CERTIFIED MASTER BLACK BELT (MBB)
BODY OF KNOWLEDGE MAP 2018

The Certified Master Black Belt (MBB) Body of Knowledge (BOK) has been updated to ensure that the most current state of practice is being tested in the examination. If you would like more information on how a BOK is updated, see a description of the process on http://asq.org/cert/faq/create-body-of-knowledge.

Part of the updating process is to conduct a content analysis to determine whether the topics in the 2010 BOK are still relevant to the job role of Master Black Belt and to identify any new topics that have emerged since that BOK was developed. The results of the MBB content analysis showed that nearly all of the topics that were in the 2010 BOK are still relevant to the job roles of MBB in 2018.

The 2018 Certified Master Black Belt Body of Knowledge (MBB BOK) will be introduced at the July 6, 2018, administration. Both BOKs will be available online until August 1, 2018, at which time the 2010 BOK will be removed.

General comments about ASQ Body of Knowledge updates

When the Body of Knowledge (BOK) is updated for an ASQ exam, the majority of the material covered in the BOK remains the same. There are very few programs that change significantly over a 5-7 year period. One of the points that we make to all of the exam development committees is that ASQ Certification Exams need to reflect "the state of practice" not "the state of the art" – this helps to keep the programs grounded in what people currently do, rather than being driven by the latest hot-topic improvement idea or trend. Typically, the biggest change in any updated BOK is in how the content is organized. When a new BOK is announced and posted on the ASQ website, we also include a "BOK Map" that highlights the changes between the two bodies of knowledge: old and new. The BOK map also clearly identifies any new content that has been added to the exam, as well as any content that has been removed from the exam.

With regard to exam preparation materials, you should be able to use any of the reference books that are currently listed on the bibliography for the exam program. These are the source materials that the exam development committees use to write questions and verify answers.

Specific comments about the 2018 MBB Body of Knowledge updates

There were minimal changes made to the content when updating the MBB BOK. One noted change that is present throughout the 2018 BOK is the replacement of the wording 'Six Sigma' with 'Improvement', additionally sections on DFSS, Destructive measurement systems, and Data management and analytics were added.

Table 1 starting on Page 2 presents the 2018 MBB BOK, maps the topics to the 2010 BOK, and details the modifications that have been made.

Table 1. 2018 MBB BOK mapped to the 2010 MBB BOK

2010 BOK	2018 BOK Details	New Elements in 2018 BOK
	I. Enterprise-wide Planning (20 questions)	Renamed section and decrease in questions by 5
1.A	**A. Strategic plan development** Describe and use strategic planning tools and methods such as Hoshin Kanri, X Matrix, SWOT, PEST, PESTLE, Ansoff Matrix, Porter's Five Forces, TQM, Business Process Reengineering, Balanced Scorecard, and business excellence models (Baldridge, EFQM, ISO, Shingo) and their utilization in developing enterprise planning. (Apply)	Expanded list of tools in subtext.
1.B	**B. Strategic plan alignment** **1. Strategic deployment goals** Describe how to develop strategic deployment goals. (Apply) **2. Project alignment with strategic plan** Describe how to align projects to the organizational strategic plan. (Analyze) **3. Project alignment with business objectives** Describe how to align projects with business objectives. (Analyze)	Increased cognitive levels of B2 and B3 from Apply to Analyze.
1.C	**C. Infrastructure elements of improvement systems** Describe how to apply the following key infrastructure elements. (Apply) **1.** Governance (quality councils or process leadership teams) **2.** Assessment (organizational readiness and maturity models) **3.** Resource planning (identify candidates and costs/benefits) **4.** Resource development (train and coach) **5.** Execution (deliver on project results) **6.** Measure and improve the system (drive improvement into the systems, multiphase planning)	Renamed section
1.D	**D. Improvement methodologies** Demonstrate an advanced understanding of the following methodologies, including their associated tools and techniques. (Apply) **1.** Six Sigma (DMAIC) **2.** Design for Six Sigma (DMADV) **3.** Lean (PDCA, Kaizen) **4.** Theory of Constraints **5.** Business systems and process management **6.** Other problem solving methods (8 disciplines, root cause analysis)	Renamed section, revised and expanded list of methodologies.

1.E	**E. Opportunities for improvement** **1. Project identification** Facilitate working sessions to identify new project opportunities that can be prioritized. (Apply) **2. Project qualification** Determine the elements of a well-defined project (e.g., business case, charter), the process for approving these projects, and tools used in project definition (process maps, value stream maps, QFD, FMEA, Critical-To-x (CTx where x can be customer, design, cost, and quality). (Apply) **3. Stakeholder management** Describe how to identify, engage and strategically align stakeholders. (Analyze) **4. Intervention techniques** Describe techniques for intervening across levels to prevent potential project failures. (Apply) **5. Creativity and innovation tools** Use creativity and innovation tools to develop concept alternatives (divergent thinking). (Apply)	Renamed section and cognitive level of 1.E.3 changed from Apply to Analyze.
1.F	**F. Pipeline management** **1. Pipeline creation** Create, manage, and prioritize a pipeline of potential projects for consideration. (Create) **2. Pipeline lifecycle management** Create a selection process that provides a portfolio of active improvement opportunities that are clearly aligned and prioritized to meet/exceed strategic goals. Monitor, re-evaluate, consolidate, and retire pipelines as needed. (Create) **3. Regulatory impact on pipeline** Assess the impact of regulatory statutes on prioritization/management of pipeline of potential projects. (Understand) **4. Pipeline risk management** Use risk management and analysis tools to analyze organizational elements, to appraise portfolios and critical projects, and to identify potential problem areas. (Evaluate)	Renamed section heading, re-ordered and renamed sub-topics and added F3.

2010 BOK	2018 BOK Details	
	II. Organizational Competencies for Deployment (20 questions)	Increase in questions by 5
1.G.1 **1.G.2**	**A. Organizational design** **1. Systems thinking** Apply systems thinking to anticipate the effect that components of a system can have on other subsystems and adjacent systems including emergent properties. Analyze the impact of actions taken in one area of the organization and how those actions can affect other areas or the customer, and use appropriate tools to prevent unintended consequences. (Analyze) **2. Organizational culture and maturity** Describe the implications organizational culture and maturity levels can have on improvement program implementation, including potential barriers. (Analyze)	Increased cognitive level of 1.G.2 from Understand to Analyze.
2.C	**B. Executive and team leadership roles** **1. Executive leadership roles** Describe the roles and responsibilities of executive leaders in the deployment of improvement programs in terms of providing resources, managing change, and communicating ideas. (Analyze) **2. Leadership for deployment** Create action plans to support optimal functioning of master black belts, black belts, green belts, champions, and other participants in the deployment effort. Design, coordinate, and participate in deployment activities, and ensure that project leaders and teams have the required knowledge, skills, abilities, and attitudes to support the organization's improvement program. (Create)	Moved from 2.C
2.B	**C. Organizational challenges** **1. Organizational dynamics** Use knowledge of human and organizational dynamics to enhance project success and align cultural objectives with organizational objectives. (Apply) **2. Intervention styles** Use appropriate intervention, communications, and influence styles, and adapt those styles to specific situations (i.e., situational leadership). (Apply) **3. Interdepartmental conflicts** Address and resolve potential situations that could cause the program or a project to under-perform. (Apply)	Renamed section

1.H. **1.G.3**	**D. Organizational change management** **1. Change management models** Describe different change management models (Kotter's 8-Step, ADKAR, Competing Values Framework). (Apply) **2. Techniques to gain commitment** Describe how to gain commitment from the organization's leadership for the improvement effort. (Understand) **3. Techniques to overcome organizational barriers** Describe various techniques to overcome barriers to successful organizational deployment. (Apply) **4. Necessary organizational structure for deployment** Develop the inherent organizational structure needed for successful deployment. (Apply) **5. Communications with management** Describe elements of effective communications with management regarding organizational benefits, failures, and lessons learned. (Apply) **6. Organizational culture change techniques** Assess culture of the organization and its ability to problem-solve and improve. Describe techniques for changing an organizational culture, such as rewards and recognition, team competitiveness, communications of program successes, and appropriate cascading of goals throughout the organization. (Apply)	Renamed section, renamed sub-topic D.1., combined 1.H and 1.G.3
2.A	**E. Organizational feedback** **1. Voice of the customer and voice of the process** Assess the appropriate collection of Voice of the Customer and Voice of the Process data, both internal and external. (Evaluate) **2. Capturing and assessing feedback** Develop a customer-focused strategy for capturing and assessing customer feedback on a regular basis. (Evaluate)	Renamed section and broke subtext into two sub-topics.
1.I	**F. Organizational performance metrics** **1. Financial measures** Define and use financial measures, including revenue growth, market share, margin, cost of quality (COQ), net present value (NPV), return on investment (ROI), cost-benefit analysis, activity-based cost analysis, direct costs, indirect costs and opportunity cost, project cash flow, and breakeven time performance. (Analyze) **2. Business performance measures**	Renamed section and consolidated subtext from 4 sub-topics into 2, removed Sarbanes-Oxley Act.

	Describe various business performance measures, including Balanced Scorecard, key performance indicators (KPIs), and the financial impact of customer loyalty, and describe how they are used for project selection, deployment, and management. (Analyze)	
2010 BOK	**2018 BOK Details**	
	III. Project Portfolio Management (15 questions)	Renamed section
3.B	**A. Project management principles and lifecycle** **1. Project management principles** Oversee critical projects and evaluate them in terms of their scope, goals, time, cost, quality, human resources requirements, communications needs, and risks. (Evaluate) **2. Project management lifecycle elements** Apply phases of project management lifecycle (Initiation, Planning, Execution, Control and Closure). (Analyze)	3.B.2 new content
3.A **3.B** **3.C**	**B. Project portfolio infrastructure and management** **1. Governance methods and tools** Develop governance documents, tracking tools, and other methodologies that will support project success. (Create) **2. Cross-functional project assessment** Appraise interrelated projects for scope overlap and refinement, and identify opportunities for leveraging concomitant projects. Identify and participate in the implementation of multi-disciplinary redesign and improvement projects. (Evaluate) **3. Executive and mid-level management engagement** Formulate the positioning of multiple projects in terms of providing strategic advice to top management and affected mid-level managers. (Create) **4. Prioritization** Prioritize projects in terms of their criticality to the organization. (Evaluate) **5. Performance measurement** Design, support, and review the development of an overall measurement methodology to record the progress and ongoing status of projects and their overall impact on the organization. (Evaluate) **6. Monitoring** Apply appropriate monitoring and control methodologies to ensure that consistent methods are used in tracking tasks and milestones. (Analyze)	Renamed section and combined 3.A, B and C, revised subtext, sub-topic names, and cognitive levels. 3.B.2 Analyze to Evaluate, 3.B.4 Apply to Evaluate, 3.B.6 Apply to Analyze, 3.B.9 Apply to Analyze.

	7. Status communication Develop and maintain communication techniques that will keep critical stakeholders and communities apprised of project status, results, and accountability. (Create) **8. Supply/Demand management** Generate accurate project supply/demand projections, associated resource requirements analysis, and mitigate any issues. (Create) **9. Corrective action** Facilitate corrective actions and responses to customers about the corrective action and its impact. (Analyze)	
3.D	**C. Project portfolio financial tools** **1. Budgets and forecasts** Assess and explain budget implications, forecasting, measurement, monitoring, risk analysis, and prioritization for portfolio level projects. (Evaluate) **2. Costing concepts** Define the concepts of hard and soft dollars and use cost of poor quality, activity-based costing, and other methods to assess and prioritize portfolios. (Apply)	Renamed section
2010 BOK	**2018 BOK Details**	
	IV. Training Design and Delivery (10 questions)	
4.A	**A. Training needs analysis** Assess the current level of knowledge and skills in each target group in relation to the skills and abilities that are needed. Conduct a gap analysis to determine the training needs for each target group. (Evaluate)	
4.B	**B. Training plan elements** Design training plans to close the knowledge and skills gaps. Refine the plans based on the number of people needing to be trained in a particular technique or skill, and whether multi-disciplinary or multi-level competency training is appropriate. (Create)	Renamed section
4.C	**C. Training materials and curriculum development** **1. Training material sources** Determine whether to outsource the training or develop in house, including considerations such as cost, availability of internal subject matter experts, and timing. (Analyze) **2. Adult learning theory** Develop or select training methods and resources that adhere to adult learning theories. (Analyze) **3. Integration**	Added 4.C.1

	Ensure that the training harmonizes and leverages other tools and approaches being used and that it is aligned with the organization's strategic objectives and culture. (Evaluate) **4. Training delivery** Monitor and measure training to ensure that it is delivered effectively and efficiently by qualified individuals. (Apply)	
4.D	**D. Training program effectiveness** Develop an evaluation plan to assess, verify, and improve the acquisition of required knowledge and skills within schedule, budget, and other constraints. (Create)	Renamed and expanded subtext.
2010 BOK	**2018 BOK Details**	
	V. Coaching and Mentoring Responsibilities (10 questions)	Revised section name
5.A	**A. Executives and champions** **1. Scoping and resourcing** Collaborate with executives and champions on scoping projects and selecting individuals and assignments for various projects. (Evaluate) **2. Executive reviews** Collaborate with executives and champions on reviewing projects, including timing, questions to ask, and setting expectations for project timing and completion. (Create) **3. Leadership and communication** Coach executives and champions on the need for constancy of purpose and message, and the importance of using clear communication techniques and consistent messages. (Evaluate) **4. Feedback** Use constructive techniques to provide feedback to champions and executives. (Evaluate)	Renamed sub-section 5.A as well as 5.A.1, 2 and 3. Re-ordered 5.A.1 and 5.A.2. Revised cognitive level of 5.A.1from Create to Evaluate, and 5.A.2 from Evaluate to Create.
5.B **5.C**	**B. Teams and individuals** **1. Belt coaching and mentoring** Develop a career progression ladder for belts. Assess their progress and provide constructive feedback to enable them to work effectively on team projects. Use coaching, mentoring, and intervention skills as needed, including canceling or reassigning projects if necessary. (Create) **2. Project reviews** Create guidelines and expectations for project reviews, and perform them in a timely manner. Assist project leaders in selecting appropriate content for presentation to management. (Create) **3. Team facilitation and meeting management**	Renamed sub-topic 5.B as well as 5.B.1 and 2. Added section 5.C. Revised cognitive level of 5.B.1 and 5.B.4 from Evaluate to Create.

	Practice and teach meeting control, analyze team performance at various stages of team development, and support appropriate interventions for overcoming team challenges, including floundering, reviewing and diagnosing failing projects. (Create) **4. Non-belt coaching and mentoring** Develop information that will help non-belt project participants to advance their understanding of improvement initiatives and develop the necessary skills and knowledge to become effective belts. (Evaluate)	
2010 BOK	**2018 BOK Details**	
	VI. Advanced Data Management and Analytic Methods (25 questions)	Revised section name
6.A **6.D**	**A. Measurement systems analysis (MSA), process capability and control** **1. Propagation of errors** Use propagation of errors to evaluate measurement systems based on calculated values from multiple inputs. (Evaluate) **2. Attribute (discrete) measurement systems** Use appropriate tools and methods (e.g., percent agreement, Kappa, Kendall, intra-class correlation coefficient) to analyze and interpret discrete measurement systems. (Evaluate) **3. Variables (continuous) measurement systems** Use appropriate tools and methods (e.g., $\overline{X} - R$, $\overline{X} - s$, individual and moving range) based on control samples to analyze and interpret continuous measurement systems. (Evaluate) **4. Destructive measurement systems** Use appropriate tools and methods to assess a destructive measurement system. (Analyze) **5. Process capability for non-normal data** Calculate capability using Weibull and other methods for non-normal data. (Apply) **6. Automated process control (APC) and statistical process control (SPC)** Recognize when to use APC instead of or in conjunction with SPC. (Understand)	Revised section name and added new content section 6.A.4., and moved 6.D to this section.
6.B	**B. Measuring and modeling relationships between variables** **1. Autocorrelation and forecasting** Identify autocorrelation, including time-series modeling (e.g., ARIMA) and forecasting. (Analyze) **2. Multiple regression analysis** Apply and interpret multiple regression analysis, including using variance inflation factors (VIFs) to identify collinearity issues. (Analyze) **3. Logistic regression analysis**	Revised cognitive level of 6.B.1 from Understand to Analyze, 6.B.2 from Apply to Analyze, and 6.B.3 from Apply to Analyze.

	Apply and interpret logistic regression analysis, including binary, ordinal, and nominal data considerations. (Analyze) **4. Model fitting for non-linear models** Apply and interpret fits of models that are non-linear in the parameters. (Apply) **5. General linear models (GLM)** Apply and interpret GLMs such as ANOVA results (crossed, nested, and mixed models), simple linear regression, multiple regression, ANCOVA (analysis of covariance) and continuous MSA. (Apply) **6. Components of variation** Select, calculate, and interpret components of variation and nested design studies. (Evaluate) **7. Simulation** Apply simulation tools such as Monte Carlo, dynamic process simulation, and queuing theory. (Apply) **8. Linear programming** Understand how linear programming principles, such as critical path analysis, can be used in modeling diverse types of problems (e.g., planning, routing, scheduling, assignment, design) to optimize system performance. (Understand) **9. Reliability modeling** Use reliability modeling and tools to enhance reliability of a product or process. (Apply) **10. Qualitative analysis** Use appropriate qualitative analysis tools (affinity diagrams, force field analysis) and analyze the results. (Analyze)	
6.C	**C. Design of Experiments (DOE)** **1. Factor relationship diagram** Apply and interpret factor relationship diagrams. (Apply) **2. Complex blocking structures** Recognize other designs for handling more complex blocking structures, including Latin Squares and balanced incomplete block designs (BIBD). (Understand) **3. DOE approaches** Recognize when to apply approaches such as screening designs (including Definitive Screening Designs), response surface methodology (RSM), mixture experiments, evolutionary operations (EVOP), split-plot designs, Taguchi designs and computer-generated designs (e.g. D-optimal designs). (Understand)	Revised name of section 6.C.1, added Latin Squares. Revised name of section 6.C.3.

New Section	**D. Data management and analytics** **1. Enterprise data management** Recognize and understand data management elements such as data governance, data architecture, data lifecycle management, data quality (accuracy, timeliness, consistency, completeness, uniqueness, validity, conformity, precision), meta data, master data, data privacy and data security. (Understand) **2. Data analytics** Recognize when to apply predictive analytic approaches such as decision trees (including random forest, boosted forest), neural networks, partial least squares, text analytics, image recognition and pattern recognition (structured and unstructured data). (Understand)	New section
1.D	**E. DFSS (Design for Six Sigma)** DFSS tools Recognize and understand tools such as QFD, TRIZ, morphology box, and axiomatic design to generate design concepts. (Understand)	Moved from section 1.D and expanded and cognitive level changed from Apply to Understand.
2010 BOK	**2018 BOK Details**	
	ASQ Certified Master Black Belt (MBB) Body of Knowledge **Performance-Based Section − Essay Response**	
PB-1	PB-1. Enterprise-wide Planning Apply project selection criteria to select and prioritize potential improvement projects using strategic planning tools, immediate- and long-term business goals, executive-level directives, and risk analysis results. Develop and deliver formal presentations that support the project selection process, identify progress, and explain its status at conclusion.	Renamed section and revised subtext
PB-2	PB-2. Organizational Competencies for Deployment Use feedback and process data from various sources to identify or develop improvement projects that will respond to customer needs, eliminate process barriers, or streamline processes, especially for managing projects that cross boundaries either within or between organizations. Use appropriate communication methods that are sensitive to specific audiences when explaining projects or solutions, encouraging participation, or resolving issues that arise between interorganizational groups.	Renamed section and revised subtext
PB-3	PB-3. Project Portfolio Management Develop and manage the scope, schedule, cost, and risk of improvement projects using various project management tools to ensure proper monitoring, milestone achievement, and project success. Recognize	Renamed section

	when intervention steps must be taken to bring a project back on track or terminate it based on analysis of internal or external events.	
PB-4	PB-4. Training, Coaching and Mentoring Identify situations that require training or mentoring for all levels of participants in improvement projects, from executive level champions to non-belt participants. Develop, review, and deliver information, training, or mentoring as needed for a variety of improvement projects, based on needs analysis, participant requests, or recognition of situations that require intervention.	Renamed section