DEUTSCHER FÖRDERVEREIN ZUR STÄRKUNG DER **FORSCHUNG** ZUR **NORMUNG** UND **STANDARDISIERUNG** E. V.

Report on indicators 2013

GERMAN STANDARDIZATION PANEL (DNP)

Research, politics and promotion of standardization

Supported by the German Society for the Promotion of Research on Standardization (FNS)

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COPY DEADLINE

2013-10-10

978-3-410-94537-6

GERMAN STANDARDIZATION PANEL 2013 – Report on indicators for the importance of standards and standardization activities of German companies based on the 2012 survey

Summary

The contribution which innovations provide for the competitiveness of businesses, economic growth and the solving of societal challenges is undisputed. Even though the importance of standards and their implementation as an inherent part of a comprehensive conception of innovation is evident, it has so far merely been proven on the basis of salient single case studies. A systematic analysis requires a detailed, reliable database. In particular, data which is collected regularly through surveys, so called panel data, is crucial for the exploration of the complex effects of standardization processes as well as the application of formal and informal standards to business success. In order to achieve these goals, the German Standardization Panel (DNP), was constituted in autumn 2012 by the German Society for the Promotion of Research on Standardization (FNS) and its members[1].

From the analysis of the data gained through the first survey in which over 300 companies participated, four key findings can be noted:

Formal standards and technical rules or specifications which official standardization organizations offer, pose the by far most important types of standardization for interviewed businesses. They are highly relevant for the innovation activities of companies, primarily in the product development process, but also for research and development activities. Furthermore, they facilitate market access for businesses and promote other business objectives, like unification and conformity with the law or else the fostering of legal security. As formal standards are only used by few companies as a marketing instrument for innovations, the untapped potential that lies here must be illustrated.

Company standards form the third most important type of standard and are assessed as more relevant than de-facto standards or standards of consortia. They are applied by the majority of participating businesses and primarily lower production costs and improve product safety. Consequently, the question arises in what way these company-internal documents relate to the formulation of formal standards.

The results indicate a certain discrepancy between the apparently remote significance of consortial standards for businesses on the one hand and their active participation in consortia on the other hand. Therefore, the process of standardization needs to be reviewed with regard to how it can be made more attractive and spare companies multiple commitments in various consortia.

1 Founding members are the DIN German Institute for Standardization, the DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE and the HARTING Technology Group.

Finally, from the high participation of service companies in the first survey, further potential for standardization in this area can be deduced. Equally, the great extent to which participant businesses in the services industry utilize formal standards and technical rules or specifications underlines the growing importance of service standardization. In comparison, this industry features a great number of companies which maintain a separate standardization department. This is emphasized by the assessment that formal standards have a great impact on business objectives.

The creation of an empirical basis for the exploration of the German landscape of standardization

Introduction

Innovations are commonly regarded as a source of growth and prosperity. If an idea develops into an effective market solution, many factors have contributed to this achievement. One of these factors is standardization. For a scientific analysis of how formal standards correlate and affect each other, panel data, so data which is gathered regularly, is crucial.

Inspired by an innovation survey[2] conceptualized by the European Commission in the early nineties, the German Standardization Panel (German: Deutsches Normungspanel, abbr. "DNP") is intended to generate a comprehensive empirical database which can be used for the exploration of central problems in innovation research.

Goals

The data generated by the German Standardization Panel is intended to be the basis for scientific research with regard to the standardization activities of companies and the implementation of formal standards.

2 The respective survey is the panel study of the Community Innovation Surveys (CIS) (see *http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/cis*), in which companies are interviewed repeatedly regarding their innovation activities, -problems and -achievements.

Additionally, the results of the survey offer the possibility of actively formulating strategies for European and international Standardization, in order to articulate corporate interests vis-à-vis the European Commission.

A further goal of the German Standardization Panel is to engage with current standardization policy issues in order to assess any steps taken in this field. Moreover, the panel shall help businesses, which so far haven't or have only marginally used formal standards, or else don't participate actively in the standardization process, to develop a sensitivity for the subject and motivate them to cooperate in such matters. Via the DNP, these compatible goals concerning Standardization research, -politics and -promotion shall be achieved.

Heuristic model

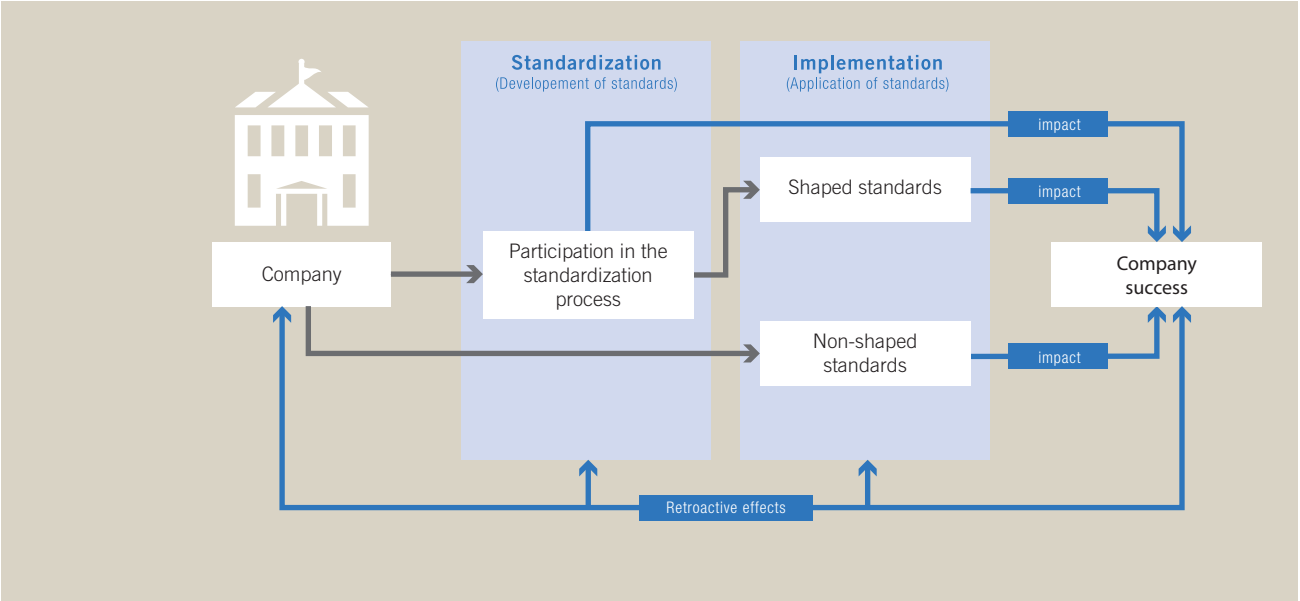
The annual survey is divided into "core questions" and "subject related" additional questions. The core question section is based on the following heuristic model (see figure 1). This model is conceptualized comprehensively, thereby enabling the integration of a broad array of questions, which cannot be anticipated today or else can only be answered through long term observation. Here in particular, the model illustrates the multidimensional links between participation in the standardization process, the implementation of formal standards and corporate success.

Standardization activities are characterized by the type and amount of standardization work they demand, e.g. the required time and personnel expense, the work in standardization committees etc. With regard to the implementation of standards, various dimensions of costs and gains are determined. In 2012, the subject related additional topic "conformity assessment" was examined. Apart from these aspects, which mainly concern the standardization process and the implementation of standards, the German Standardization Panel's long term goal is to determine the effect of standards and their application on corporate success.

In this context, a set of scientific questions can be formulated: Does participation in the standardization process increase the success which can be achieved by the implementation of formal standards? Does standardization have a direct impact on corporate success or rather an indirect one through the networking with other companies and organizations in standardization? Which dimensions of success are affected by standardization? Do the insights gained mainly apply to those standards which one actively helped develop or is it a general learning process? What does this learning process look like? Do company-specific characteristics influence the corporate success of standardization activities? Does the effect of standardization activities vary depending on the industry or the company size?

The first survey offers some evidence for answering the last two questions, in particular. More complex ones, e.g. regarding learning effects, can only be answered through the analysis of the temporal progression of standardization activities, the implementation of formal standards and corporate development.

Figure 1:
Heuristic model of the standardization panel



Realisation

For the first survey, altogether 1,700 companies were invited by email to participate in the poll. The largest part of business representatives was formed by 1,081 members of the DIN e. V. These participants received a short version of the questionnaire without the additional section on the assessment of conformity. Furthermore, 619 contacts from the INS basic study "The Interrelation between Patents and Formal standards" were approached. Using various databases, 534 more businesses were identified and the link for registration was sent to them by post. For this, a link for registration for the survey (without the sections on certification and accreditation) was provided on the websites of the DIN e. V., the FNS e. V., the DNP and the TU Berlin. Moreover, the support of several associations[3] was gained for the survey.

3 The supporting associations were the following: AGKI – Association of Importers for Personal Protection GbR, BvH – German Federal Association for Hand Protection e. V., GKV – General Confederation of the Plastics-Processing Industry e. V., HKI – Industrial Association House, Heating and Kitchen Technology e. V., KVD – Customer Service Association Germany e. V., VDA – German Association of the Automotive Industry e. V., ZVEI – German Electrical and Electronic Manufacturers' Association e. V. and the ANP – German Committee of Standards Users e. V.)

Subsequently, the questionnaire was accessed online 603 times. After eliminating forms which had been filled out twice, incompletely or not at all, 309 data sets remained. For 275 of these businesses, it was possible to compare the provided additional information on the company with data of the Hoppenstedt company database. With the additional information, the main activity was determined and used as a means to attribute the industry in which the respective company is active. This way, 296 companies were identified and it was possible to gain industry specific information on the significance of standardization as well as the application of formal standards, standards and specifications.

In total, 237 of the 309 replies were retracable to the 1,700 contacted companies. This represents a response rate of 14%. However, while the rate of the DIN members was 10% (104 of 1,081 contacted businesses), it was lower than that of former INS basic study participants (21.5%, 133 of 619 contacted businesses). Consequently, 72 companies seized the opportunity of open participation by registering (after taking notice of the survey via the websites mentioned above or after receiving the link for registration in the mail).

The following indicator report summarizes the answers of the 309 questionnaires of the first survey briefly. For this, the industry affiliation and the company size served as criteria of distinction in order to structure the results and to identify conspicuities. As the case number for the construction industry is very small with only six completed forms, the results concerning this industry should be regarded with caution. This should be taken into consideration when comparing the numbers and figures.

Formal standards are the most important type of standard for businesses

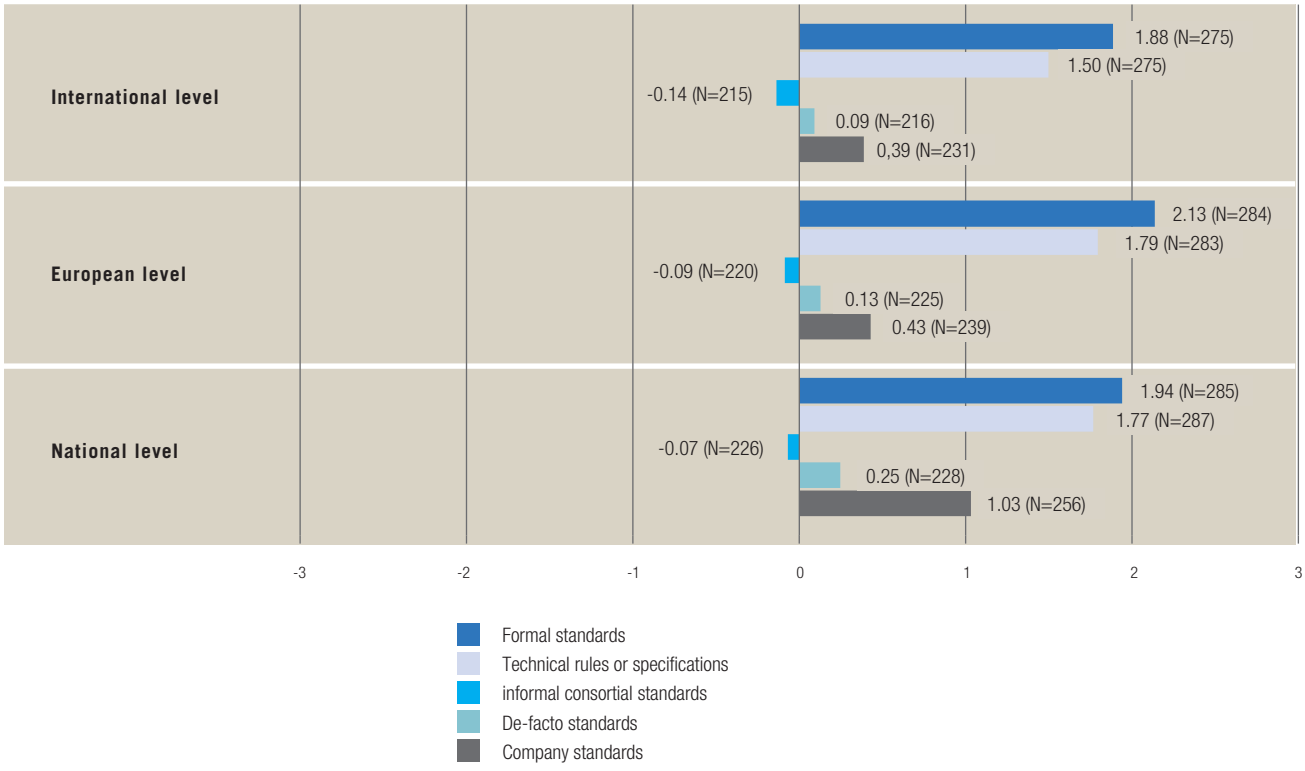
Relevance of formal standards, informal standards and specifications

The results of the first survey indicate that formal standards and technical rules or specifications of official standardization organizations are of great significance for the interviewed businesses. Consortial and de-facto standards, however, are considered less important.

As a previous study on the economic benefit of standardization shows, company standards improve intra-company processes[4]. Furthermore, the results of the standardization panel indicate that company standards are highly relevant. Figure 2a underlines this result.

Figure 2a:
Average assessment of relevance of different standard types of institutions on different regional levels.

On a scale from -3 (highly irrelevant) to +3 (highly relevant)



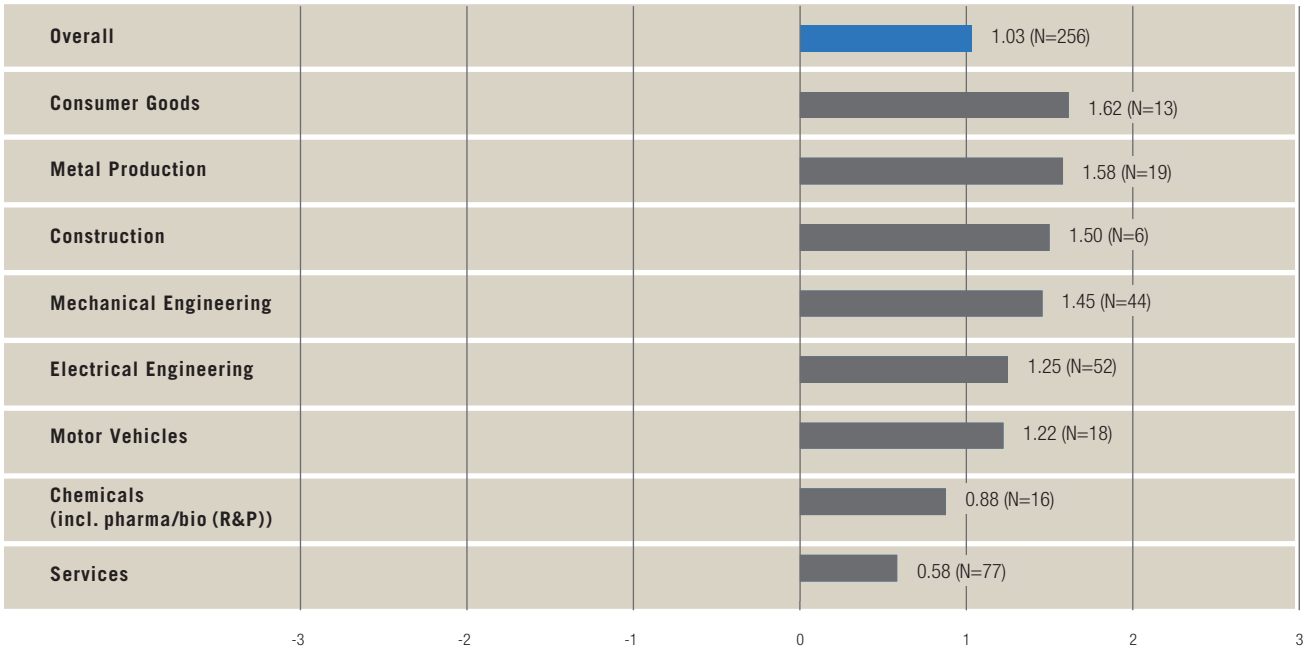
4 Economic benefits of standardization: Summary of results. Final report and practical examples – Part A: Benefits for businesses – Part B: Benefits for the economy as a whole. DIN German Institute for Standardization. Berlin; Vienna; Zürich: Beuth, 2000.

Moreover, the study mentioned above concludes that formal standards are the instrument of choice for cutting transaction costs when businesses correspond with their suppliers and customers in order to strengthen their market power in the face of these partners.

More insights are gained by differentiating between industries. For producers of consumer goods, de-facto and consortial standards at an international level are less important than for businesses in other industries. Technical rules or specifications are also considered less relevant by actors in this industry. However, company standards on the national level are of superior importance (see figure 2b).

Figure 2b:
Average assessment of relevance of company standards at a national level, differentiated by industry.

On a scale from -3 (highly irrelevant) to +3 (highly relevant)

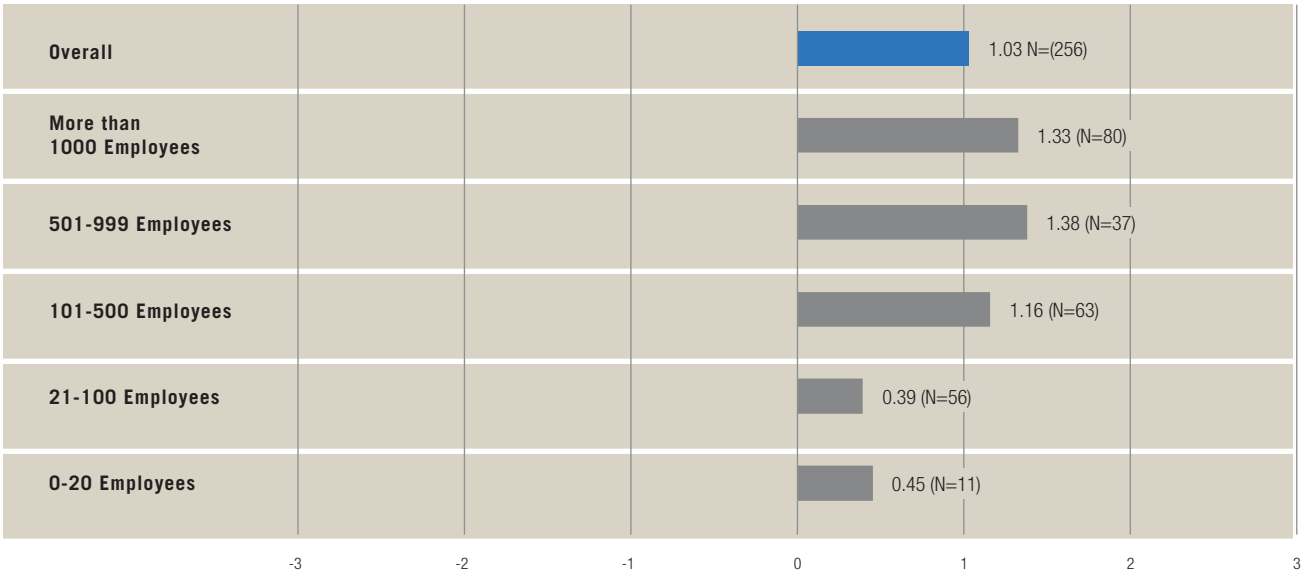


The electronics industry regards the importance of de-facto standards as high in comparison to other industries. Also, for companies in the chemical and pharmaceutical industry, technical rules or specifications play a bigger role than formal standards at all levels.

Formal standards and technical rules or specifications are the most important type of standard for all businesses, while technical rules or specifications are of importance in particular for medium sized companies. Company standards are more important for businesses with more than 100 employees than for smaller ones (see figure 2c).

Figure 2c:
Average assessment of the significance of company standards at a national level, differentiated by company size.

On a scale from -3 (highly irrelevant) to +3 (highly relevant)



Company standards are used by over 80% of interviewed companies

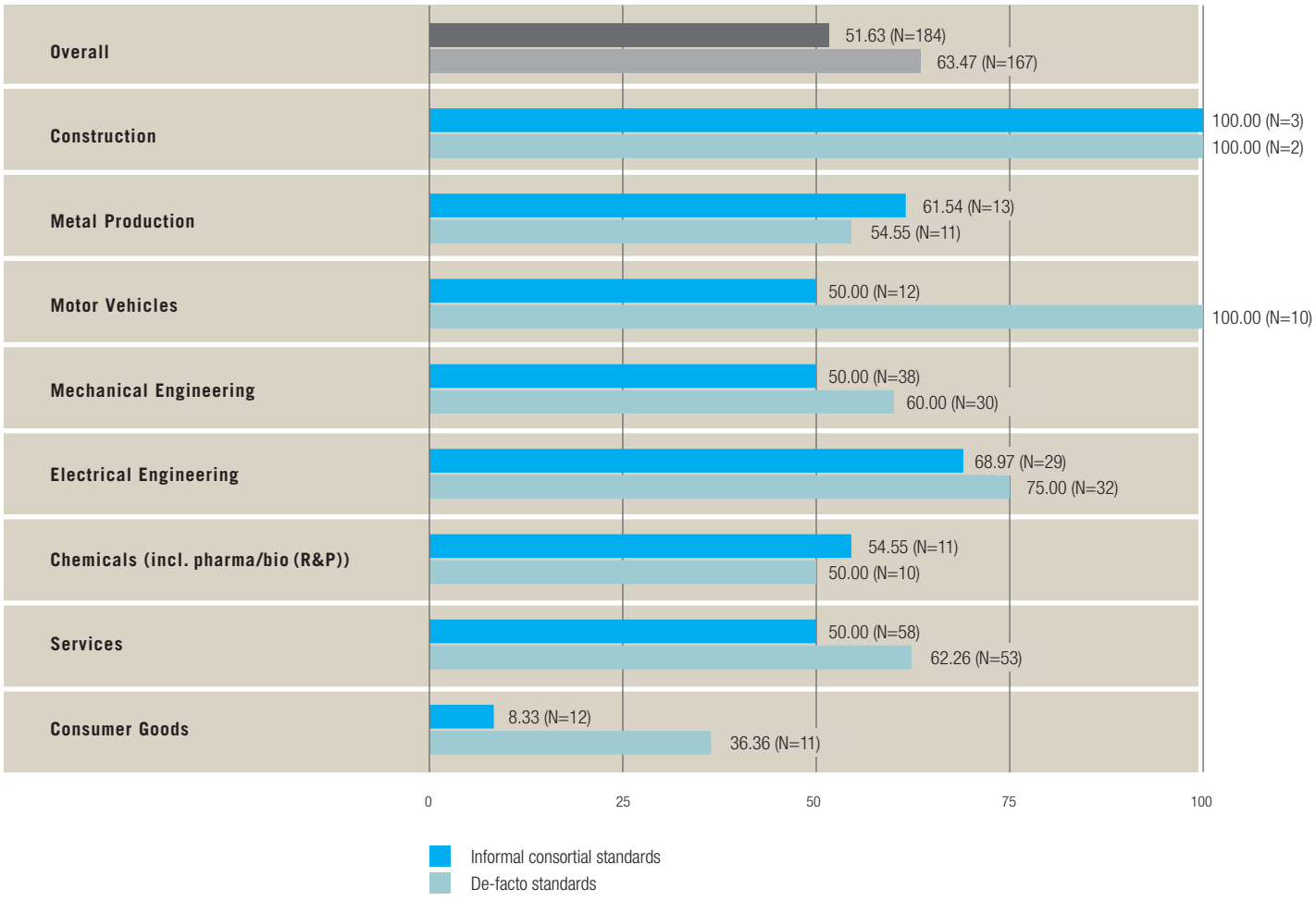
Application of formal standards, standards and specifications

The high significance of formal standards and technical rules or specifications is reflected in the number of standards applied within companies. Around 89%309[5] of the businesses state that they used formal standards in 2011, whereof 38%274 used or implemented more than 100. Also, the majority of businesses (ca. 78%309) applied technical rules and specifications. Regardless of the low significance of consortial standards compared with the formal ones, roughly 31%309 of companies stated that they applied consortial standards in 2011. Moreover, the relatively high importance of company standards is reflected in the frequency of their application: About 59%309 of companies utilized company standards in 2011, a good 16%309 used more than a hundred different ones.

5 89%309 is to read as 89% out of 309 answers.

However, as a detailed analysis of the data shows that there seems to be a pattern in the way that companies from different industries answered the question. While all companies in the mechanical engineering industry state that they used technical rules or specifications in 2011, as much as 19%16 of businesses in the consumer goods industry do not apply such standards. Furthermore, 92%16 of businesses in this sector didn't apply consortial standards and 64%16 didn't apply de-facto standards (see figure 3a).

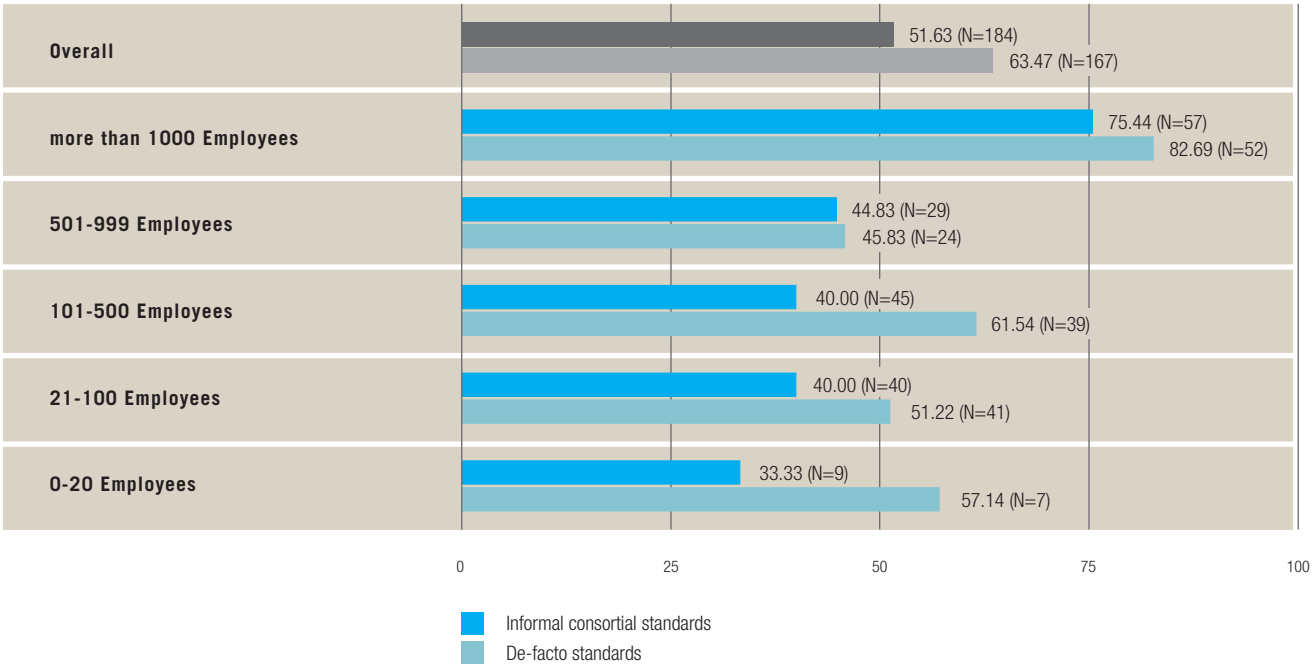
Figure 3a:
Percentage of businesses which applied informal standards in 2011, differentiated by industry.



This assessment reflects the low significance of these types of standards for businesses in the consumer goods industry. Surprisingly, company standards are relatively rarely applied in this sector, considering that they are regarded as quite important at a national level. Apparently the description of products and processes requires relatively few documents. In the automotive industry, 100%10 of companies used de-facto standards in 2011, even if only to a modest extent (see figure 3a). In this sector, formal standards and technical rules or specifications are implemented and used most frequently. Additionally, businesses in the service sector utilize formal standards and technical rules or specifications to a great extent, too.

Moreover, there are differences to be noted between in the way that small sized and large sized businesses apply various types of Standards. Regardless of the business size, there has been a significant increase of applied formal standards. Additionally, nearly all companies (97%69) with more than 1,000 employees apply company standards, and 45%69 even applied more than 100 in 2011. Furthermore, about a quarter (i.e. 26%84) of businesses of that size used over 1,000 formal standards. With de-facto and consortial standards, there is a noticeable scale effect, even though it is more consistent with consortial standards than it is with de-facto standards (see figure 3b).

Figure 3b:
Percentage of businesses which used informal standards in 2011, differentiated by company size



Formal standards highly significant for innovation activities

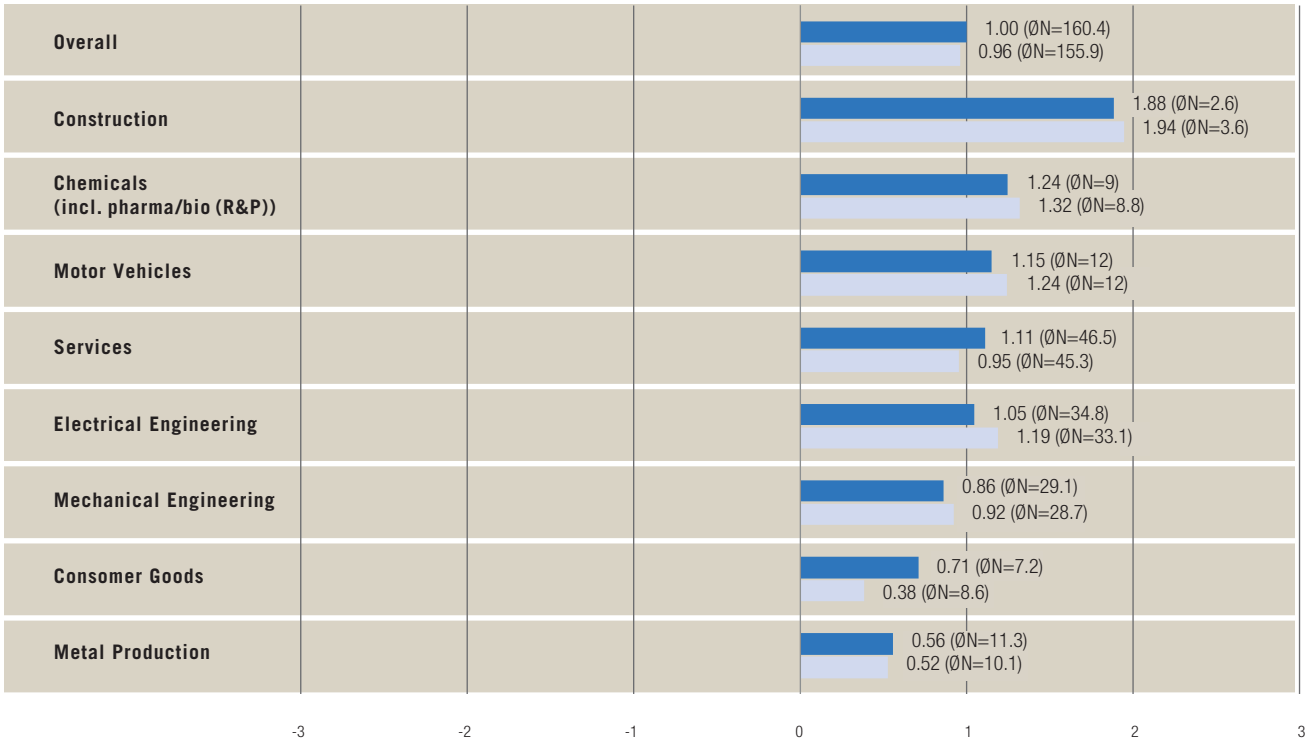
Influence of standards on innovation activities and other dimension

The results of the survey offer important insights into the connections between different standard types and innovation activities of businesses. One of the two most common innovation activities in businesses is the "conception, construction, product design, preparation of production/distribution of innovations (including conceptual activities for the introduction of innovations)", i.e. innovating the production process. The other one is "research and experimental development". The effect of formal standards and technical rules or specifications is considered to be strongest on these two innovation activities (see image 4a). This suggests a close connection between the application of formal standards and technical rules or specifications and the innovation activities of businesses.

Also, standards are an important source of information for a company's own research and development activities. Roughly 82%[246] of interviewed businesses stated that they had used standards as such a source in 2011.

Figure 4a:
Average assessment of the significance of formal standards and technical rules or specifications for the average success of all executed innovation activities, differentiated by industry.

On a scale from -3 (highly irrelevant) to +3 (highly relevant).

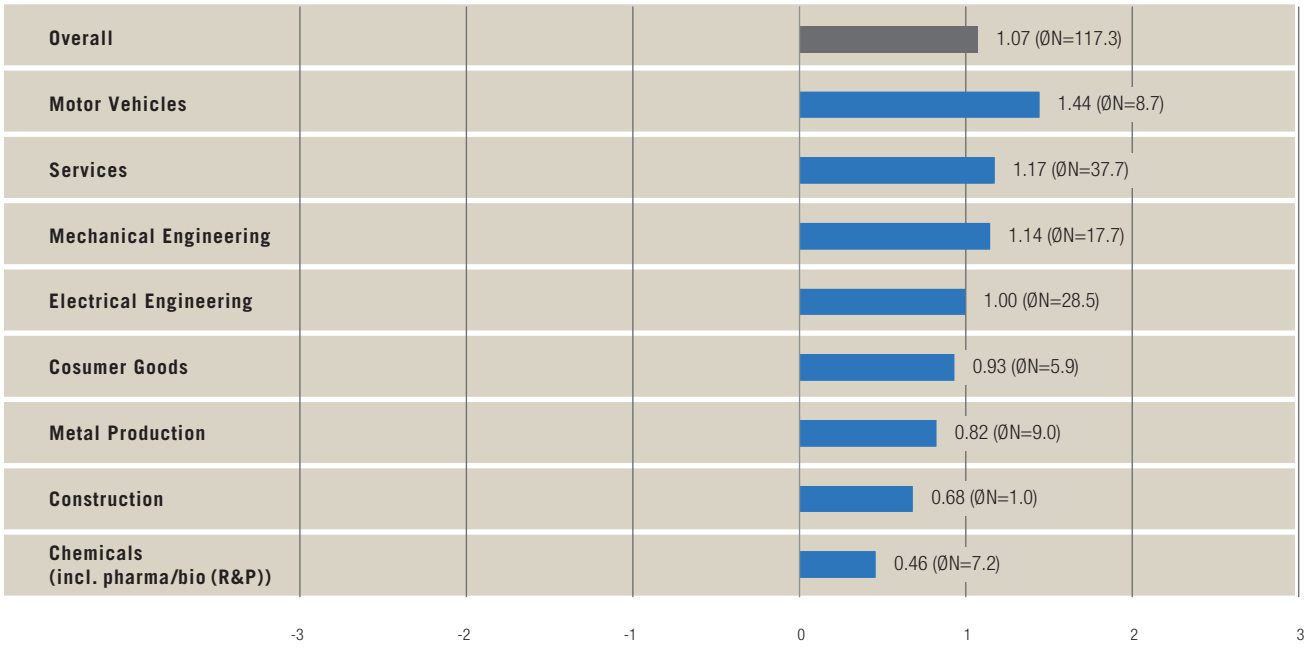


The analysis of the effects which different types of standards have on corporate goals indicates that interviewed companies consider the influence of formal standards and technical rules or specifications stronger than that of consortial and de-facto standards. In particular, topics like unification, conformation to the law and the fostering of legal security, are affected by formal standards and technical rules or specifications. Company standards are mainly relevant for lowering production costs and improving product safety.

A general analysis of the influence of formal standards on corporate goals (i.e. averaged over these) shows that industry specific differences exist (see figure 4b).

Figure 4b:
Average assessment of the influence of formal standards on various corporate goals (depiction averaged over all corporate goals), differentiated by industry

On a scale from -3 (very negative) to +3 (very positive)



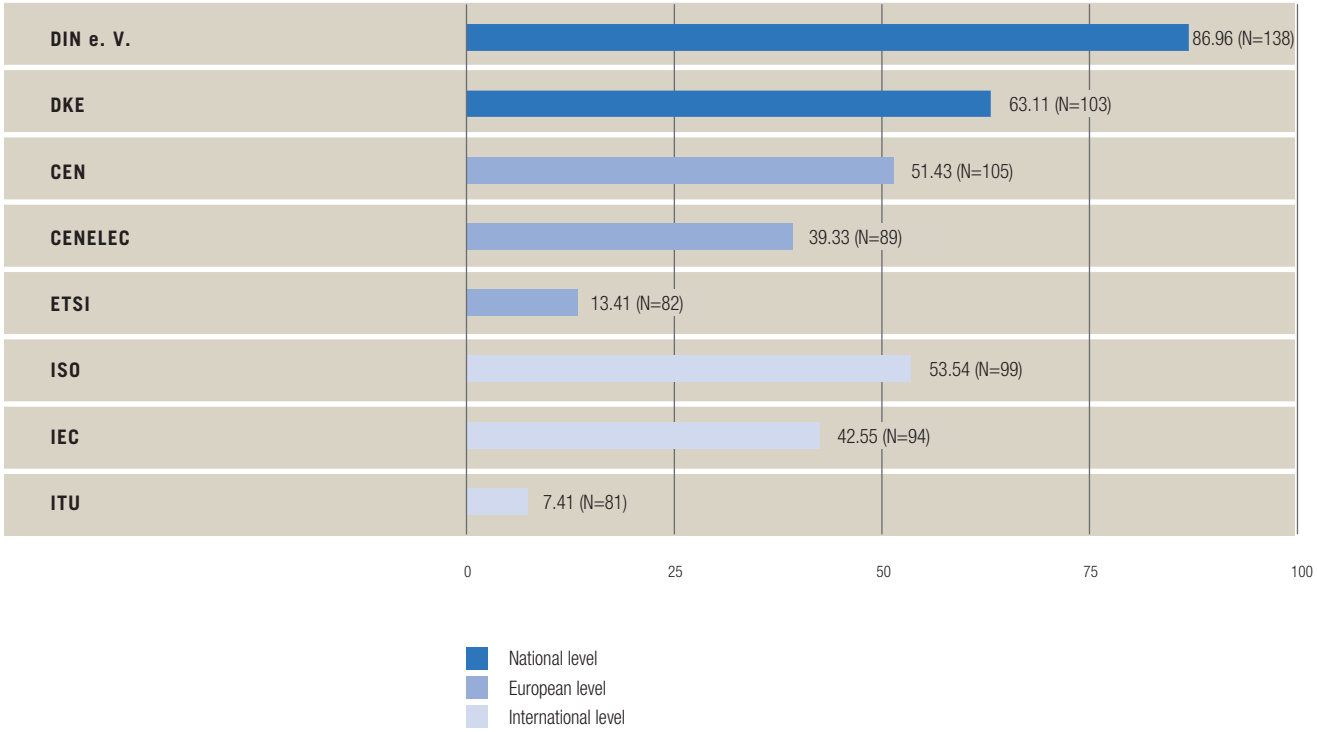
While companies in the automotive industry ascribe a very strong influence to formal standards on the achievement of corporate goals, companies in the chemical and pharmaceutical industry consider the influence of formal standards on various business goals to be quite weak. In the services industry on the other hand, formal standards seem to have a tremendous influence on company goals.

Very high response rate among companies engaged in formal standardization institution committees

Standardization activities

Companies participating in the survey are typically very active in committees of the formal standardization institutions. As visible in figure 5a, in 2011, nearly 87%138 of responding businesses were active in committees of the DIN. In the committees of the DKE, which deals with standardization in the field of electrics and electronics, 63%103 of responding businesses were active. Here, the highest participation rate was among companies of the electrical engineering industry. However, also service providers are strongly represented. At a European and international level, the rate of participation diminishes across the board. This, however, is probably due to the system of representation of national committees in European and international mirror committees by delegates at these levels.

Figure 5a:
Percentage of businesses represented in standardization organizations in 2011.

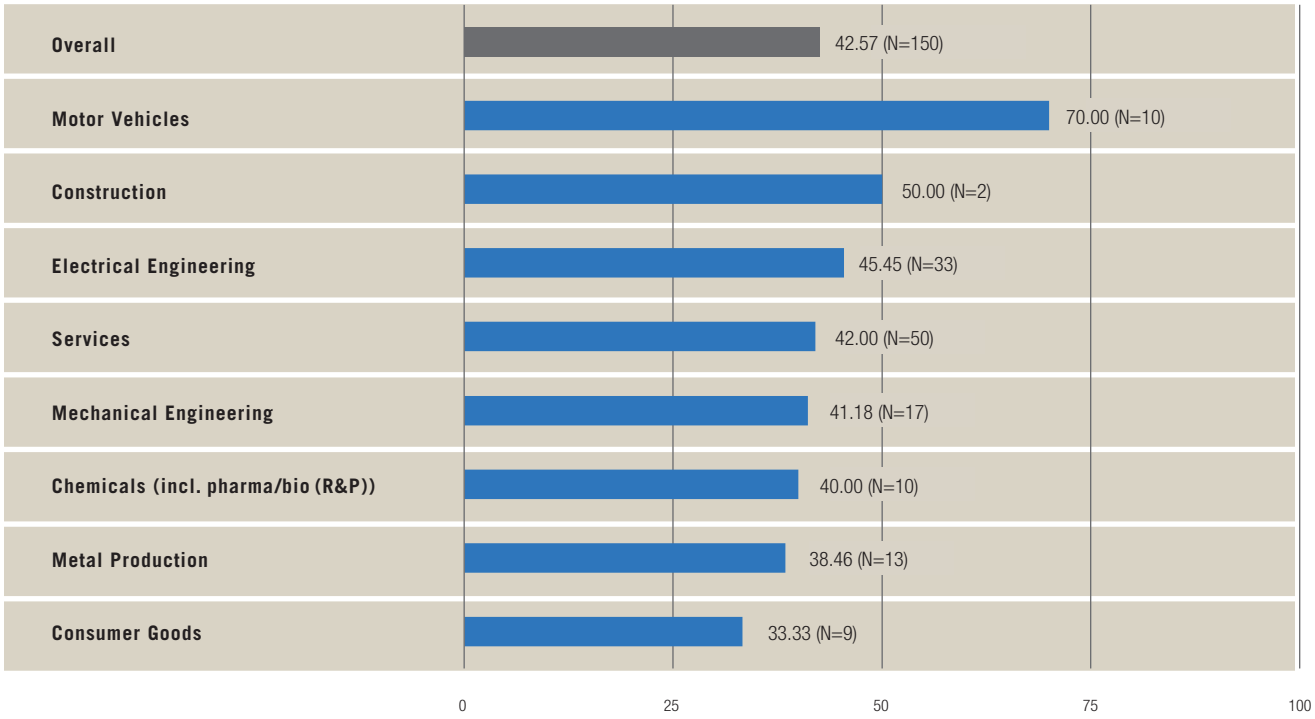


It remains to be said that companies have recognized their possibilities of influencing and steering the standardization process through participation in committees of the official organizations and use them.

Also, the companies active in standardization are constantly active in the standardization process. More than 40%309 of responding companies stated that they had been active in committees of formal standardization institutions between 2000 and 2011. On the other hand, merely 18%309 participated in informal standardization consortia.

The importance of standardization for German companies becomes evident when examining internal corporate structures. 43%150 of businesses active in standardization state that they maintain a separate standardization department in order to meet challenges in standardization adequately. Particularly among companies in the automotive industry, separate standardization departments are common. This is also true for participating businesses from the services industry (see figure 5b).

Figure 5b:
Percentage of businesses with separate standardization department in 2011, differentiated by industry.



If one differs between company sizes, a clear picture emerges: The larger the company, the higher the percentage of ones which have a separate standardization department.

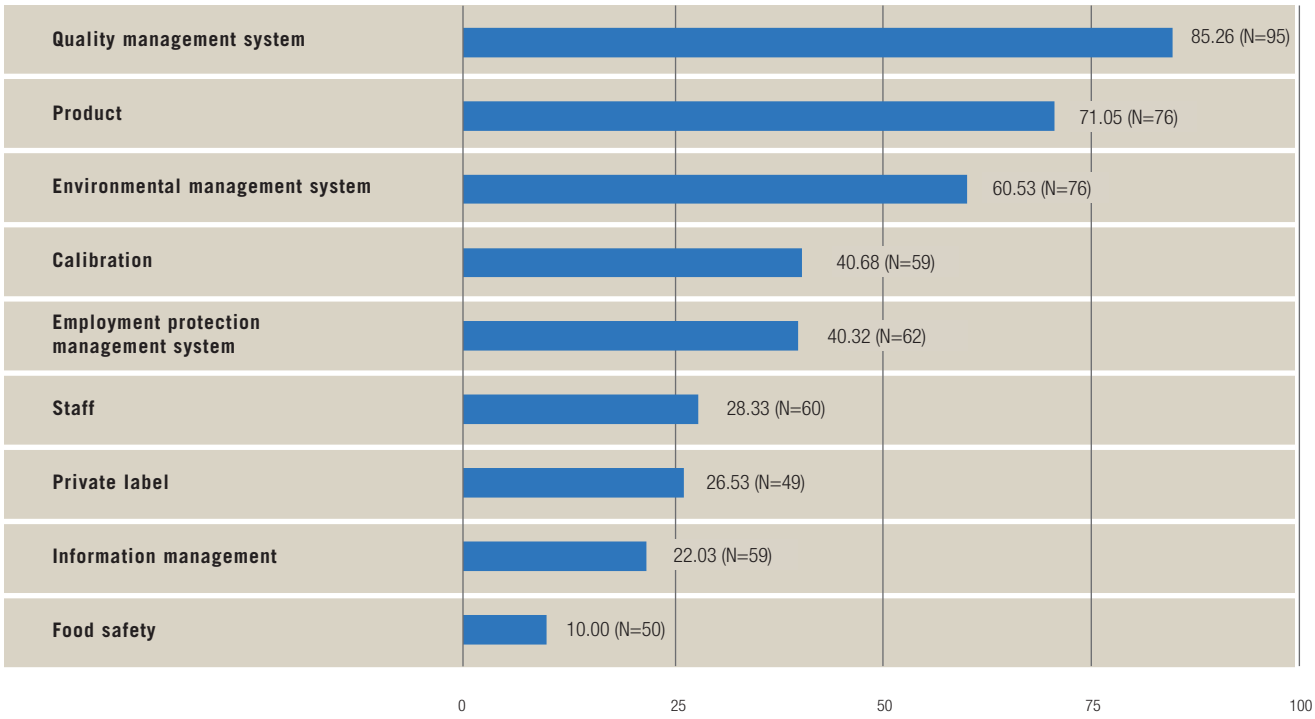
Certifications play an important role for businesses, yet costs enforce application barriers

Importance of conformity assessments

In the section devoted to specific topics, the fields of "certification" and "accreditation" were examined more closely. However, no industry-specific analysis was conducted as only a part of interviewed businesses was asked to complete this part of the questionnaire.

Figure 6a: Percentage of businesses certified in various areas.

As apparent in figure 6a, businesses are certified in the areas of quality management and products in particular.



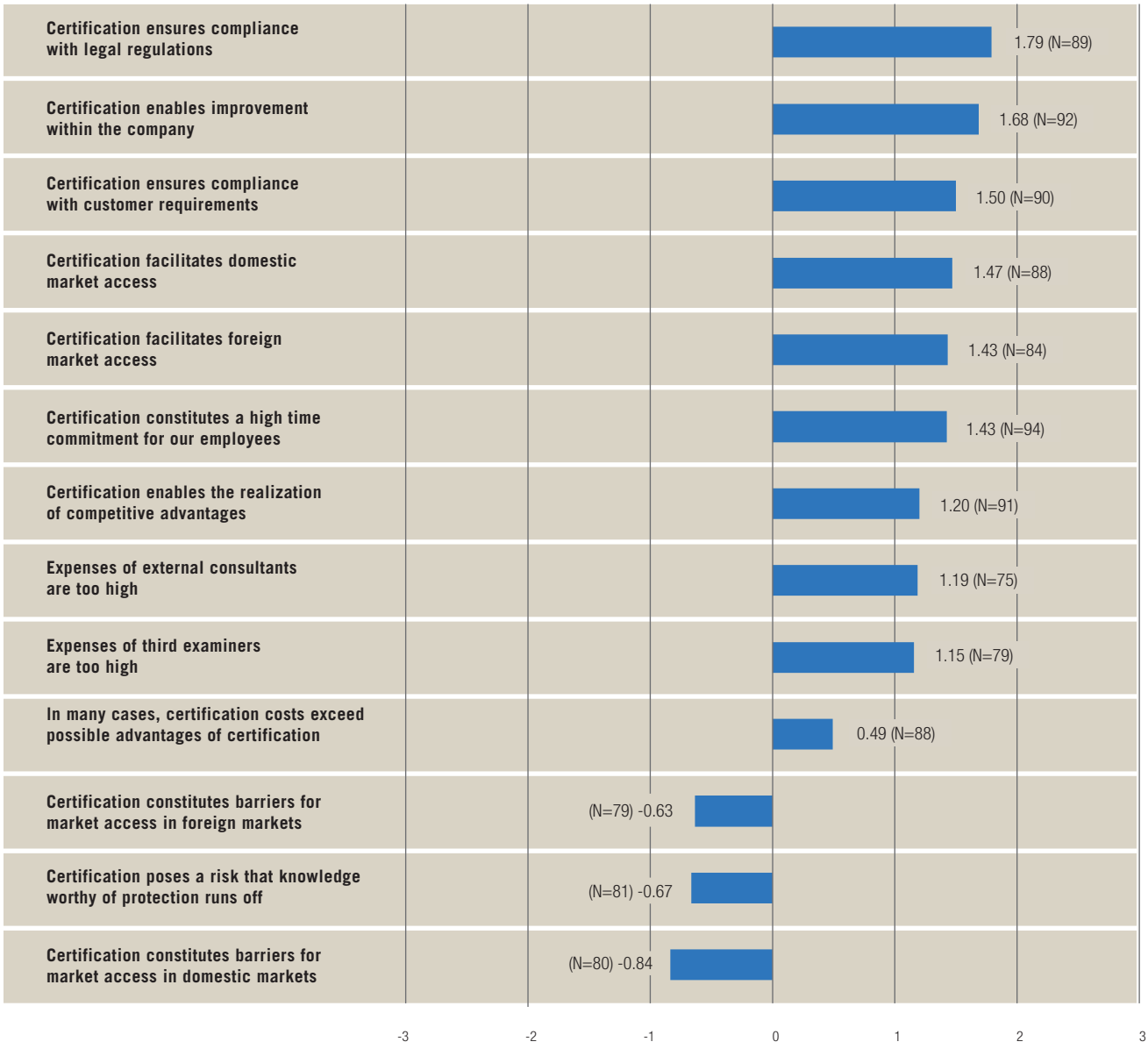
On the other hand, private labels[6] are only the object of certifications for a quarter (26.5%49) of businesses. It should be noted that the certification of quality and environmental management according to formal standards such as ISO 9000 or ISO 14000 as well as product certifications are highly sought after by German companies, while the importance of private standards is marginal.

6 E.g. Fairtrade, FCS, etc.

Additionally, the companies were interviewed on the effects of certification and certificates (see figure 6b).

Figure 6b:
Average assessments of statements concerning certification.

On a scale from -3 (very unimportant) to +3 (very important)



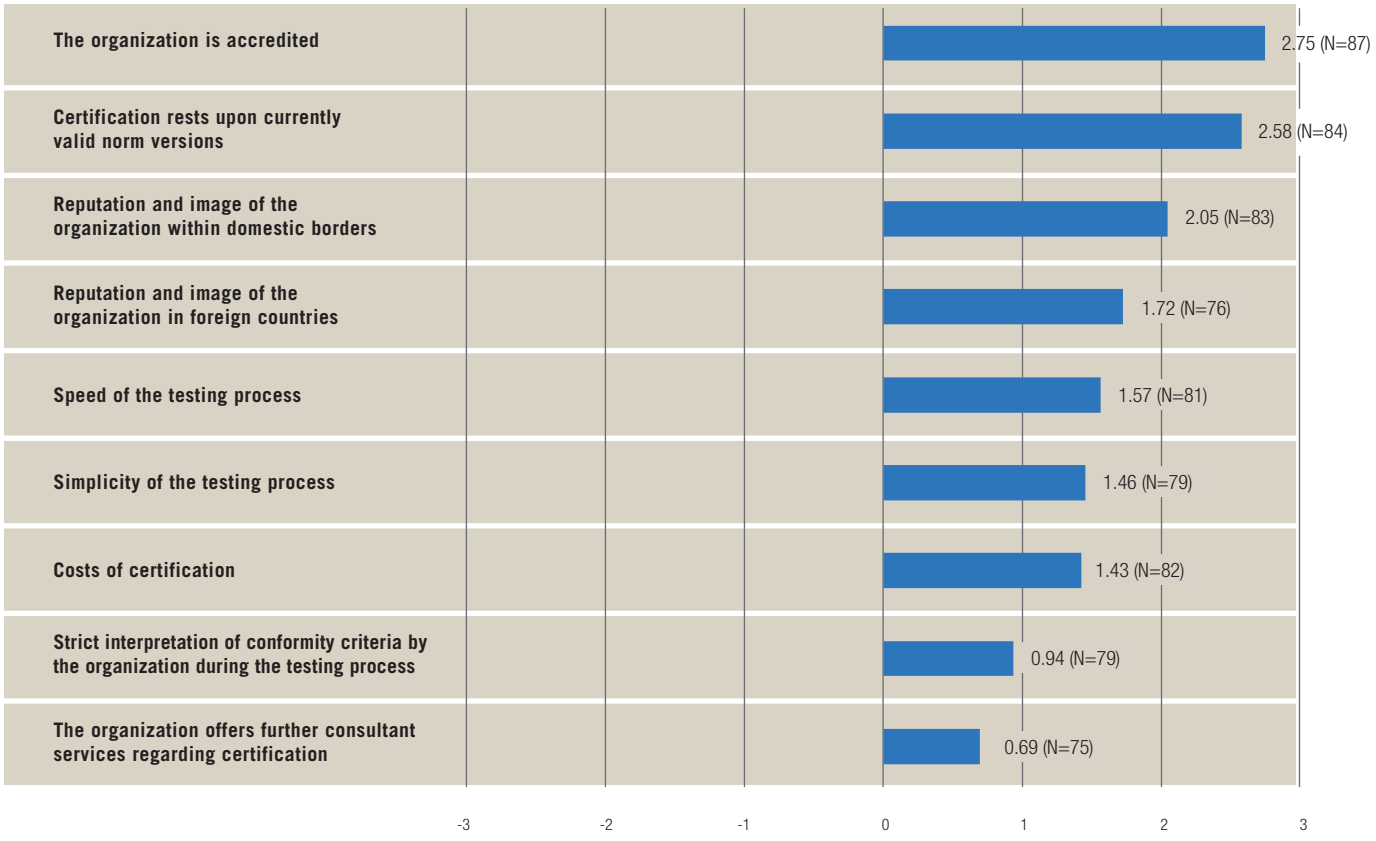
These effects can be divided into internal and external effects. Among the external dimensions of impact, the effects of certification on the compliance with legal regulations, facilitated market access and improved satisfaction of customer expectations are regarded as particularly positive ones. Internal improvements are regarded as additional benefits of certification. The biggest problems, however, are the amount of time necessary for certification as well as high costs for consultants and experts. In fact, companies assess the average costs of certification higher than higher than its utility. However, business-

es neither consider certification a barrier for market access in Germany or abroad, nor do they consider it posing a danger in form of protection-worthy knowledge being drained.

Finally, figure 6c shows the assessment of different criteria for the selection of certification organizations. The most important one seems to be whether or not the certification organization is accredited or not.

Figure 6c:
Average assessment of relevant factors for the selection of certification organizations.

On a scale from -3 (very unimportant) to +3 (very important)



Another criterion is the currentness of the used norm versions for certification. The image and reputation as well as the speed and cost of the certification process are merely of moderate interest. Consulting as an additional service hardly plays a role for companies. This suggests that businesses are well versed in the topic of certification. Finally, the accreditation of certification organizations seems to be the most important criterion for businesses as an indicator of quality. The costs and speed of the certification process, on the other hand, merely play a subordinate role.

Interesting first findings, but the collection of further data is of great importance

Conclusion

The first survey wave of the German Standardization Panel was by all means successful. It became clear that the standards, technical rules and specifications of formal standardization organizations play by far the biggest role for German businesses. This phenomenon is true across the board, regardless of company size or industry. With regard to the importance as well as the application of informal standards, company standards are far more important than de-facto or consortial standards. Formal standards, technical rules or specifications are very important in particular for the product development process and for research and experimental development. The effects of formal standards and technical rules on various business goals are assessed as very important by companies, while the influence of de-facto or consortial standards is seen as weak. Company standards represent the third most important type of standard, not only in terms of significance but also in terms of application.

The high significance of company standards and their development should be the object of further research in order to gain more differentiated insights. A possible shift of the discrepancy which exists between the low significance of consortial standards on the one hand and their frequent application by businesses on the other hand can be examined by the standardization panel in the future.

The high relevance and common application particularly of formal standards and technical rules or specifications is reflected in the study of the participation of German businesses in different formal and informal standardization institutions. Furthermore, the strong importance of the standardization process for medium and large sized companies in particular is underlined by the fact that the majority of them maintain a separate standardization department. The strong participation of businesses in the services industry could suggest a growing demand for service standards.

Although so far mainly DIN members were interviewed and therefore a slight distortion of the answers must be taken into account, the results of coming survey waves of the DNP will indicate whether these answers are sufficiently robust or merely represent snapshots of the situation; which assessments will be valid in the long run and which changes are to be expected in the German landscape of standardization.

It will be important to motivate previous participants to take part in subsequent surveys waves in order to develop a panel structure.

Finally, other businesses have to be convinced to participate in surveys so as to gain a wider, more representative data base.

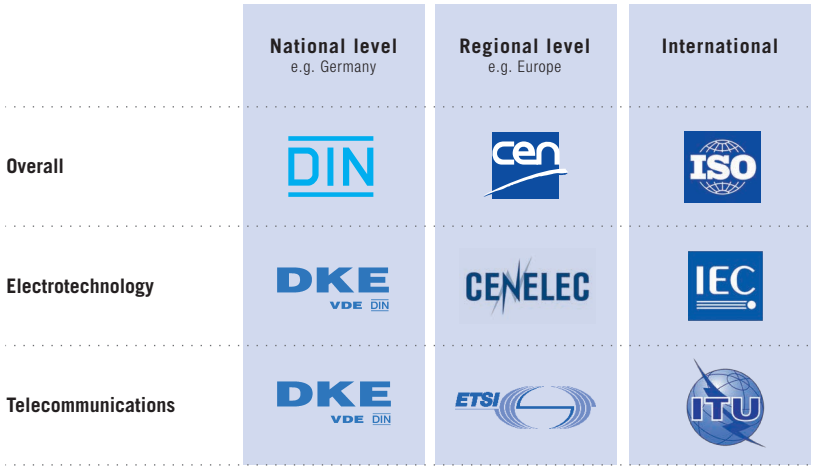
Glossary

Formal standardization

Formal national standardization is the systematic harmonization of material and immaterial items in order to benefit the general public and is corporately conducted by the interested parties (see DIN 820-1: Normungsarbeit, Teil 1: Grundsätze). The determinations are developed in full consensus and get accepted by authorized formal standardization institutions (such as DIN German Institute for Standardization and DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE). Due to its established processes, formal standardization is legitimized very well.

In addition, the international standardization organizations form a network of national standardization institutes. As secretaries of the international standardization activities, DIN employees take care of satisfying existing constitutions and principles. They take care of preparation, implementation and follow-up of conferences held by international standardization councils or German mirror committees (see *www.din.de*)

Figure A.1: Structure of standardization system (Source: www.din.de)



National institutes for standardization

The **DIN German Institute for Standardization** is the commercial organized provider for standardization in Germany. By agreement with the German Federal Government, DIN is acknowledged as national standards body by the European and international standardization organizations. In order to benefit the general public and under reserve of public interest, DIN is responsible for encouraging, organizing, controlling and moderating standardization in well-arranged, transparent procedures. DIN publishes all work results and encourages its implementation. With knowledge and experience, about 33,000 experts contribute to the standardization process, coordinated by the 400 DIN employees (for further information see www.din.de).

The **DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE** serves as non-profit service organization of reliable

Glossary

and efficient generation, distribution and usage of electricity. The DKE is the national organization responsible for the development of standards and safety specifications covering the areas of electrical engineering, electronics and information technology in Germany and is constituted as joint organization of DIN German Institute for Standardization and the VDE Association for Electrical, Electronic & Information Technologies. The VDE is responsible for the daily operations of the DKE. The work results of DKE are integral components of German standards. As VDE specifications, the electrotechnical safety standards form the VDE Specifications Code of safety standards (see *www.dke.de*).

European institutes for standardization

In Europe standards are adopted by the three officially acknowledged European standardization organizations: the **European Committee for Standardization (CEN)**, the **European Committee for Electrotechnical Standardization (CENELEC)** and the **European Telecommunications Standards Institute (ETSI)**. Within the scope of CEN and CENELEC the official standardization institutes of 33 member states work together (see *http://www.cencenelec.eu/aboutus/Pages/default.aspx*).

The European standardization organizations CEN and CENELEC build the frame of all national standardization organizations in Europe. Of each country there is one member included in CEN and CENELEC, who is responsible to represent the interests of his/her country. The German interests are represented by the DIN at the CEN and by the DKE at the CENELEC. A standards committee of DIN decides on active collaboration at European level. The functional support is allocated to a working committee, named mirror committee. This committee identifies the German opinion on a standardization topic and brings delegates into European committees in order to represent the German opinion and to contribute to the process of finding consent on the standardization.[1]

The ETSI produces globally-applicable standards for Information and Communications Technologies (ITC). Among others this includes televisual and radio technologies as well as internet and telecommunication technologies. The European Union officially acknowledged the institute as European standardization organization (see www.etsi.org/about).

International standardization organizations

ISO International Organization for Standardization and **IEC International Electrotechnical Commission** are private organizations and their members are the national standardization organizations. The secretariats of the international committees are conducted decentralized by the member organizations and are distributed all over the world. A standards committee of DIN decides on active collaboration at international level and the adoption of an international standard to the national standards. The organs of ISO and IEC are the General Assembly and as well standardization-political (e.g. Council) and technical

1 DIN: Das kleine 1x1 der Normung – Ein praxisorientierter Leitfaden für KMU (http://www.din.de/cmd?level=tpl-artikel&languageid=de&cmstextid=128876)

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executive committees (e.g. Technical Management Board). The functional work is realized by national delegations and their experts represented in technical committees, sub-committees and working groups.

Another international driver of regulation is the **ITU International Telecommunication Union**. The ITU is a sub-organization of the United Nations, based in Geneva, Switzerland. Recommendations of the ITU are developed by government representatives of the 191 member countries and representatives of enterprises and regional and national organizations. They serve as guideline for legislators and enterprises of the member countries.

Formal standards

In Germany formal standards are developed by committees of DIN and DKE based on full consent decisions by all interested parties and are mostly meant as recommendation. Indeed if they are applied in laws or under private law contracts they can be of indirect legal relevance. They determine general or recurring appliances by rules, guidelines or attributes of operations or their results, whereas an optimal regulation degree in a certain context is strived (see *DIN EN 45020: Normung und damit zusammenhängende Tätigkeiten – Allgemeine Begriffe*). Standards define the state of the art at the time of their publication. For example they contain recommended properties, test procedures, safety requirements or measures (see www.din.de).

The most important standardization notations:

- **DIN** – National standard
- **DIN VDE** – National electrotechnical standards with safety-relevant or EMV-specific determinations
- **DIN ISO, DIN IEC, DIN ISO/IEC** – German edition of an international standard, which has been published by the international standardization organization ISO and/or IEC and is adopted to the German standards as it stands.
- **DIN EN** – German edition of an European standard, which is adopted as it stands by all other members of the European standardization organizations CEN/CENELEC/ETSI
- **DIN EN ISO** – German edition of an European standard, which is identically equal to an international standard and is adopted as it stands by all other members of the European standardization organizations CEN/CENELEC/ETSI.

Informal Standardization

Informal standardization is the development of specifications or standards by a temporarily constituted committee or a standardization consortium. In contrary to standards, a consensus of all participants and the involvement of all interested parties are not stringently required.

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Specification (e.g. DIN SPEC)	A specification is an outcome of the standardization process, which characterizes products, systems or services by defining attributes and determining requirements. Like standards, specifications are developed by experts in formal standardization organizations (e.g. DIN e.V.). Contrary to the development of a formal standard, a consensus of all participants and the involvement of all interested parties are not stringently required.
Consortial standard	An informal consortial standard is as well an outcome of the standardization process. It is developed by a chosen group of enterprises, for example in the context of standardization consortia, and is based on a majority decision.
De-facto standards	De-facto standards are not developed by certain consotria, but are a consequence of market demand. De facto standards are also known as “industry standards” and its development processes as “standardization”. Insofar, the complete standards of industrial lobby groups are de-facto standards.
Technical rules	Professional associations intensely contribute to the work of the DIN standardization committees, in order to represent the interests of their national, European and international members. Additional, some associations develop separate guidelines (see www.din.de). These technical rules are technical suggestions, which recommend a way of how to adhere to a law, a regulation or a technical procedure. They are not like legal formal standards and do not necessarily have the characteristics of legal regulations. But technical rules can obtain force of law, for example by the introduction of general technical approval in the context of Technical Building Regulations. Technical rules of organizations such as VDI, VDMA, VDE, are not adopted under full consensus decisions.
Works standard	Company standards are developed by companies and are established by themselves or by cooperating enterprises (e.g. suppliers). For example, they can be mandatory for suppliers.
Private labels Quality seals	Private labels or quality seals are mostly commercially financed graphical or written product identifications, which give the customer references about the quality or features of a product and thereby should state its quality. This includes adhered safety requirements or environmental characteristics.
Conformity assessment	Conformity assessment includes activities of selecting, identifying, evaluating and confirming. It states the fulfillment of given requirements related to a product, a process, a system, a person or an authority. The conformity assessment includes activities like testing, inspecting as well as certification and accreditation by conformity assessment authorities (see ISO/IEC 17000).
Certification	Certification indicates a procedure, by which a conformity assessment authority confirms in writing, that products, processes or individuals conform to determined requirements (see *DIN EN ISO/IEC 17000: Konformitätsbewertung*). Certification is a sub-process of the conformity assessment. Often certifica-

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tions are limited in time and are assigned by independent certification authorities, for example DQS, TÜV or DEKRA. Regarding standards they are controlled independently or proprietarily.

Accreditation

Accreditation is the confirmation by a national accreditation authority that a conformity assessment authority fulfills the requirements which are determined in harmonized standards and possibly additional requirements. Therefore, an accredited conformity assessment authority may conduct specific conformity assessment activities (see EU-Regulation No 765/2008). Thus many so-called conformity assessment authorities prove the quality of their own work by an accreditation. In this process they prove to an independent accreditation authority, that they work in a functionally competent way with due regard to legal and as well normative requirements on international comparable level. Thereby the accreditation authority examines and monitors the management system and the competence of the appointed personnel of the conformity assessment authority (see *http://www.dakks.de/content/was-ist-akkreditierung* and *www.din.de*).

Panel survey

A panel survey is an iterated survey of an identic circle of surveyed individuals. It prevents falsifications by changing samples.

DEUTSCHER FÖRDERVEREIN ZUR STÄRKUNG DER FORSCHUNG ZUR NORMUNG UND STANDARDISIERUNG E. V.

The German Society for the Promotion of Research on Standardization aims to raise the status of standardization by promoting research focused on its strategic aspects. Once research is established by way of an open German platform, the results obtained can be effectively disseminated at national, European and international levels. In this combination of research, teaching and practical application, standardization will be better able to gain recognition in science, business, politics and society as a strategic tool.

In addition to identifying new trends in science and technology that are relevant for future standardization work, the Society's activities extend to regularly reviewing political measures relating to standardization in order to ensure an early identification of future areas of work and to participate in the ongoing development of the standardization system.

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DEUTSCHER FÖRDERVEREIN
ZUR STÄRKUNG DER **FORSCHUNG**
ZUR **NORMUNG** UND
STANDARDISIERUNG E. V.

978-3-410-94537-6

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