DRAFT STRATEGIC BUSINESS PLAN ISO/TC 159

EXECUTIVE SUMMARY

Ergonomics is the scientific discipline concerned with the understanding of the interactions among human and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance

Business Environment

The actual business environment of ergonomics:

- The origin of ergonomics is related to work systems and product design. However, now ergonomic design is used for everyday products used in the home and leisure environment (for example, mobile phones and computers). Ergonomics design is not limited to systems and products, but can also be applied to organizations, services, facilities and environments.

- The total market for products (including services, systems, facilities and environments) relevant for ISO/TC 159 cannot be quantified, because ergonomics is relevant to everything intended for human use or operation.

- The market need for ergonomics is changing, e.g with an aging population and the necessity to address the human rights of people with disabilities (UN Convention on the Rights of Persons with Disabilities).

- Since ergonomics increasingly concerns the concept of accessibility in its works, the range of human variation covered by the standard increases as well.

The benefits of standardization of ergonomics in the actual business environment are:

- to enhance health, safety and well-being of the users as well as the overall performance;

- to meet the requirements for ergonomic and efficient products under the conditions of free trade through the application of ergonomics standards;

- to improve the effectiveness and the efficiency of the design process;

- to improve the usability of products, services and facilities;

- to improve the accessibility of products, systems, services, environments and facilities;

- to provide guidance on type and importance of human-system risk in business and to improve the knowledge on human responses to organizations;

- to deliver a consistent set of ergonomic requirements as a reliable basis for a world-wide machine design;

- to make the world more accessible for elderly and disabled persons;

- to assist in promoting sustainability and social responsibility.

Priorities

Strategies for the development of standardization of Ergonomics are:

- modularization of type A-, B- and C-standards, with responsibility for the types A and B;

- parallelization of work items and organizational measures at ISO and CEN, in order to support the consistency of International and European standards and easier trade across the world;

- ergonomics in the field of new technologies;

- ergonomics across the borders of occupational work;

- ergonomics for people with special requirements with the goal to improve accessibility.

1. INTRODUCTION

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of ITU (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 164 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the International Standard.

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

2. BUSINESS ENVIRONMENT OF THE ISO/TC

2.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this ISO/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

ISO/TC 159 deals with products, systems, organizations, services, facilities and environments, which are used all over the world in a wide range of different areas.

Standardization in the field of ergonomics resulted from requirements to design work systems, work equipment, and products according to human characteristics in order to enhance the usability of these products and thus the productivity, health, safety and well-being of the operator or user. As a matter of fact, ISO standards, when dealing with health and safety aspects, mostly do so in order to improve products in a market oriented perspective. Nevertheless, items such as noise, vibrations, cold and heat stresses have been the subject matter of ISO standards aiming at health and safety benefits.

Ergonomic design, as represented in ergonomics standards, can enhance work life for many persons through the design of work systems and equipment and will improve accessibility e.g. for elderly persons and persons with disabilities. Ergonomic data and design principles are also applicable to the design of consumer products and living environments. Standardization thus has clear implications for enhancing the overall quality of life for individuals and populations. Since ergonomic principles, data and design are not only relevant to the design of work equipment, work systems or work environments, but also to consumer products for private use, equipment for leisure activities and non-work environments, ergonomic design following ergonomics standards can at the same time be regarded as a contribution to a more general approach to human engineering for the general quality of life. Standardization in the field of ergonomics thus has quite clear implications for the general and the work related level of quality of life. This effect of ergonomics standards has become increasingly large in our society as the percentage of older persons in the world's population increases and the social awareness of the human rights of persons with special requirements is enhanced.

Ergonomics does not only relate to products and systems, but also to organizations, services, facilities and environments. In addressing ergonomics requirements for all these applications, the knowledge about the importance of human-system performance in business can be widened.

The aim in designing for accessibility is to widen the target population, thus making products, systems, services, environments and facilities more accessible to more people, see ISO/TR 22411. The concept of accessibility can be applied to the design and evaluation of the services provided by an organization.

The ergonomic design of work environments (e.g. illumination, climate) is often regulated by national standards and contributes to worker comfort and safety. Due to ergonomic design of work environments the motivation of the workers will be increased and the occurrence of fatigue will be decreased for all parties involved in the production process.

Another economic benefit of the use of ISO/TC 159 standards is the expansion of the market of products and services. Applying ergonomics standards of accessible design to products and services makes them more convenient and easier to use for everyone including older persons and persons with disabilities, which obviously increases their potential number of customers.

An example of topical interest for the business management is the use of information technology in the field of administration and production. Due to the rapidly increased application of software in all fields of life, the software ergonomics is becoming of major importance also for the cost-benefit analysis. Ergonomically designed tools, as for example software, which have been adjusted to human capabilities and competences increase the efficiency of the users and reduce the process times for several tasks.

Furthermore, the efforts and expenditure for training can be obviously reduced by ergonomic design (i.e. qualified user guidance), especially in this highly innovative area, which is often characterized by rapid changes or adjustments of the systems. Thus, the staff can be employed more flexibly. As shown by these examples, it is impossible to quantify the economical benefits resulting from the application of the ISO/TC 159 standards in exact figures.

In the European Union there already exists a set of well accepted European standards for the implementation of ergonomic knowledge into the machines already in the design phases. They could be transformed to International standards to get a reliable set of global guidelines for ergonomics, which is desirable in times of globalization.

2.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the ISO/TC:

It is impossible to quantify the total market served by the products of ISO/TC 159 because of the wide range of applicability of these mainly general horizontal documents. One very important area for the application of ISO ergonomics standards is the whole machinery sector. The increased use of machinery and equipment (e.g. visual display terminals) is one of the key stages in the development of any country and there is now a wide spectrum of use in the whole world. Today machines/equipment are used for both, professional use in such key sectors as metal and wood working, plastics and paper, construction, agriculture and forestry as well as non-professional use in the home and garden. Indeed, a growing trend is the migration of machines/equipment intended for professional use into the non-professional sector.

The trade in both new and used machinery and equipment can be described as truly global with an increasing trend for multinational companies to manufacture in one continent for use around the world. In contrast, there is also a continuing growth in the manufacture and repair of machines in small and medium enterprises (SMEs) and it has been estimated that 90 % of employed persons work in SMEs.

It is impossible to quantify in any accurate way the total value of the global trade in machinery/equipment because the products of ISO/TC 159 influence the design and the usage of machinery produced for both professional and non-professional use including domestic and leisure purposes. These quantifications should be left to the various machinery sectors.

3. BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

Apart from the efficient usage of ergonomically designed products and work systems, the application of ISO/TC 159 standards contributes directly to the reduction of machinery accidents, respectively hazards. The direct result of this work is that if the methodology is followed by the designer of machinery there will be a related reduction in machinery accidents and hence the consequential reduction in pain and suffering to the individual and overall costs to society.

It is not possible to calculate the total cost of every severe machinery accident in the world but recent studies have shown that for a single accident, the total cost to the individual and to the society can be up to $ 1 million. Clearly any measure that can reduce the number of accidents will result in a saving in pain and injury to the individual and the overall costs to society.

Furthermore, when considering ergonomics positive effects occur in various areas. The hazards will be reduced e.g. in the field of work with visual display terminals or the design of control centres and the economic benefit will be achieved since e.g. the costs for workplace absence due to sickness are reduced and a higher efficiency is reached.

Besides the benefits regarding machinery and equipment based work, ergonomics standards can also improve work systems characterized by intellectual work. Mental workload can be reduced by applying ergonomics standards. Addressing accessibility issues, for example, taking a broader age span into account accommodates the increasing proportion of older people within the population and requires the designer to consider characteristics which are associated with increasing age. It might also serve specific subgroups, for example people with impaired hearing, those with cognitive impairment, and people who are already using assistive technologies or who might require individualized solutions or alternative means of access. It benefits society by the development of standards addressing accessibility in accordance with the UN Convention on the Rights of Persons with Disabilities.

4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Membership

Countries/ISO member bodies that are P- and O-members of the ISO committee

4.2 Analysis of the participation

All the ISO national members are entitled to participate in the work of ISO/TC 159 as P- or O-member. To participate in the activities of this ISO/TC, please contact the national standards organization in your country. Our P- and O-members nominate delegates for the TC and SC meetings and participate actively in meetings and ballot votings.

Except the ISO national members as mentioned in 4.1 the following parties are interested in the standardization process:

Category A-Liaison has been established with:

- European Association for the Co-ordination of Consumer Representation in Standardisation (ANEC);
- European Commission (EC);
- International Commission on Illumination (CIE)
- International Ergonomics Association (IEA);
- International Labour Organization (ILO);
- Small Business Standards (SBS);
- World Blind Union (WBU);
- World Health Organization (WHO).

NOTE: Category A: Organizations that make an effective contribution to the work of the technical committee or subcommittee for questions dealt with by this technical committee or subcommittee. Such organizations are given access to all relevant documentation and are invited to meetings. They may nominate experts to participate in a WG.

There is an imbalance of participation between developed countries, developing countries and countries with economies in transition. There is also an uneven geographical distribution of participating countries with few members from Africa, South- and Central-America.

5. OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

ISO/TC 159, through standardization and co-ordination of related activities, promotes the creation of working and living conditions, which fit the anatomical, physiological and psychological characteristics of human beings taking into account the physical, social and technical environment.

The main objectives are safety, health, well-being, efficiency, effectiveness and satisfaction. This work includes:

- basic standards related to fundamental characteristics of humans;

- functional standards related to human factors in the operation or use of equipment, processes, products or systems (preferably classified as standards for product groups, work systems and products);

- environmental standards related to the effects of physical factors of the environment on humans;

- standards for ergonomic test procedures and for processing ergonomic data.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

In order to reach these objectives ISO/TC 159 realizes the following strategy:

- The technical work is managed by the TC, its Working Group 2 and four Subcommittees (SC 1, SC 3, SC 4 and SC 5) with their Working Groups.

- The work programme and its extent are adjusted to the available resources, for example to the number and competences of the experts available.

- A project leader is appointed for the development of each project.

- A joint planning function of ISO/TC 159 and CEN/TC 122, *Ergonomics*, is established in accordance with the Vienna Agreement.

- European standards, mandated according to the EU machine directive, are adopted in parallel processing following the Vienna agreement to establish that knowledge internationally.

- A balance between those experts with scientific competence and those experienced in practice ensures that the contents of its standards are valid and usable.

- Those branches of industry, services and trade where ergonomics needs will expand or arise or identified.

- The committee makes use of electronic means of communication to an increasing degree. For example the document management system *ISO.Documents* is intensively used to distribute and file the documents on the ISO/TC server and the Sub-committees servers.

- ISO/TC 159 decides to review and to use more efficiently the liaisons with other committees that develop or developed standards with ergonomics specifications – sometimes in the past with insufficient consideration of accepted ergonomics data and/or principles. Therefore, basic standards in the field of ergonomics should be drafted by ISO/TC 159 only, which should also provide guidelines for their use.

- The committee elaborates and implements an appropriate structure for standardization in ergonomics and its applications.

- The consequences of ergonomics standards for existing laws, regulations and codes of practice are considered.

6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

ISO/TC 159 standards are mainly general guidance documents without direct requirements for individual products. Therefore, it is difficult to win new experts for the development of these horizontal standards from all parties that have a direct interest in the production, marketing and usage of products.

Against this background, further problems could arise in assuring the necessary financial support for continuing the work of the secretariats of the TC, the SCs and the WGs on the required level to manage the current work programme.

7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

Information on ISO online

The link below is to the TC's page on ISO's website:
ISO/TC 159 on ISO Online .

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Committee Manager, Chair, Date of creation, Scope, etc.),
- Contact details,
- Structure (Subcommittees and working groups),
- Liaisons,
- Meetings,
- Tools,
- Work programme (published standards and standards under development).

Reference information

Glossary of terms and abbreviations used in ISO/TC Business Plans

General information on the principles of ISO's technical work