observatories);
- Host a webinar series by prominent EHF industry stakeholders (e.g., ILO, EU Beyond Work, etc.);
- Consolidate the webinar presentations into short opinion pieces for discussion at regional conferences;
- Produce a manuscript for Special Issue publication.

12.1.2 Overview

After the initial regional consultations with the prominent Federated Societies and regional networks, the idea of regional observatories was deemed not feasible. Only one region, North America, nominated a regional representative, and other regions either did not respond or indicated that they could not identify a representative that was willing to take on this role. As a consequence, we decided to go directly through contacts in Federated Societies to re-envision the webinar series as a set of talks titled "The Future of Work from Around the World," with two speakers per webinar (one established/prominent HFE community member and one new/emerging HFE community member). To date we have hosted 15 webinars in this webinar series ending June 2024. We have also held two webinars on artificial intelligence, which have augmented the regional webinars. Initial consultations with important international HFE stakeholders proved unsuccessful due to a lack of sustained response from these stakeholders. As a consequence, and due to a demand from Federated Societies that had not yet been heard, we extended the "The Future of Work from Around the World" webinar series into 2024. The first eight webinars were compiled into a discussion document that was presented at the HWWE/ACED/BRICS+ conference in Mumbai in December 2023. This discussion document will appear in the

[25] The principal contributor to this chapter was Andrew Thatcher, Chair of the Ad Hoc Committee for the Future of Work.

IEA2024 Congress proceedings. In addition, a roundtable discussion was held at the ULAERGO/SOCHERGO conference in October 2023, two roundtable discussions were held with Ergonomics Society of South Africa, ESSA, in March 2024, and a symposium with all the webinar speakers will be hosted at the IEA2024 Triennial Congress. Finally, preparations are being made to submit a manuscript to the Special Issue of Applied Ergonomics on "EHF for a Sustainable, Resilient, Human-Centered Future" which is due on 31 August 2024.

"The Future of Work from Around the World" webinar series

The summary statistics for the 15 webinars in "The Future of Work from Around the World" webinar series are listed below. In order to better understand attendance patterns, we also recorded the standardized time (standardized to UTC/GMT) and the day of the week together with registration numbers and attendance numbers. Regrettably we don't have attendance numbers for the first two webinars held in 2022 as this information had been deleted from the Zoom platform by the time we had decided to collect this information. All webinars were uploaded to the IEA's YouTube channel and the number of views as of 7 July 2024 have been recorded (obviously this is not a static number and may have increased by the time the IEA report has been fully compiled). Between 58% and 28% of registrants actually attended and the optimal time appears to be either 10h00 or 11h00 (UTC) on either a Tuesday, Wednesday, or Thursday. The webinar speakers represented 19 countries (18 Federated Societies and 1 country that does not yet have an HFE society (although that presenter was a member of a Federated Society in another region), and the distribution is graphically represented in the figure below.

Table 12.1 "The Future of Work from Around the World" webinar series

	Date	Country/ies	Time (UTC/GMT)	Day	Attendee N	Registrat. N	YouTube views
1	17/08/2022	Australia / New Zealand	08h00	Wed	--	--	255
2	02/12/2022	China	09h00	Fri	--	--	456
3	16/02/2023	Philippines / Singapore	11h00	Thur	44	108	267
4	15/03/2023	Finland	13h00	Wed	23	62	149
5	24/04/2023	Germany	09h30	Mon	28	100	142
6	10/05/2023	South Africa / Ghana	10h00	Wed	42	72	113
7	29/08/2023	United Kingdom	11h00	Tues	50	124	131
8	05/09/2023	South Korea	09h00	Tues	14	43	70
9	28/09/2023	India	13h00	Thur	38	100	104
10	31/10/2023	Brazil	13h00	Tues	19	59	69
11	16/11/2023	United States	15h00	Thur	22	54	56
12	28/02/2024	Japan	09h30	Wed	14	39	121
13	17/04/2024	France	13h00	Wed	42	126	83
14	15/05/2024	Colombia	14h00	Wed	52	166	57
15	18/06/2024	Poland / Bulgaria	10h00	Tues	12	--	58

In the table below we have listed the speakers, the URL to the YouTube recording, and the key highlights from each webinar. Although there are obvious commonalities between regions (e.g., the role of technology in both enhancing and restricting work opportunities) there is also an obvious Global North/Global South divide in the challenges emerging from the future of work. The Global North is typified (and we are generalizing here) by skills shortages emerging from aging populations and the fast pace of technological change. These are being addressed through more technological advancements (e.g., AI, automation, robotics, exoskeletons), which challenge the human-technology integration. In the Global South the situation is markedly different (and again we generalize) with a young, growing, unskilled population that is increasingly turning to informal work that has poor labor protection and conditions where it is difficult to provide HFE support at a reasonable cost. Both these situations result in skills deficits and political decisions that prevent the easy transfer of personnel and skills (e.g., protectionism, existing social support mechanisms).

Table 12.2 "The Future of Work from Around the World" webinar series speakers and key points

	Speakers (Federated Society)	Key points
1	Tim Bentley (HFESA) Nicola Green (HFESNZ)	• Automation of routinized, repetitive work • Accommodating/supporting an aging workforce • Remote/distance work including telehealth https://www.youtube.com/watch?v=W-XEI_h08Vg&t=2726s
2	Wei Zhang (CES) Liang Ma (CES)	• e-Commerce, delivery services, and gig work • Challenges to health care, due to aging population https://www.youtube.com/watch?v=XSnvugEQKBg
3	Rosemary Seva (HFESP) Shanqing Yin (HFESS)	• High rates of emigration of skilled employees (Philippines) • High need for skills in disaster management and preparation (Philippines) • High rates of skilled immigration due to small population (Singapore) • Automation to deal with skills shortages (Singapore) https://www.youtube.com/watch?v=mOwMxybZQDU&t=20s
4	Jari Kaivo-Oja (NES) Art Reiman (NES)	• Smart manufacturing systems for global expert • Innovating in a climate of HR/OSH is seen as restrictive https://www.youtube.com/watch?v=SCOMryFYj5w
5	Verena Nitsch (GfA) Anita Tisch (GfA)	• Worker displacement due to automation, AI, or technology • Managing work performed at a distance • Integrating unskilled immigrants into workforces https://www.youtube.com/watch?v=5ZqMsqVWTmo
6	Andrew Todd (ESSA) Augustine Acquah (HFES)	• Growing population, low skills, high unemployment • Predominance of informal work with little formal protections • Low technology adoption due to unreliable energy supplies https://www.youtube.com/watch?v=Lk7rM4YinwQ

	Speakers (Federated Society)	Key points
7	Nigel Heaton (CIEHF) Rob Becker (CIEHF)	• Skills gaps in critical sectors (e.g., health care) being filled by AI, automation, and robotics • Skills gaps in lower-paying sectors more difficult to fill https://www.youtube.com/watch?v=D4S_irU5b_A
8	Taezoon Park (ESK) Hong-In Chen (ESK)	• Aging population/low birth rate, and immigration is controversial • Exoskeletons and robotics (cobots) to support aging workforce https://www.youtube.com/watch?v=4ebuZEXrOhg
9	Somnath Gangopadhyay (ISE) Urmi Salve (ISE)	• Informal work is huge and expanding, but little understanding of how to support small, informal businesses • High rates of MSDs and MMH injuries • Need for low-cost interventions https://www.youtube.com/watch?v=Ee4zhPGAQU0
10	Daniel Braatz (ABERGO) Paulo Oliveira (ABERGO)	• 50% Informal work, 50% formal work • High proportion of younger people • High rates of internal and external migration causing skills "holes" https://www.youtube.com/watch?v=1u6nztmJ8eM&list=PLWSizg6-Bdu7y6Cy56fluSKyCG7Ujp_ks
11	Hongwei Hsiao (HFES) Gary Roth (HFES)	• High rates of worker replacement from technology, leading to casualisation and gig work • AI/robot/automation and human integration not properly understood https://www.youtube.com/watch?v=l8jOBNnJzPY (video was released late due to restrictions on some content).
12	Masaaki Mochimaru (JES) Yoshiko Yagi (JES)	• Human augmentation (exoskeletons, robotics), neuro-augmentation for an aging population • High drive towards optimal service delivery • Supporting work performed at a distance https://www.youtube.com/watch?v=jJnccrL6xsQ
13	Agnes Aublet-Cuvelier (SELF) Fabien Coutarel (SELF)	• Aging population, increasingly working from home • Isolated workers with poor HFE support to optimize work and prevent injuries https://www.youtube.com/watch?v=ZdeJoEdaKJY&t=31s
14	Yordan Rodriguez (HFES, SCE) Yaniel Torres (SCE, ACE)	• More than 50% informal work; but also significant portion of high skills/technology • High proportion of agricultural work • Need to support critical social systems (e.g., health care and education) https://www.youtube.com/watch?v=9Cmg4IdCNkE

	Speakers (Federated Society)	Key points
15	Beata Mgrugalska (PTErg) Elena Boatca (ErgoWork)	• High investment in technology and technological skills including AI, robotics, and cybersecurity • Good employment prospects, especially for people speaking local languages • Aging population and investment in retaining aged at work (flexible work policies and retirement ages, lifelong learning, etc.) https://www.youtube.com/watch?v=_Y026zhBGoA

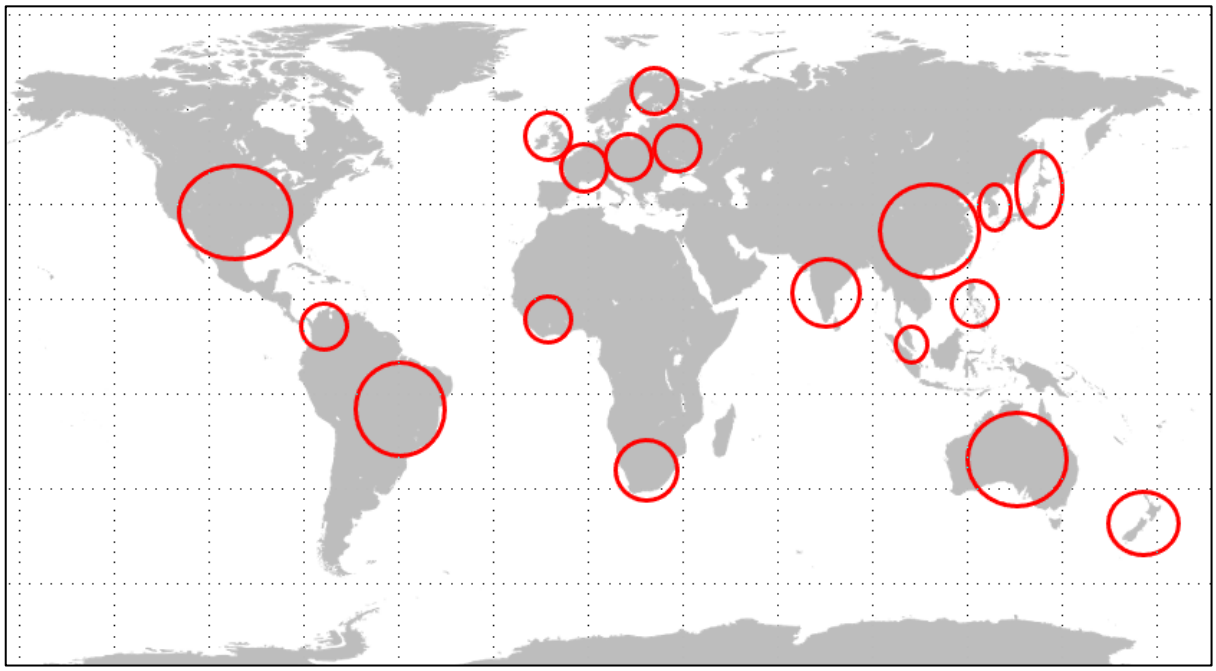


Figure 12.1 Geographical regions represented in the "The Future of Work from Around the World" webinar series

What is glaringly absent from these key points is a consistent acknowledgment of the challenges arising from climate change (although they are implied in the challenges arising from disaster management in the Philippines, the lack of secure energy provision across Africa, internal migration in Brazil, and immigration into Europe). Most keypoints emphasize emerging technologies to address human limitations without considering our inability to live within the limits of natural resources as a human limitation.

We have also been experimenting with offering continuing professional development (CPD) points for attendance at these webinars. In order to ensure that a registrant actively participated in the webinar, we send out a short survey after the webinar which respondents must answer correctly in order to be eligible for CPD points. The survey asks questions about the content of the webinar. We have experimented with the format of the questions and have tried multiple-choice questions and Yes/No type questions. Given the wide variety of languages (and the fact that participants may not be listening to the webinar in their home language) we are currently opting for the simple yes/no format of questions. We would like

to get this approved by the various certification bodies and will bring this to their attention at the meeting scheduled at the IEA 2024 Congress.

Artificial Intelligence webinars
The release of ChatGPT in late 2022 created a media frenzy as this freeware was tested and exploited by numerous people to demonstrate its power in using generative AI to complete a range of writing tasks from essays to theses to research articles. Given the high interest created by ChatGPT in AI systems, the Future of Work Ad Hoc Committee ran two webinars as shown in the table below. As can be seen, these two webinars generated high interest both at the webinar (more than double the number of attendees and registrants than at any of the "The Future of Work from Around the World" webinars) and after the webinar through YouTube views.

Table 12. 3 Artificial Intelligence webinars

	Date	Speakers	Time (UTC/GMT)	Day	Attendee N	Registrat. N	YouTube views
1	28/06/2023	Paul Salmon (Australia); HFESA	08h00	Wed	113	279	285
2	20/07/2023	Mica Endsley (United States); HFES	13h00	Thur	132	287	263

The webinar by Paul Salmon (https://www.youtube.com/watch?v=5scYIqIK8-U&t=6s) covered the issues arising from AI, as well as the yet-to-be-realized risks emerging from Artificial General Intelligence. In particular AI threatens to both remove certain jobs and fundamentally change other jobs. (Up to 66% of jobs are either directly threatened with existence or from being made less meaningful.) The webinar also covered issues in the design of AI (especially the training sets used to build experience, which introduce biases). The webinar called for more EHF involvement in the design of AI systems.

The webinar by Mica Endsley (https://www.youtube.com/watch?v=Uu32ky_Z4yE) covered a range of issues in the design of human-AI teaming. The webinar described a range of biases and negative implications of current AI technology (including AI "hallucinations," perceptual limitations, biases in decision-making emerging from training sets, out-of-loop degradations, and the "lumberjack effect"). The webinar looked at the various ways in which HFE can contribute to better AI-human teaming. This included how to make AI decision-making (as well as training sets and AI biases) more transparent, protecting against confirmation bias, and supporting in-the-loop behavior, and emphasized the need for policy-guiding aspects such as explicit labeling of AI-generated content and decisions.

Presentations and panel discussions
Three panel discussions were held at local/regional conferences to discuss the future of work and HFE. The first panel discussion took place at the SOCHERGO/ULAERGO conference on 21 October 2023 in Santiago, Chile. The panelists were Jonathan Davy (South Africa), Nancy Black (Canada), and Matias Donoso (Chile) with the session being chaired by Andrew Thatcher (South Africa). The second discussion panel took place at an ESSA symposium on 18 March 2024 in Johannesburg, South Africa. The primary purpose of this panel was to engage with HFE stakeholders including Harold Gaze (South African Institute of Occupational Safety and Health), Caren du Preez (South African Institute of

Occupational Hygiene), Bulelwa Huna (Department of Employment and Labour), Norman Khoza (African Union Development Agency), and Simphiwe Mabhele (ILO, Africa). HFE was represented by Sma Ngcama-Tukulula (South Africa), Myung Hwan Yun (South Korea), and José Orlando Gomes (Brazil). The session was chaired by Andrew Thatcher (South Africa). The third panel discussion took place at an ESSA symposium on 22 March 2024 in Cape Town, South Africa. The panelists were José Orlando Gomes (Brazil), Anindya Ganguli (India), Shin'ichi Fukuzumi (Japan), Jonathan Davy (South Africa), Sma Ngcama-Tukulula (South Africa), and Myung Hwan Yun (South Korea). Once again, the session was chaired by Andrew Thatcher (South Africa).

The panellists listed a wide range of issues to consider, including the familiar issues of the impact of technology on work (especially AI) and the rise of new forms of work such as gig work, activity-based work, and remote work. In addition, given that the panel discussions took place in the Global South, there were extensive discussions about addressing HFE in informal work contexts and how to create decent work opportunities in financially constrained contexts. The emphasis for HFE was how to create human-centered, "smart" workers. New issues that arose during these panel discussions included the benefits of technology for people with physical impairments (and how to create inclusive workplaces generally), the importance of the need for worker protections to keep pace with technological innovations, and the importance of transformational leadership to enable the transition to decent work in the future.

Finally, a presentation was given at the HWWE/ACED/BRICS+ joint conference in Mumbai, India on 16 December 2023. The presentation was made by Andrew Thatcher and the title of the presentation was "Geography, politics and the future of work: Challenges for human factors and ergonomics from around the World." The presentation covered the content of the first 8 webinars from the "The Future of Work from Around the World" webinar series. The paper associated with the presentation will be published by Springer in the conference proceedings. The paper/presentation emphasized how the future of work in different parts of the world has been influenced by its geography and socio-political history while also recognizing several common threads such as migration (emigration/immigration), a technological emphasis, and a shortage of skills. The paper can be obtained from the conference proceedings or from Andrew Thatcher.

Special-Issue publication
As the webinar series draws to a close, preparations are underway to submit a manuscript to the Special Issue of Applied Ergonomics on "EHF for a Sustainable, Resilient, Human-Centered Future." The submissions for the Special Issue are due on 31 August 2024. The Special-Issue manuscript will be an extension of the HWWE/ACED/BRICS+ conference paper which will emphasise the geographical differences and similarities on the future of work and how HFE needs to prepare to meet these challenges. All presenters of "The Future of Work from Around the World" webinar series have been invited to contribute to the manuscript. Before the final submission of the manuscript an open symposium is planned with all the webinar speakers. This will be hosted at the IEA Congress in August 2024 (including all the webinar presenters who are able to attend the IEA2024 Congress). It will be an opportunity to fine-tune the manuscript as well as get final inputs from other attendees of the symposium who were not presenters.

12.1.3 Way forward

It is our contention that the natural lifespan of the Future of Work Ad Hoc Committee is coming to an end. We would like to suggest that Goal 7 of the IEA Policies is still of utmost

importance, but that this work would best be continued through a subcommittee of the Science, Technology, and Practice Standing Committee. In this way, the issue related to the future of work can be aligned with other forward-thinking work, such as the future of technology and the future of HFE. Further, the findings emerging from the Future of Work Ad Hoc Committee suggest that there is a need for the establishment of new IEA Technical Committees, such a Technical Committee on AI or AI-Human Teaming, especially given the clear evidence that AI will lead to significant changes in the way we work and live.

Articulation with the IEA

The table below gives a broad overview of how the activities of the Future of Work Ad-Hoc Committee articulated with the broader IEA Executive Committee and IEA Council. This is intended to show how the Future of Work Ad-Hoc Committee is working in conjunction with the other IEA structures to provide a cohesive message to our stakeholders.

Table 12.4 Main IEA stakeholder groups

Stakeholder Group	What is the stakeholder group's role within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• Project oversight • High-level stakeholder engagement	Influencer and expert
STP, PSE, & CPR	• Project facilitation support together with FoW • Guidance on topics • Promotion of webinars	Influencer, expert, and actor
Local Societies and Networks	• Lessons learned from local contexts • Identification of interested universities and experts • Participation in webinar promotion and topic development	Experts
Global Societies (HFES, SELF, CIEHF)	• Lessons learned from local contexts • Participation in webinar promotion and topic development	Experts
Regional Universities, Academics, and Professionals	• Provide local experts in FoW topics (i.e., what are the needs for science and practice) • Identify relevant experts for journal publication	Decision makers, experts, and actors

The following table gives more specific details of individuals who have supported the activities of the Future of Work Ad-Hoc Committee within the broader IEA "family." This is

intended to acknowledge those individuals who have provided the necessary support to enable the activities of the Future of Work Ad-Hoc Committee.

Table 12.4 Individual stakeholders

Stakeholder Group	What stakeholders are involved within the Project?	System actors/ experts/ decision-makers/ influencers
IEA Executive Committee	• Andrew Thatcher, Wei Zhang, Maggie Graf, Aleksandra Gamper	Influencers and experts
STP & PSE	• STP: Nancy Black, Rosemary Seva • PSE: Takeshi Ebara • CPR: Jonathan Davy, Sma Ngcamu-Tukulula	Influencers and actors
Local Societies and Networks	• HFESA, HFSENZ, CES, ESK, HFESS, ESSA, ABERGO, ISE, JES, GfA, NES, SCE, ErgoWork, PTErgo, HFESP	Experts
Global Societies	• SELF, CIEHF, HFES	Experts
Regional Universities, Academics, and Professionals	• Nicola Green, Tim Bentley, Shanqing Yin, Rosemary Seva, Wei Zhang, Liang Ma, Aarto Reiman, Jari Kaivo-Oja, Urmi Salve, Somnath Gangopadhyay, Anita Tisch, Verena Nitsch, Gary Roth, Hongwei Hsiao, Paulo Oliveira, Daniel Braatz, Taezoon Park Hong-in Cheng, Yoshiko Yagi, Andrew Todd, Augustine Acquah, Masaaki Mochimaru, Fabien Coutarel, Agnes Cuvelier, Yaniel Torres, Yordan Rodriguez, Rob Becker, Nigel Heaton, Beata Mrugalska, Maria-Elena Boatca	Decision makers, experts, and actors

Finally, the final table in the chapter shows how the stakeholders have supported one another to demonstrate how they both supported the activities of the IEA and how the IEA supported the activities of the stakeholders.

Table 12.5. Main stakeholders and their relationship to each other

From \ To	Executive Committee	Standing Committees (STP, PSE as Key Drivers)	IEA Network and Associated Societies	Local Universities	External Stakeholders
Executive Committee	Project oversight, webinar infrastructure	Identify future of work topics and potential speakers	Identify potential topics Identify relevant speakers Help promote webinars	Provide suggestions and framework for future of work through publication/s and discussion panels at local conferences	Develop shared frameworks for tackling future emergent problems
STP, PSE, CPR	Develop CPD accreditation CPR assists with promotion	Identify future topics to prepare profession through STP and PSE	Provide suggestions and oversight	Support for topic and professional development	
IEA Networks, Societies	Continually invite discussion of new and emerging topics that are contextually relevant		Continue discussions of the future of work through own society/network	STP supports work through TCs PSE supports work through accreditation bodies	Local, contextual needs and barriers identified
Local Universities and Professionals	Identify local needs that require teaching or research			Journal publication on the future of work	Local, contextual needs and barriers identified
External Stakeholders	Identify global trends				Outreach and engagement

13 Recommendations for the future

13.1 Project to take leading role in AI implementation

Artificial Intelligence (AI) system means a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.[26] AI applies new techniques and technologies to combine massive amounts of data with algorithms, software, and hardware, to gain new results and quickly understand and adjust to complex situations. It is undoubtedly among the most prominent and challenging scientific, technological, and regulatory topics today. Many foresee that AI has the potential to cause a comprehensive and disruptive change that is not limited to special applications or sectors, but overarching, affecting our private and working life. This development has started already and has already caused serious changes; for example, with the introduction of generative AI in the educational sector, or with diagnostic-assistance tools in the medical sector.

However, for successful implementation of AI it is crucial that requirements and perspectives from ergonomics/ human factors are considered during the whole process. This is especially relevant for applications of AI in high-risk areas; for example, when AI performs safety functions or when privacy issues are affected. Although the main driver for AI has traditionally been information technology and computer science, if human well-being and system performance are to be maintained, it is essential that the integration of ergonomics/human factors sciences are more strongly emphasized during future development. The aim is to ensure that AI supports, and not overly burdens or governs, the human being. Especially it should not cause accidents or social upheaval. This requires a human-oriented approach, taking aspects such as human-AI collaboration, explainable AI, and system transparency and pairing these with human supervision, acceptance, and other ergonomics/human factor aspects. In parallel, international, regional, and national standards and regulations are currently keeping pace with this rapid technological development of AI in various regions of the world.

The overall goal of this proposed project is to work towards safe and trustworthy AI implementation and to emphasize the role of ergonomics/human factors in this development. A first step should be the preparation of a white paper with the arguments of IEA in regard to AI development and how AI can and should be used in the world of work. The project will focus on participating, on taking a prominent role in these developments, and emphasizing the role of ergonomics/ human factors in protecting human well-being and system performance.

13.2 Project to address declining numbers in older Federated Societies

A key aspect of the implementation of the P^2DT approach to IEA activities has been the identification of value-added topics and subsequent needs for Federated Societies. Within

[26] Artificial Intelligence Act (Regulation (EU) 2024/1689)

this context, diminishing society numbers in some areas was identified as a value-added topic early in the term and was therefore added as a topic for a workshop at the Council meeting in Santiago, Chile. Although there has been pleasing growth in numbers in certain parts of the world, for example in societies in Latin America, there has been a decline in numbers in many other societies. An important outcome of the workshop was the identification of the need to further investigate the declining number of members in the older, and often larger, Federated Societies, particularly in North America, Asia, and Europe. The size of these societies and the important role that they have, and continue to, play within the IEA indicates that this should be a key priority for the future Executive Committee to continue to explore.

It is recommended, therefore, that the IEA explore in detail:

- trends in society numbers (including the nature of membership (lifetime/honorary, full, student, etc.)
- society membership trajectories
- engagement with stakeholders to understand reasons for growth or decline in numbers
- development of sustainable, collaborative, long-term growth projects

To do this it is essential for the IEA to have accurate information about society numbers and at the present time, less than half of the societies provide annual reports and, from the ones that are received, there are differences between the figures provided to the Treasurer and those to the Secretary General. The officers recommend that there should only be one report requested and it should be shared between Treasurer and Secretary General into one report from the FSs. A rule could be introduced that societies that have not provided reports are only given one vote at the Council meeting.

Several Federated Societies have initiated activities to try to attract and involve students and early-career members. The outcome of these activities should be followed, and successful endeavors publicized to other members. Although it has not been possible during this triennial period to establish a formal group of early-career members, the incorporation of such people into IEA activities is highly recommended.

13.3 Implementation of the Congress Model

The Executive Committee highly recommends the continuation of the development of the Congress Model described in Section 11.1. In particular, the following points should be considered:

- Continually improve the readability and usability of the document, particularly by external partners.
- Update with experiences from IEA2024 and IEA2027

13.4 Recommendations

13.5 from Executive Committee Chairs

Awards

It has been noticed by the current Executive that there is some confusion about qualifications for awards and, although the number of applications has increased, they tend to be from a small group of societies. It is suggested that the criteria be made clearer and the application process more user-friendly.

Communication and Public Relations

Contributions to **social media** websites should be either more frequent and diverse (with respect to the types of posts and the content) or fewer, with high quality and careful design. The CPR committee should potentially include students, researchers, and professionals with some expertise to better leverage the potential of social media. Alternatively, budgeting for and integrating a professional in design and social media into the CPR committee may assist with further professionalizing the IEA's presence on social media.

The new IEA **Corporate Image** needs to be implemented into all IEA activities (documents, presentations, website, etc.). This improves the professional image of IEA. In particular, the redesign of the website is still ongoing.

Several experts have recommended an update of the structure of IEAs **website** to better reflect user needs. Particularly, the website member area requires further improvements in the convenience of file sharing. A trial of an electronic voting procedure was conducted at the 2023 Council meeting, but it was found to be quite cumbersome to use the member area. Alternatives or improvements need to be found. In addition, enhancement of linkages with Triennial Congresses, webinars, and social networking sites are recommended.

Science, Technology, and Practice

Increased effort should be made to measure the value of IEA **event endorsement**. This issue may be due to advertising deficiencies or other causes.

Continued effort is recommended to operationalize the feedback from the **Technical Committees**. TCs want more frequent communication from STP executive, and on-boarding for new TC chairs should be improved. The limited resources of some TCs is of strategic concern, and more contact with inactive TCs is recommended (low responses to meeting requests, reports not received). Further, the findings emerging from the Future of Work Ad Hoc Committee suggest that there is a need for the establishment of new IEA Technical Committees such a Technical Committee on AI or AI-Human Teaming, especially given the clear evidence that AI will lead to significant changes in the way we work and live.

The organizing committee of IEA2024 (and those in the future) must be supported in their efforts to produce and **publish scientific papers** from the Congress. This is crucial to the success of future Triennial Congresses. The IEA publications are not well known to the Federated Society members. Some effort should go into publicizing them, particularly the "Ergonomics in a Nutshell" series.

There is some concern about the effort/reward balance of producing **webinars**, as participation is sometimes low. This may be due to very short times for publicity. Although some TCs (e.g., MSD) have been very active in producing webinars, encouraging other TCs to produce webinars will improve the content of the series. The trial to provide certification for participation should be continued but, become of the work involved, some automation of this process is recommended.

Professional Standards and Education

The education toolkit is not complete, and a number of societies have requested guidance on how to incorporate IEA core competencies into educational programs.
The collaborative project to improve the educational resources in Asia is ongoing but potentially very fruitful.

The maintenance of the educational map remains problematic in terms of the content. There is a need to have the cooperation of more Council members, Federated Societies, and Networks to register further institutions and keep the current information up to date. At the present time the registration of information on this map is performed manually by authorized personnel; however, a registration platform that would enable more efficient updating needs to be developed. Language translation support may be needed.

Future of Work Task Force

The future of work will continue to be an evolving topic (the future is always arriving), but the current ad hoc Chair is of the opinion that it doesn't make sense to make the topic a Standing Committee. Instead, it is recommended to integrate this work into the STP Committee, either as a project of the STP, or to be assigned to various TCs. The task force has identified four megatrends (i.e., technology, skills, informalization, climate change) that can form the basis of more detailed examinations for HFE. For example, these can be broken down into separate topics and assigned to TCs to develop white papers on the role of HFE (e.g., a white paper on HFE and automation, a white paper on HFE and artificial intelligence, a white paper on HFE and climate change, etc.). The Task Force also created a framework for systemically analyzing the important factors for the future of work. This can be used by federated societies and networks to analyze their own situation to identify the unique trends and opportunities for HFE that are specific to their individual context.

13.6 Standing Committee Roles and Composition

It is highly recommended that the practice of appointing a team of co-chairs be maintained. These should be composed of people from a variety of continents, either with regional co-chairs or people with responsibilities for tasks, as appropriate.

A guidance document, "Roles of IEA Standing Committees," was produced during this triennial term. It aims to serve as an introduction to the new Executive and summarizes the duties and requirements for Standing Committee chairs. It is highly recommended that the incoming Officers read the document, and that the President appoint people to these positions according to its recommendations. Once the team has been determined, each member should familiarize themselves with the document and their roles. This will make the transition to the new team smoother. The guidance document should be updated towards the end of the triennial period for the next Executive team. It is attached to this report as an Addendum.

In particular, the current organization of the Standing Committee for Communication and Public Relations does not guarantee that that **communication with IEA partners** is adequately supported. The new description of the roles of the Standing Committees may alleviate this issue but it is essential that a member of the Executive Committee oversees the activities of the people entrusted with these liaisons.

A similar issue exists in the **communication between Certification Bodies** and IEA Executive**.**

Several Federated Societies have developed certification systems or are in the process of doing so. In their annual reports they have expressed the need for more support from IEA. The current organization of the Standing Committee for Professional Standards and Education does not guarantee that that certification activities are adequately supported. The new description of the roles of the Standing Committees may alleviate this issue.

The newly created **ISO Advisory Board** is currently regarded as an Ad Hoc committee, but it is highly recommended that it is continued in the present form for the duration of the coming term, with no change of leadership. The role requires specialist knowledge, experience, and contacts and a disruption in the leadership could endanger IEA's status as a Category-A partner, which is strategically important.

The goal of maintaining a future focus is still of utmost importance to IEA, however, this work may be better continued through a subcommittee of the Science, Technology, and Practice Standing Committee rather than a separate ad hoc committee. In this way, it can be aligned with other forward-thinking TCs.

14 Appendices

14.1 IEA Executive Committee

OFFICERS

President *José Orlando Gomes, PhD* *Brazil* *Email: President@iea.cc*	*Vice President, Secretary General, Swiss Director* *Margaret Graf, Dr.Sc. Eur.Erg.* *Switzerland* *Email: VPSG@iea.cc*	*Vice President and Treasurer* *Thomas Alexander, PhD., Eur.Erg Germany* *VPTreas@iea.cc*

NON-VOTING MEMBERS OF THE IEA EXECUTIVE COMMITTEE

STANDING COMMITTEE CHAIRS

Communications and Public Relations (CPR) *Jonathan Davy, PhD,* *South Africa* *Email: cpr@iea.cc*	*Development and Promotion* *Elina Parviainen* *Finland* *Email: DPChair@iea.cc*	*International Development* *Anindya Ganguli Kumar, PhD.* *India* *Email: IDChair@iea.cc*
Professional Standards and Education *Takeshi Ebara, PhD* *Japan* *E-mail: PSEChair@iea.cc*	*Science, Technology, and Practice* *Nancy Black, PhD, CPE* *Canada* *Email: STPChair@iea.cc*	

AD HOC COMMITTEE CHAIRS

Past President, Awards Chair *Kathleen Mosier, PhD,* *USA* Email: PastPres@iea.cc	*IEA2024 Congress Chair* *Myung Hwan Yoon, PhD* *Korea* *Email:IEA2024@iea.cc*	*Strategic Development and Implementation* *Andrew Todd* *South Africa*
Future of Work Andrew Thatcher South Africa	**Information Technology** Takeshi Kawai Japan	**ISO Advisory Group** Shin'ichi Fukuzumi Japan

14.2 Past Officers

1961-1964:	*President*	*S. Forssman*
	Secretary-Treasurer	*E. Grandjean*
1964-1967:	*President*	*G. Lehman*
	Secretary-Treasurer	*E. Grandjean*
1967-1970:	*President*	*P. Ruffell-Smith*
	Secretary-Treasurer	*E. Grandjean*
1970-1973:	*President Secretary*	*B. Metz*
	General Treasurer	*F. Bonjer*
		J. de Jong
1973-1976:	*President Secretary*	*F. Bonjer*
	General Treasurer	*R. Sell*
		J. de Jong
1976-1979:	*President Secretary*	*A. Chapanis*
	General Treasurer	*R. Sell*
		H. Scholz
1979-1982:	*President Secretary*	*J. Rosner*
	General Treasurer	*H. Davis*
		H. Scholz

1982-1985:	*President*	*S. Sugiyama*
	Secretary General	*H. Davis*
	Treasurer	*J. Rutenfranz/B. Shackel*
1985-1988:	*President*	*H. Davis*
	Secretary General	*I. Kuorinka*
	Treasurer	*B. Shackel*
1988-1991:	*President*	*I. Kuorinka*
	Secretary General	*H. Hendrick*
	Treasurer	*B. Shackel*
1991-1994:	*President*	*H. Hendrick*
	Secretary General	*P. Rookmaaker*
	Treasurer	*I. Noy*
1994-1997:	*President*	*M. Helander*
	Secretary General	*P. Rookmaaker*
	Treasurer	*I. Noy*
1997-2000:	*President*	*I. Noy*
	Secretary General	*W. Karwowski*
	Treasurer	*K. Kogi*
2000-2003:	*President*	*W. Karwowski*
	Secretary General	*P. Falzon*
	Treasurer	*K. Kogi*
2003-2006:	*President*	*P. Falzon*
	Secretary General	*S. Bagnara*
	Treasurer	*K. Laughery*
2006-2009:	*President*	*D. Caple*
	Secretary General	*P. Carayon*
	Treasurer	*M. Chung*
2009-2012	*President*	*A. Imada*
	VP Secretary General	*E. Wang*
	VP Treasurer	*K. Zink*
2012-2015	*President*	*E. Wang*
	VP Secretary General	*M. Fraser*
	VP Treasurer	*Y. Fujita*

2015-2018	*President*	*Y. Fujita*
	VP Secretary General	*K. Mosier*
	VP Treasurer	*J.O. Gomes*
2018-2021	*President*	*K. Mosier*
	VP Secretary General	*S. Albolino*
	VP Treasurer	*J. O. Gomes*
2021-2024	*President*	*J. O. Gomes*
	VP Secretary General	*M. Graf*
	VP Treasurer	*T. Alexander*

14.3 Past IEA Triennial Congresses

1961	*Stockholm, Sweden*
1964	*Dortmund, Germany*
1967	*Birmingham, United Kingdom*
1970	*Strasbourg, France*
1973	*Amsterdam, The Netherlands*
1976	*College Park, Maryland, USA*
1979	*Warsaw, Poland*
1982	*Tokyo, Japan*
1985	*Bournemouth, United Kingdom*
1988	*Sydney, Australia*
1991	*Paris, France*
1994	*Toronto, Canada*
1997	*Tampere, Finland*
2000	*San Diego, California, USA*
2003	*Seoul, Republic of Korea*
2006	*Maastricht, Netherlands*
2009	*Beijing, China*
2012	*Recife, Brazil*
2015	*Melbourne, Australia*
2018	*Florence, Italy*
2021	*Held virtually; hosted by Canada*
2024	*Jeju Island, Korea*

14.4 Past Meetings of IEA Council

1964	*Dortmund, Germany*
1965	*Paris, France*
1967	*Birmingham, United Kingdom*
1967	*Brighton, United Kingdom*
1969	*Noordwijk, The Netherlands*
1970	*Strasbourg, France*
1971	*Brussels, Belgium*
1972	*Schipol, The Netherlands*
1973	*Amsterdam, The Netherlands*
1974	*Amsterdam, The Netherlands*
1975	*Dortmund, Germany*
1976	*College Park, Maryland, USA*
1977	*Hayes, USA*
1978	*Luxembourg and Munich, Germany*
1979	*Warsaw, Poland*
1980	*Bournemouth, United Kingdom*
1981	*Rochester, New York, USA*
1982	*Tokyo, Japan*
1983	*Turin, Italy*
1984	*Toronto, Canada*
1985	*Bournemouth, United Kingdom*
1986	*Vancouver, Canada*
1987	*Stuttgart, Germany*
1988	*Sydney, Australia*
1989	*Noordwijk, The Netherlands*
1990	*Kyoto, Japan*

1991	*Paris, France*
1992	*Berlin, Germany*
1993	*Warsaw, Poland*
1994	*Toronto, Canada*
1995	*Rio de Janeiro, Brazil*
1996	*Breckenridge, Colorado, USA*
1997	*Tampere, Finland*
1998	*Cape Town, South Africa*
1999	*Santorini, Greece*
2000	*San Diego, California, USA*
2001	*Florence, Italy*
2002	*Santiago, Chile*
2003	*Seoul, Republic of Korea*
2005	*Funchal, Madeira*
2005	*San Diego, California, USA*
2006	*Maastricht, Netherlands*
2007	*Boston, Massachusetts, USA*
2008	*Reykjavik, Iceland*
2009	*Beijing, China*
2010	*Brugge, Belgium*
2011	*Grahamstown, South Africa*
2012	*Recife, Brazil*
2013	*Paris, France*
2014	*Taipei, Taiwan*
2015	*Melbourne, Australia*
2016	*Medellín, Colombia*
2017	*Singapore*
2018	*Florence, Italy*
2019	*Helsingør, Denmark*
2020	*Held virtually*
2021	*Held virtually*
2022	*Delft, Netherlands*
2023	*Santiago, Chile*
2024	*Jeju Island, Korea*

15 Addendum: Roles of IEA Standing Committees

There are six IEA Standing Committees that have all been operating historically for more than two decades, with some brief exceptions. The formation of additional standing committees should be approved by the IEA Council.

Except for the Awards Committee, Standing Committee Chairs are chosen by the President of the IEA shortly after his/her election to office. Ideally this is done in consultation with the other Officers. He/she may ask member societies to nominate candidates based on the requirements for office (below) and then choose among them.

In the past, the committees were composed of no more than one person (the committee chair), but generally they are now expected to be a group of people, commissioned by the chair in consultation with the IEA President. The committee chairs are part of the IEA Executive, and the holder of these positions is expected to attend two executive committee meetings per year as well as the annual IEA Council Meeting and to report to the Officers on issues and questions arising from their activities. During the EC and Council meetings they report on the activities of the Standing Committee members. Otherwise, they act as liaison between the members of the Standing Committee and the IEA Officers.

General tasks:

All Executive Committee members are expected to assist in the preparation of the IEA Triennial Congress and the Triennial Report and to direct their work according to the mission and goals of the IEA. Additionally, they should:

- Ensure that information relating to the SCs on the IEA website is correct and up to date.
- Regularly provide short articles for the *NewsBriefs* on significant activities.
- In conducting their activities, implement the (strategic) policies of the IEA, as appropriate, and particularly to engage stakeholders and maintain a future focus for HFE.

First tasks:

1. The first task of all newly appointed Executive Committee members is to familiarize themselves with the work of the previous position holder and any ongoing tasks. The Triennial Report will help with this. The incoming President will discuss specific activities that he/she requires during the appointment process.
2. The Standing Committee Chair should then appoint committee members (called “Co-chairs”) in consultation with the IEA President. As appropriate, and where possible, these should come from diverse geographical regions (covering Africa, Asia, Europe, Latin America, North America, and Oceania). The Co-chairs should have appropriate qualifications to lead or coordinate subcommittees and have outstanding networking talents. Representatives from the IEA Networks are most appropriate, but not essential.

SCIENCE, TECHNOLOGY, and PRACTICE (STP)

Purpose

This committee promotes and coordinates the exchange of scientific and technical information at the international level. It coordinates the activities of the IEA Technical Committees (considered subcommittees of the STP Standing Committee), which offer a communication platform for members of Federated Societies with specific areas of interest.

Key committee for the IEA goal:

To promote the advancement of the science and practice of human factors/ergonomics at an international level.

Especially by

- *Setting up working groups and Technical Committees of volunteers on human factors/ergonomics topics.*
- *Promoting HFE science, technology, and practice (see IEA Strategic Policy)*

Roles

This committee should provide the following services for the IEA.

- Communication with and coordination of the IEA Technical Committees (TCs), including encouraging them to provide up-to-date information about their activities on the IEA website and for the *NewsBriefs*.
- Ensuring the scientific and technical quality of IEA publications.
- Reviewing applications for IEA endorsement of congresses and advising the Officers of the outcome of the review.
- Providing assistance and advice to the IEA Triennial Conference organizers in charge of the scientific and technical program components. This should involve promoting communication among the TCs and the organizing committee.
- Assisting in the organization of webinar speakers from TCs.

Requirements of chair (and co-chairs)

The people who head the STP should have a sound academic record in the field of HFE and be familiar with academic processes and procedures. Representation from diverse regions of the world is very important in this committee.

Suggested co-chair roles are:

- TC coordinator
- Publications
- Webinars/Events

PROFESSIONAL STANDARDS AND EDUCATION (PS&E)

Purpose

This committee compiles and disseminates information relevant to offerings in human factors/ergonomics at educational institutions, educational materials, including instructional methods, aids and standards.

Key committee for the IEA goal:

To promote the advancement of the science and practice of human factors/ergonomics at an international level.

Especially by

- *Promoting the dissemination of knowledge through educational programs and journals, supporting conferences, and stimulating local initiatives.*
- *Promoting HFE education, certification, and professional standards (see IEA Strategic Policy)*

Roles

This committee should provide the following services for the IEA:

- Develop guidelines and give advice on HFE syllabus development at different levels of education to academics from all regions of the world as required.
- Develop guidelines and give advice on HFE certification.
- Provide information to Federated Society members and interested external stakeholders on where HFE education programs exist and what level of education they offer.
- Support the International Development Committee in matters related to education and certification.
- Communicate with and coordinate between certification bodies.
- Organize sessions at the IEA Triennial Congress to encourage experience exchange regarding education, curriculum development, and certification.

Requirements of chair (and co-chairs)

The person who heads the PS&E should preferably be an academic or someone with a sound knowledge of HFE education. The person should be aware of at least some of the differences in education systems around the world and have subcommittee chairs with experience from different regions. It is necessary to have someone in the PS&E with experience and knowledge of HFE certification, but this person can be a subcommittee chair.

Three subcommittees have generally been established;

- Certification,
- Education and Resources, and
- Education in Industrially Developing Countries.

INTERNATIONAL DEVELOPMENT (ID)

Purpose

This committee promotes, coordinates, and implements activities, mainly but not exclusively in industrially developing countries, by supporting local and regional initiatives concerning research, development, training, and conferences.

Key committee for the IEA goal:

To stimulate enhanced contributions of the human factors/ergonomics discipline to global society.

Especially by

- Collaborating with and reinforcing IEA Networks (see IEA strategic policy)

Roles

This committee should provide the following services to the IEA:

- Coordinate with the IEA Networks to support the growth of the IEA into new countries and regions.
- Work with PS&E to support the development of HFE education programs, particularly in areas where HFE is relatively new as a discipline.
- Assist with the support of members from low- and middle-income countries to attend IEA Congresses and to further their HFE education.
- Organize sessions at the IEA Triennial Conference to showcase examples of HFE development around the world

Requirements of chair (and co-chairs)

The people who head the ID Committee should be able to work in a multicultural context and be interested in developing programs with other organizations. In this role it is important to work closely with the IEA Networks, and, logically, co-chairs should be distributed across major regions of the world.

DEVELOPMENT AND PROMOTION (DP)

Purpose

This committee develops and promotes effective communication and collaboration with partner organizations, particularly the host committees of the IEA Triennial Congresses. It explores the needs of Federated Societies and encourages interactions among them and the IEA.

Key committee for the IEA goal:

To promote the advancement of the science and practice of human factors/ergonomics at an international level.

Especially by

- *Collaborating with other international associations such as ILO, WHO, and ISO.*

Roles

This committee should provide the following services to the IEA:

- Ensure communication between the EC and the organizing committee of the IEA Triennial Congress.
- Provide a link between the international organizations with which the IEA has formal agreements and actively provide HFE input to their activities.
- Advise and support the EC to optimize the internal procedures of the IEA.
- Actively collect feedback from Federated Societies to advise the EC on their needs.
- Maintaining active two-way communication with Sustaining Members.

Requirements of chair (and co-chairs)

This will depend largely on the projects foreseen by the incoming President and the requirements of the upcoming IEA Triennial Congresses; however; the person must be able to work interculturally. Co-chairs should be determined by the task requirements, but someone or a subcommittee must be responsible for collaboration and coordination with the IEA Congress organizing committees (see also the OP – IEA Triennial Congress and the Congress Model). Co-chairs should also be assigned to work with IEA partners (ILO, WHO, and others) and stakeholders.

COMMUNICATION AND PUBLIC RELATIONS[27] (CPR)

Purpose

This committee develops and distributes information about IEA and member society activities over a variety of media including the IEA website, the *NewsBriefs*, and the social media channels.

Key committee for the IEA goal:

To develop effective communication (…) with Federated Societies.

Especially by

- *strengthening relationships with external partners (see IEA Strategic Policy)*

Roles

This committee should provide the following services to the IEA:

[27] Public relations is the practice of managing and disseminating information from an individual or an organization to the public in order to influence their perception.

- Provide regular information to Federated Society members and other stakeholders and interested members of the public on the activities of the IEA and its member societies.
- Ensure that the IEA Corporate Image is consistently used.
- Actively assist the organizing committee of IEA Triennial Congresses to publicize their events.
- Advise the EC of threats to the public image of the IEA and opportunities for positive promotion.
- Assist the VPSG with the management of the IEA Press, which serves as the publishing house of the IEA.

Requirements of chair (and co-chairs)

The head of CPR needs to be a good coordinator of activities. Some public relations expertise would be an advantage but is not essential. This group requires co-chairs for specific activities, such as the *NewsBriefs* editor, Social Media editor, website maintenance and early-career professionals.

AWARDS COMMITTEE

Key committee for the IEA goal:

This activity contributes to all IEA goals.

Roles

This committee should provide the following services to the IEA:

- Supervise the promotion of the IEA annual and triennial awards (e.g., website, *NewsBriefs*, social media platforms)
- Organize subcommittees for the evaluation of the various awards and ensure that their work is carried out to the highest professional standards.
- Inform recipients of awards and arrange for payments, certificates, etc., to be distributed to them.

Requirements of chair (and co-chairs)

The chair of the Awards committee is generally the Immediate Past President. Co-chairs may be appointed to head the evaluation of specific awards or other tasks.

Note:
From Spring 2023 Council approved the creation of an Advisory Group for Standardization (AGS), but the definitive format is not yet regulated. The head of the Advisory Board must be someone with considerable experience in working with ISO. The appointment will be made by the IEA President, in consultation with the EC. Until it is regulated in a permanent form, this committee will be regarded as an Ad Hoc Committee.