

# International understanding

## The success story of the “Certified Professional for Requirements Engineering”

In most enterprises it has been realized by now that requirements engineering (RE) and business analysis (BA) are decisive for successful software projects. This is backed by numerous relevant studies. However, there are many different ways to apply requirements engineering, depending on organizational structure and project context. It is the goal of the International Requirements Engineering Board (IREB) e.V. [IREB], founded in 2006, to standardize training regarding requirements engineering and thus create an international basis for communication. Leading RE representatives from the fields business, consulting, research and science have joined forces in the IREB in order to standardize training in the field of requirements engineering and thus improve the current practice of RE. To this end, they have created the certification model “Certified Professional for Requirements Engineering” (CPRE).



### Members of the IREB e.V.:

Chris Rupp, SOPHIST GmbH (1. Chairperson)  
Rainer Grau, Zühlke (2. Chairperson)  
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In the four years since its inception, the IREB has developed into the world's leading committee when it comes to certifying specialized professionals in the discipline of requirements engineering. Be it business analyst or software process engineer, all those who must formulate requirements are well served by the CPRE certification model. Though the model originated in Europe, it is now supported by committed members in many countries ranging from North and South America to Europe and Asia. So, what is the point of it all and why is it so important to establish a specialized training for requirements engineering?

## Only if one “requirements language” is used, system development is going to be what it is supposed to be

Errors in analysis are the main cause for costly misdevelopments and failures in system development. More often than not, the reason lies in a defective communication of requirements. Numerous studies show that up to 60% of the errors made in system development originate during requirements engineering. And this is exactly where the IREB wants to change things – attempting to professionalize RE worldwide, as the International Software Testing Qualifications

Board [ISTQB] has done with its “Certified Tester”, in order to help software development projects to be provided with a unified and effective methodology. The focus of these efforts is on requirements engineering for software products, but the – usually inextricably linked – system view is also taken into account. To this end, the IREB develops curricula which form the basis for the certification examinations for the “Certified Professional for Requirements Engineering” (CPRE).

The existing curriculum for the “Certified Professional for Requirements Engineering” Foundation Level (CPRE-FL) addresses the most important basics of requirements engineering, such as:

- ▶ Working with stakeholders during elicitation, negotiation and communication of requirements
- ▶ Different techniques for documenting requirements, be it formulating in natural language or modeling using UML
- ▶ Reviewing and testing requirements and requirements models
- ▶ Managing requirements during the entire lifecycle of a project or product

## Certification – the rules of neutrality and internationality

As experience shows, one of the best approaches to standardizing and professionalizing a discipline is by establishing a certificate approved and acknowledged by all experts of that discipline. Consequently, the IREB has delineated the following requirements for its certificate:

- ▶ Evidence of broad knowledge and known best practices
- ▶ High demands on the curricula and the respective examinations
- ▶ Internationality (available worldwide and in many different languages)
- ▶ Clear integratability with the existing certificates
- ▶ Neutrality by members from very different fields such as universities, business, industry and training organizations and by being legally organized as a registered society without commercial interests

The board behind the certificate is composed of a diversity of people and acts independently of financial

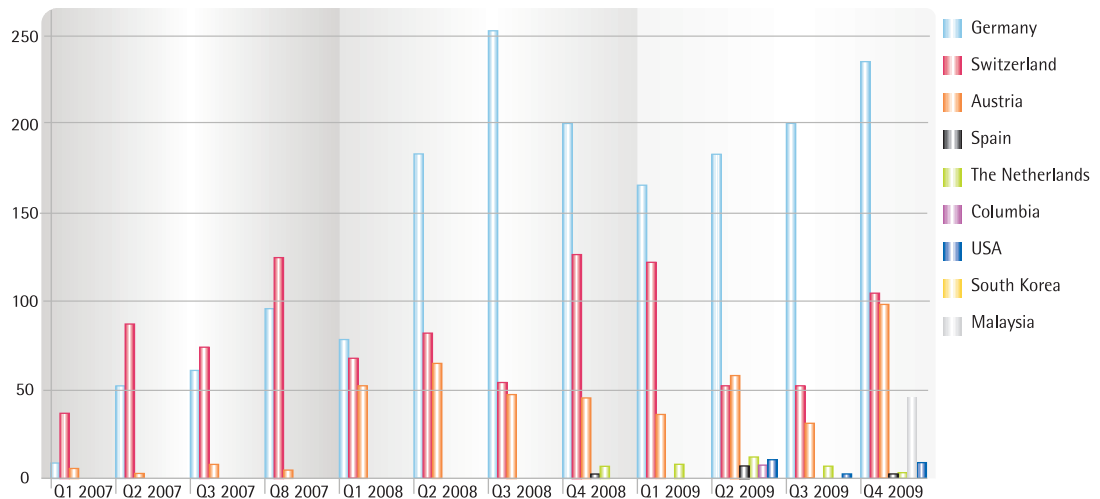


Figure 1: Development of the number of certifications since 1 January 2007

or personal interests. The board is composed by leading respected RE experts. These well-known RE experts who contribute articles, books and lectures to trainings, to the market and to conferences, work together on the IREB and intentionally distance themselves from purely commercially-oriented organizations. Additional international experts who support the IREB help the association to gain international recognition. Therefore, the IREB is now represented in Europe, North and South America and Asia.

usually reveals a number of enterprises which work to purely commercial ends and use such a certificate as a marketing instrument or for financial reasons.

If certificates conform to the rules of the ISO/IEC 17024:2003 on the other hand, there is a clear separation between the following three areas of responsibility into three independent legal organizations:

- ▶ Definition of the curriculum and elaboration of the certification exam
- ▶ Training based on the curriculum
- ▶ Examination and issuing of certificates

Only this separation of definition, training and examination allows for any real neutrality of the certifications in any area of knowledge. The IREB e.V. has committed itself to adhere to the ISO/IEC 17024:2003.

Moreover, the CPRE curriculum has been aligned with other well-known certificates of the IT business (i.e. project management, testing and software architecture), which adhere to this regulation. The most prominent of these certifications are the PMI, the IPMA, the ISTQB and the ISAQB. When compiling the curriculum, the IREB takes

great care to explicitly dissociate the contents taught from those of the aforementioned certificates. Therefore, businesses can define professional profiles using a career model and then link the attainment of the individual steps of a professional profile to a pre-described set of certificates. At the same time, this allows for the standardization of vocational training. The IREB has been attempting to assemble a sustainable certification model, an effort – as the ever-growing number of examinees since the inception of the certificate in 2007 shows – that has been successful. On the whole, 3,253 people have taken the test (as of end of 2009) (565 in 2007, 1,264 in 2008 and 1,424 in 2009; most of these in Germany, Switzerland and Austria). However, certificates have been awarded in other countries as well (Spain, the Netherlands, Bulgaria, Columbia, the US, South Korea, Malaysia). With a passing quota of about 80%, a total of 2,590 certificates have been awarded worldwide. The small number of certificates granted in some countries has to do with the fact that contracts with reputable certifying bodies in those countries were only established recently.

## Integration of the CPRE into other certification models

The list of certificates available on the market is very long, complex and keeps changing constantly. Thus it is important to recognize the value of a specific certificate.

Certificates issued by particular companies have a certain value if the company issuing the certificate has a certain size and is well-known. Since any company can go about issuing certificates, it is the market that decides how much value to attribute to these. Usually, such certifi-

cates are not coordinated with existing certification models, since the enterprise offering them is pursuing a proprietary or financial goal. The knowledge which is thus certified typically refers to a specific product and therefore has a short half-life.

Proprietary certificates issued by conglomerates, where the different members commercially interweave curriculum, training and examinations, cannot be recommended. A closer look at such certifications

## Organizational Structure of the IREB e.V.

The IREB differs between full members and supporting members. Only full members may vote. They decide on the orientation of the IREB. The strategic direction and the topics the workgroups handle are decided on during periodic meetings held by the IREB. The composition and elaboration of the contents are then handled autonomously by the workgroups. All members of the IREB work on a 100% honorary basis. As the regulations of

ISO/IEC 17024:2003 demand, the IREB does not carry out the examinations, but licenses accredited certifying bodies. A certain percentage of the examination fees – which the certifying bodies charge the examinees – go back to the IREB in the form of licensing charges, so that the IREB may continue its work. Thus every examinee indirectly fosters the international recognition of his/her certificate.

The most important workgroups include:

- ▶ Elaboration of the Foundation Level curriculum
- ▶ Exam questions and exam Foundation Level
- ▶ Elaboration of the Advanced Level curriculum
- ▶ Exam questions and exam Advanced Level
- ▶ Internationalization
- ▶ Marketing
- ▶ Financial administration

## Cooperation with certifying bodies and training providers

The IREB cooperates with two kinds of partners, the certifying bodies and the training providers. This is one of the major differences between the CPRE certification model and other certifications in that area.

The division between the IREB which supplies the knowledge and exam questions, the training providers which train the exam candidates and the certifying bodies which carry out the examinations into legally independent organizations ensures the neutrality of the certificate as a whole. Every organization can focus on its responsibilities and thus offer the best possible service to each candidate.

The IREB, as an international board of experts, is solely responsible for the elaboration and maintenance of high quality, proven and scientifically verified curricula and the provision of the respective exam questions. Based on the curricula and literature recommendations by the IREB, interested training providers tailor trainings which help prepare candidates for the CPRE certification exam. The candidate must not have partaken in a training to be admitted to a certification exam, but it is strongly recommended. The exam is administered and evaluated by a certifying body, which has been contractually licensed by the IREB. The certifying body is also responsible for delivering the certificate to the examinees. The IREB only licenses a maximum of two certifying bodies per country. Since recently, the Foundation Level examination may also be taken online. The advantages that arise are e.g. a faster evaluation process – the examinee may retrieve his results right after finishing the exam – and a simplified certification procedure (paperless) for the certifying body. Moreover, online certifications make it possible to carry out certification exams virtually anywhere in the world.

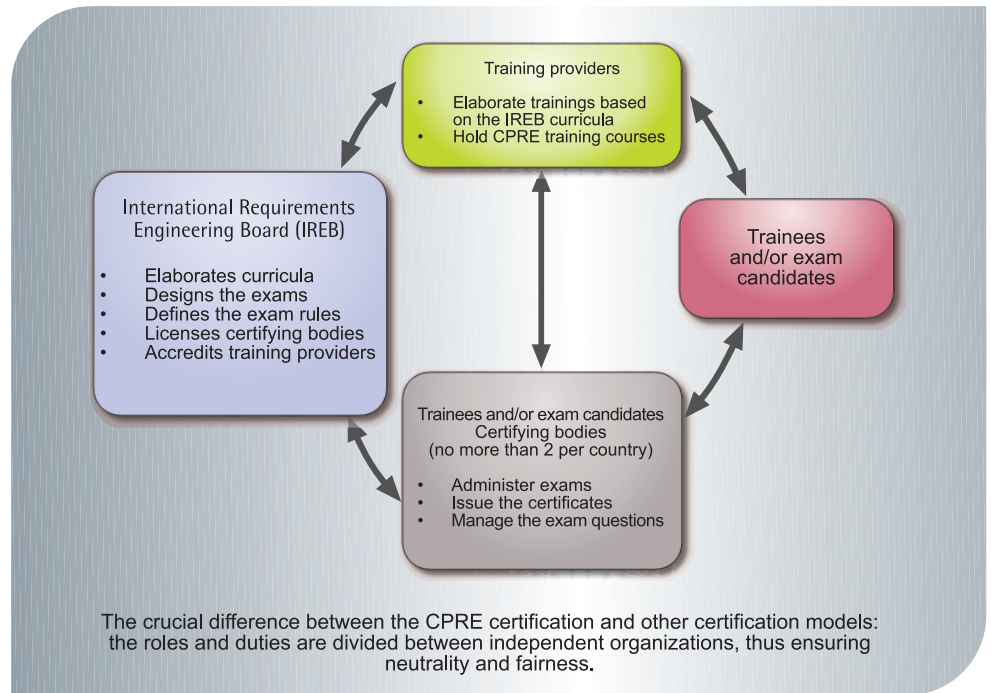


Figure 2: The structure and task assignment of the CPRE certification model

## The "Certified Professional for Requirements Engineering" (CPRE) Certification Model

The CPRE certification model is composed of several levels: The CPRE Foundation Level curriculum defines how the basic setup to establish a systematic and unitary requirements engineering is made, explores the terminology and demarcates the subject from related disciplines. A standardized terminology allows for a better communication between people involved in several projects of any one enterprise, across the borders of that enterprise and – thanks to the international recognition of the IREB certificates – between companies in different countries. This is the IREBs contribution to international understanding.

The CPRE Foundation Level curriculum is available in German and English and may be downloaded from the website of the IREB ([www.certified-re.de](http://www.certified-re.de)). The translation into Spanish is under way and will be published soon. Since March 2009, a complementary textbook to the Foundation Level CPRE certificate has become available [PR09], which helps better prepare for the exam and of which more than 2,000 copies have been sold already.

The modular concept of the Advanced Level addresses the fact that not every sub-domain of requirements engineering is relevant for every specialized profession. Specialization and practicality are the hallmarks of the Advanced Level modules, combined within a sound general



Figure 3: The modular structure of the Advanced Level CPRE (incomplete list)

framework. The figure below explores the structure of the CPRE model for the Advanced Level:

The CPRE vocational training is an advantage for the industry. Well-qualified employees are the most important factor when turning ideas into reality at a high level of quality. Many companies, such as Siemens [SIE], have already realized this simple fact and have sent their requirements engineers to follow these new educational paths. Learn more on the homepage of the IREB e.V.: [www.certified-re.de](http://www.certified-re.de)

#### Sources:

- [ISTQB] International Software Testing Qualifications Board – Official Homepage: <http://www.istqb.org>
- [IREB] International Requirements Engineering Board – Official Homepage: <http://certified-re.de> (english version [www.certified-re.com](http://www.certified-re.com))
- [PR09] Pohl, Klaus/Rupp, Chris: Basiswissen Requirements Engineering. Aus- und Weiterbildung zum Certified Professional for Requirements Engineering Foundation Level nach IREB-Standard. Dpunkt-Verlag. Heidelberg 2009
- [SIE] Siemens AG Österreich – Online report (German): [http://www.pse.siemens.at/apps/sis/ge/pseinternet.nsf/CD\\_Index?OpenFrameset&Bookmark&/0/PK4DB79EAD39B26C92C125746D004A0EE1](http://www.pse.siemens.at/apps/sis/ge/pseinternet.nsf/CD_Index?OpenFrameset&Bookmark&/0/PK4DB79EAD39B26C92C125746D004A0EE1)
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