
Certification in Project Management

1. Certification Systems

Project managers have two means of personal development open to them. They have a corporate career path, and they have individual certification. “Project manager” is not a protected professional title, which is one reason why individual professional certification has become very important. These qualifications are a reflection of the project manager’s knowledge, ability and experience, and they increase the market value of the individual in question. At the same time, some form of common language and common approach is needed, particularly where an organisation is working towards the same certification standard.

There are several certification routes available today. The leading organisations are the IPMA (International Project Management Association), which is recognised internationally and especially throughout Europe and Asia, and PMI (Project Management Institute) which was originally an American organisation and which has international members but a core base in the USA. The IPMA standard is based more on a generic model, with an emphasis on soft skills. The PMI standard features clearly defined terminology, with more emphasis on methods and tools.

The two systems offer the following certification levels (Fig. 1):

PMI		IPMA	
PgMP®	Program Management Professional	IPMA Level A®	Certified Projects Director
PMP®	Project Management Professional	IPMA Level B®	Certified Senior Project Manager
		IPMA Level C®	Certified Project Manager
CAPM®	Certified Associate in Project Management	IPMA Level D®	Certified Project Management Associate
			Basic Certificate in Project Management (GPM – Deutsche Gesellschaft für Projektmanagement)

Fig. 1 Comparison of IPMA and PMI certification levels

As well as these two main systems there are also a wide range of other standards. These tend to expand on the main systems, or to be of a complementary nature. For example, it can be beneficial to add one of the following additional qualifications to a PMI or IPMA certification:

HERMES: This is a procedural model that was developed in Swiss government circles, and is used mainly in ICT projects. There are two different certificates:

- HSPTP HERMES: Swiss Project Team Professional
- HSPM HERMES: Swiss Project Manager

PRINCE 2: A process-oriented approach, developed in Great Britain as a government standard for ICT projects and used mainly in the UK.

SCRUM: Two role-specific certificates for this agile approach in the software development field.

As well as certification schemes for individuals, there are also certification schemes for organisations. These include CMMI, a maturity and improvement process for business project management.

2. IPMA Certification

Title	Capabilities	Certification Process			Validity		
		Stage 1	Stage 2	Stage 3			
Certified Projects Director (IPMA Level A) [®]	Competence: • applied knowledge • relevant experience	A	• Application • Curriculum vitae • Self assessment • References • Project list	Program-/Portfolio-description	Projects Director report	5 years	
Certified Senior Project Manager (IPMA Level B) [®]		B		Project description	Project report		Interview
Certified Project Manager (IPMA Level C) [®]		C		Written exam	Short project report		
Certified Project Management Associate (IPMA Level D) [®]	Knowledge	D	• Application • Curriculum vitae • References	Written exam			

Fig. 2 The IPMA certification process

There are two leading international certification organisations in project management, the IPMA (International Project Management Association) and the PMI (Project Management Institute).

Because the IPMA is more widely used and has greater acceptance in Europe, we decided to produce a reference list of all of the topics that are required and tested for IPMA certification, with links to the relevant pages in this book. IPMA’s four certification levels are described in the image above (Fig. 2).

3. The IPMA Eye of Competence

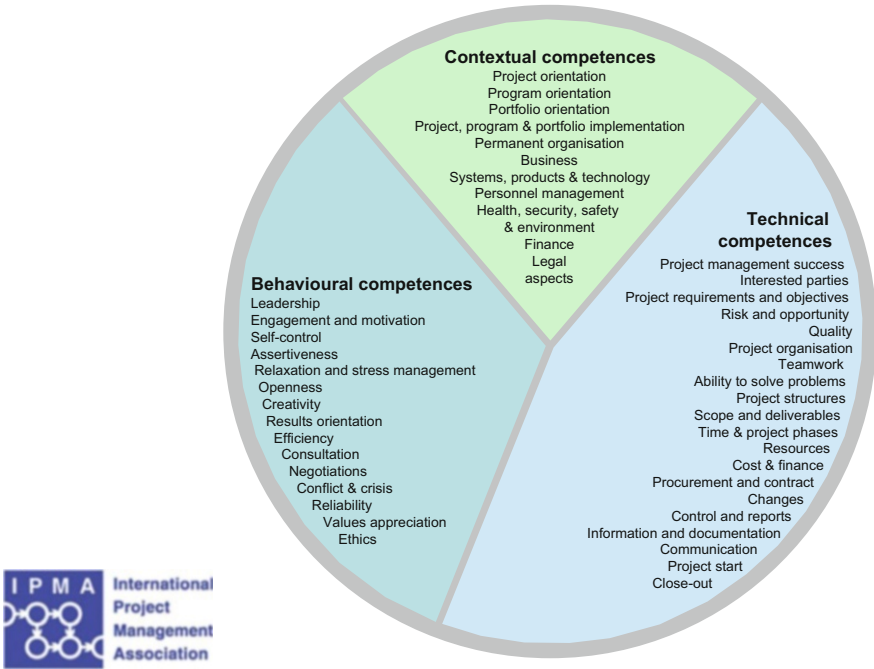


Fig. 3 The IPMA eye of competence (based on the Swiss National Competence Baseline, Version 4)

4. Reference List to IPMA Competence Baseline

The first step towards certification in project management involves a self-evaluation. This helps assess your own knowledge and experience of the topics discussed above in the project management field. The following reference list is based on the IPMA Competence Baseline (ICB Version 4), and provides links between the IPMA competence elements and the relevant pages in the book.

4.1 Technical Competence

No.	Subject	Reference (Chapter)
1.01	Project management success	15, 17
1.02	Interested parties	11, 14, 18
1.03	Project requirements and objectives	9, 13, 26
1.04	Risk and opportunity	17
1.05	Quality	16, 17
1.06	Project organisation	3, 10, 15
1.07	Teamwork	19
1.08	Problem resolution	26
1.09	Project structures	10, 11
1.10	Scope and deliverables	11, 15, 16, 25
1.11	Time and project phases	PM compass, Part II, 16
1.12	Resources	Part I, 16
1.13	Cost and Finance	16, 17
1.14	Procurement and contract	17
1.15	Changes	17, 25
1.16	Control and reports	17, 18
1.17	Information and documentation	18, 26
1.18	Communication	18, 25
1.19	Start-up	19
1.20	Close-out	13, 18

4.2 Behavioural Competence

No.	Subject	Reference (Chapter)
2.01	Leadership	19, 20
2.02	Engagement and motivation	19, 20
2.03	Self-control	20, 25
2.04	Assertiveness	19
2.05	Relaxation	20, 25
2.06	Openness	15, 19, 24
2.07	Creativity	19, 26
2.08	Results orientation	10, 11, 12, 20
2.09	Efficiency	20, 25
2.10	Consultation	15, 19, 21, 24
2.11	Negotiation	14, 20, 25
2.12	Conflict and crisis	17, 22
2.13	Reliability	19
2.14	Values appreciation	19, 20
2.15	Ethics	21

4.3 Contextual Competence

No.	Subject	Reference (Chapter)
3.01	Project orientation	3
3.02	Program orientation	7
3.03	Portfolio orientation	7, 15, 25
3.04	Project, program and portfolio (PPP) implementation	15, 25
3.05	Permanent organisation	15, 18, 19
3.06	Business	21, 25
3.07	Systems, products and technology	14, 15, Part IV
3.08	Personnel management	8, 19
3.09	Health, security, safety and environment	20, 21, 25
3.10	Finance	16, 17
3.11	Legal	14

Bibliography

1. Basics

- Daenzer, W. F. (Hrsg.). (2002). *Systems engineering*. Zürich: Verlag Industrielle Organisation. ISBN 3-85743-998-X.
- Gandolfi, A. (2001). *Von Menschen und Ameisen: Denken in komplexen Zusammenhängen*. Zürich: Orell Füssli. ISBN 3-280-02669-5.
- Ninck, A. (2001). *Systemik, Integrales Denken, Konzipieren und Realisieren*. Zürich: Orell Füssli. ISBN 3-85743-994-7.
- Schein, E. (2010). *Organisationskultur*. Humanistische Psychologie. ISBN 978-3-89797-014-4.
- Staeble, W. H. (1999). *Management, eine verhaltensorientierte Perspektive*. München: Vahlen. ISBN 3-8006-2344-7.
- Steiger, T., & Lippmann, E. (2008). *Handbuch angewandte Psychologie für Führungskräfte*. Berlin: Springer. ISBN 978-3-540-76339-0.
- Thommen, J.-P. (2004). *Managementorientierte Betriebswirtschaftslehre*. Zürich: Versus. ISBN 3-03909-000-3.
- Vester, F. (2002). *Unsere Welt – ein vernetztes System*. München: Deutscher Taschenbuch. ISBN 3-423-33046-5.

2. Project Management in General

- Becker, M. (2004). *EDV-Wissen für Anwender*. Zürich: Verlag Industrielle Organisation. ISBN 3-857-43700-6.
- Burghardt, M. (2002a). *Projektmanagement*. Erlangen: Publicis MCD. ISBN 3-89578-199-1.
- Burghardt, M. (2002b). *Einführung in Projektmanagement*. Erlangen: Publicis MCD. ISBN 3-89578-198-3.
- Buttrick, R. (1997). *The project workout*. London: Pitman Publishing. ISBN 0-273-62680-9.
- DeMarco, T. (2005). *Der Termin, Ein Roman über Projektmanagement*. Wien: Hanser. ISBN 3-446-40165-2.
- Dobiey, D. (2004). *Programm-Management: Projekte übergreifend koordinieren und in die Unternehmensstrategie einbinden*. Weinheim: Wiley. ISBN 978-3-527-50121-2.
- Doppler, K., & Lauterburg, C. (2002). *Change management*. Frankfurt: Campus. ISBN 3-593-36819-6.
- Gareis, R. (2006). *Happy projects*. Wien: Manz'sche Verlags-Universitätsbuchhandlung. ISBN 978-3-214-08438-7.

- Gessler, M. (2010). *Kompetenzbasiertes Projektmanagement (PM3): Handbuch für die Projektarbeit, Qualifizierung und Zertifizierung*. GPM Deutsche Gesellschaft für Projektmanagement, Okt 2010. ISBN 978-3-924-84140-9.
- Häfele, W. (2007). *OE-Prozesse initiieren und gestalten, ein Handbuch für Führungskräfte, Berater/innen und Projektleiter/innen*. Bern: Haupt. ISBN 3-258-07552-2.
- Heintel, P., & Krainz, E. (2000). *Projektmanagement: eine Antwort auf die Hierarchiekrise?* Wiesbaden: Gabler. ISBN 3-409-43201-9.
- Hobbs, P. (2001). *Professionelles Projektmanagement*. Frankfurt: mvg. ISBN 3-478-86002-4.
- Holland, D. (2002). *Projektmanagement für die Chefetage*. Weinheim: VCH Verlagsgesellschaft. ISBN 3-527-50041-3.
- Jenny, B. (2006). *Projektmanagement*. Zürich: vdf Hochschulverlag. ISBN 3-7281-3043-5.
- Jenny, B. (2009). *Projektmanagement – das Wissen für den Profi (2. Auflage)*. Zürich: vdf Hochschulverlag. ISBN 978-3-7281-3290-1.
- Kerzner, H. (2003). *Projekt Management*. Bonn: mitp-Verlag. ISBN 3-8266-0983-2.
- Lombriser, R., & Abplanalp, P. (2005). *Strategisches Management*. Zürich: Versus. ISBN 978-3-03909-049-5.
- Oestereich, B., & Weiss, C. (2007). *APM – Agiles Projektmanagement*. Heidelberg: dpunkt.verlag. ISBN 978-3-898-64386-3.
- Patzak, G. (2004). *Projekt Management*. Wien: Linde. ISBN 3-7143-0003-1.
- Petersen, D., Witschi, U., et al. (2011). *Den Wandel verändern: Change-Management anders gesehen*. Wiesbaden: Gabler. ISBN 978-3-834-92672-2.
- Pfetzling, K. (2004). *Ganzheitliches Projektmanagement*. Giessen: Verlag Dr. Götz Schmidt. ISBN 3-921-313-678.
- Rattay, G. (2003). *Führung von Projektorganisationen*. Wien: Linde. ISBN 3-7073-0433-7.
- Rietiker, S. (2006). *Der neunte Schlüssel – vom Projektmanagement zum projektbewussten Management*. Bern: Haupt. ISBN 978-3-258-07044-5.
- Scheuring, H. (2007). *Der www-Schlüssel zum Projektmanagement*. Zürich: Orell Füssli. ISBN 3-85743-727-8.
- Zink, K. J., Kötter, W., Longmuss, J., & Thul, M. J. (Hrsg.). (2009). *Veränderungsprozesse erfolgreich gestalten*. Heidelberg: Springer.

3. Methodology

- Ahlemann, F. (2008). *Project management software systems*. Würzburg: BARC.
- Berkel, K. (2002). *Konflikttraining, Konflikte verstehen und bewältigen*. Heidelberg: Sauer. ISBN 3-79387-280-7.
- Böhm, R. (2005). *Methoden und Techniken der System-Entwicklung*. Zürich: vdf Hochschulverlag. ISBN 3-7281-2956-9.
- DeMarco, T. (2003). *Bärentango, Mit Risikomanagement Projekte zum Erfolg führen*. Wien: Hanser. ISBN 3-446-22333-9.
- Gomez, P. (1999). *Die Praxis des ganzheitlichen Problemlösens*. Bern: Haupt. ISBN 3-258-05575-0.
- Heitger, B. (2002). *Harte Schnitte, neues Wachstum: Die Logik der Gefühle und die Macht der Zahlen im Changemanagement*. Wien: Redline, Wirtschaft bei Überreuter. ISBN 3-8323-0913-6.
- Kerzner, H. (2001). *Project management maturity model*. New York, NY: Wiley. ISBN 0-471-40039-4.
- Königswieser, R., & Keil, M. (2000). *Das Feuer grosser Gruppen: Konzepte, Designs, Praxisbeispiele für Grossveranstaltungen*. Stuttgart: Klett-Cotta. ISBN 3-608-91026-3.
- Königswieser, R., Sonu, E., & Gebhard, J. (2006). *Komplementärberatung, das Zusammenspiel von Fach- und Prozess-Know-how*. Stuttgart: Klett-Cotta. ISBN 978-3-608-94142-5.
- Königswieser, R., & Exner, A. (2002). *Systemische Intervention, Architektur und Designs für Berater und Veränderungsmanager*. Stuttgart: Klett-Cotta. ISBN 3-608-91938-4.

- Lippmann, E. (2009). *Intervision, Kollegiales Coaching professionell gestalten*. Heidelberg: Springer. ISBN 978-3-540-78852-2.
- Osterloh, M. (2006). *Frost Jens, Prozessmanagement als Kernkompetenz*. Wiesbaden: Gabler. ISBN 3-409-33788-1.
- Schwarze, J. (2001). *Netzplantechnik*. Herne: Neue Wirtschafts-Briefe. ISBN 3-482-56068-4.
- Seifert, J. W. (2003). *Moderation & Kommunikation*. Offenbach: Gabal. ISBN 3-89749-003-X.
- Seiwert, L. J. (2001). *Das 1 x 1 des Zeitmanagement*. Frankfurt: mvg Taschenbuch Business Training. ISBN 3-478-81125-2.
- Sell, R. (2002). *Probleme lösen, In komplexen Zusammenhängen denken*. Berlin: Springer. ISBN 3-540-43687-1.
- Stroebe, R. W. (2004). *Motivation, Arbeitshefte Führungspsychologie*. Heidelberg: Recht und Wirtschaft. ISBN 3-80057-316-4.
- Varga von Kibéd, M., & Sparrer, I. (2004). *Ganz im Gegenteil: für Querdenker und solche, die es werden wollen*. Heidelberg: Carl-Auer-Systeme. ISBN 3-89670-235-1.

4. Teams, Team Management, Conflicts

- Antons, K. (2000). *Practising group dynamics*. Göttingen: Hofgreffe. ISBN 978-3801713706.
- Backhausen, W., & Thommen, J.-P. (2003). *Coaching: Durch systemisches Denken zu innovativer Personalentwicklung*. Wiesbaden: Gabler. ISBN 3-409-12005-X.
- Bohm, D. (2005). *Der Dialog – das offene Gespräch am Ende der Diskussion*. Stuttgart: Klett-Cotta. ISBN 3-608-91857-4.
- Cohn, R. (2011). *Introduction to TZI*. Basel: Beltz. ISBN 978-3407229212.
- Cronenbroeck, W. *Handbuch internationales Projektmanagement*. ISBN 3-589-23600-0.
- Fisher, R., et al. (2009). *Das Harvard-Konzept: Der Klassiker der Verhandlungstechnik*. Frankfurt: Campus. ISBN 978-3-593-38982-0.
- Frank, G. (2004). *Work Life Balance – Leistung und liebe Leben, Work Life Balance Expert Group*. Frankfurt: Redline Wirtschaft. ISBN 3-636-01122-7.
- Fuchs, H. (2002). *Die Kunst (k)eine perfekte Führungskraft zu sein; 60 Denkanstöße für zukunftstaugliche Manager*. Wiesbaden: Falken & Gabler. ISBN 3-8068-2583-1.
- Gellert, M., & Nowak, C. (2002). *Teamarbeit – Teamentwicklung – Teamberatung, ein Praxisbuch für die Arbeit in und um Teams*. Meezen: Limmer. ISBN 3-928922-13-0.
- Glasl, F. (2004). *Konfliktmanagement: Ein Handbuch für Führungskräfte, Beraterinnen + Berater*. Stuttgart: Freies Geistesleben. ISBN 3-77250-954-1.
- Greif, S., & Kurtz, H.-J. (1998). *Handbuch selbstorganisiertes Lernen*. Göttingen: für angewandte Psychologie. ISBN 3-8017-0837-3.
- Gruhl, M. (2008). *die Strategie der Stehauf-Menschen, Resilienz – so nutzen Sie Ihre inneren Kräfte*. Freiburg im Breisgau: Herder. ISBN 3-7831-3444-7.
- Hofstede, G. *Cultural dimensions*. ISBN 978-3-42350-807-0.
- Janssen, C. (1996). *The four rooms of change (Förändringens fyra rum)*. Stockholm: Wahlström & Widstrand.
- Kälin, K. (1999). *Sich selbst managen: die eigene Entwicklung im beruflichen und privaten Umfeld gestalten* (Ausgabe mit CD-ROM). Thun: Ott. ISBN 3-7225-6680-0.
- Kreyenberg, J. (2008). *Handbuch Konfliktmanagement*. Berlin: Cornelsen. ISBN 3-589-23604-3.
- Lay, R. (1999). *Dialektik für Manager; Methoden des erfolgreichen Angriffs und der Abwehr*. Berlin: Econ & List. ISBN 3-612-26659-4.
- Marti, S. *Toolbox Führung, nützliche Werkzeuge und Modelle für Führungskräfte und Projektleiter* (8. Auflage). Winterthur: Eigenauflage.
- Mole, J. (2003). *Managing business culture*. London: Nicholas Brealey Publishing. ISBN 1-85788-314-4.
- Pietschmann, H. (2002). *Eris & Eirene, eine Anleitung zum Umgang mit Widersprüchen und Konflikten*. Wien: Ibero. ISBN 3-85052-131-1.

- Pöhm, M. (2001). *Vergessen Sie alles über Rhetorik; mitreissend reden – ein sprachliches Feuerwerk in Bildern*. Frankfurt: mvg. ISBN 3-478-73231-X.
- Ponschab, R., & Schweizer, A. *Kooperation statt Konfrontation*. Köln: Dr. Otto Schmidt. ISBN 3-504-18964-9.
- Roth, G. (2001). *Fühlen, denken, handeln, wie das Gehirn unser Verhalten steuert*. Frankfurt: Suhrkamp. ISBN 3-518-58313-1.
- Satir, V., et al. (1995). *Das Satir-Modell, Familientherapie und ihre Erweiterung*. Paderborn: Junfermann. ISBN 3-87387-167-X.
- Schulz von Thun, F. (2000). *Miteinander reden – Störungen und Klärungen*. Hamburg: Rowohlt. ISBN 3-499-17489-8.
- Schwarz, G. (2005). *Konfliktmanagement: Konflikte erkennen, analysieren, lösen*. Wiesbaden: Gabler. ISBN 3-40979-605-3.
- Simon, F. B. (2004). *Gemeinsam sind wir blöd!?* Heidelberg: Karl Auer System. ISBN 3-89670-436-2.
- Sprenger, R. (2010). *Mythos Motivation, Wege aus einer Sackgasse*. Frankfurt: Campus. ISBN 978-3-593-39200-4.
- Stock, R. (2002). *Coaching von Teams, ein systematischer Ansatz zur Messung und Steigerung der Einflussgrößen des Teamerfolgs*. zfo, Zeitschrift Führung + Organisation, 71. Jg., Heft 2.
- Tuckman, B. (1977). Stages of small group development. *Group and Organizational Studies*, 2, pp. 419–427.

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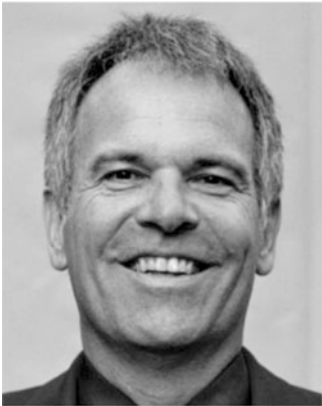
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Appraisals

This book is a follow-up to the proven BWI guidelines, and it offers full updated information on project management. The structure of this book makes a refreshing change from many previous publications on this topic. The project management compass helps you navigate your way through a realistic project flow. At the same time, this book offers in-depth information on models, methods and checklists. I am particularly impressed by the underlying reference to the current IPMA Competence Baseline.

This is an excellent manual for practical project management in today's world.

Prof. Dr. Heinz Schelle

Honorary Chairman of the GPM (German Project Management Association)

The authors' many years of practical experience in setting up, implementing and managing projects shines through in this book. Project management is being used ever more frequently as a management approach in a wide range of companies and organisations. The book also reflects the current trend towards increased social competence.

I am therefore pleased to recommend this book as a basis for certification in project management.

Dr. Hans Knöpfel

Honorary President of the SPM (Swiss Project Management Association)

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Note: Entries with page numbers shown in **bold** text are **main entries**, and indicate that the keyword is discussed in depth. Where page numbers are printed in a regular font, the entries are minor entries and refer to additional information or comments about the keyword.

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