ASQ India - QAI
Innovation Practitioner Program Handbook

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Introduction to Innovation Practitioner Program (IPP)

Our academic and professional work environments lay a lot of emphasis on developing soft-skills and technical skills to make for better professionals. Innovative thinking skills has however, not received the same attention of management till the recent past.

The market pressure to differentiate and generate revenues has created an industry need to teach and develop the core skills of innovators that would enable professionals to develop out-of-the-box thinking.

Random idea generation through brainstorming is being replaced with the systematic approach to innovative thinking.

Innovation Practitioner Program (IPP) has been designed to address the industry requirement of teaching and testing on systematic process of thinking based on the seven (7) core skills of innovators.

The program is directed by an independent Technical Committee of ASQ India and Quality Assurance Institute (QAI).

The curriculum, principles and practices as defined by the Technical Committee are outlined in the certification handbook. The Technical Committee will periodically update the handbook to reflect changing industry practices.

Visit the web site for up-to-date information on the IPP, examination sites and schedules, and What's New at:

http://www.qaiglobalinstitute.com/training/bpi/cip/index.html

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Using this document does not constitute, nor imply, the successful passing of the IPP examination.

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1. Innovation Certification Overview

Continual research since the mid-50's has revealed that innovation is a systematic process that can be learnt as well as taught to others.

Innovative ideas are not a random creation of a fertile mind. Innovative thinking requires the mastery of specific skills applied in a systematic manner.

Intelligence Quotient (I.Q.) may influence the pace of the thinking. High creativity may influence the variety of out-of-the-box ideas generated by a person. However, the systematic process of Innovation channelizes the creative energies of an individual in a purposeful manner to generate relevant and useful out-of-the-box ideas of value to the society.

ASQ India -Quality Assurance Institute (QAI) have integrated the specific innovative thinking skills into a curriculum that can be taught and tested. The skills have been mapped to the different cognition levels based on Bloom's Taxonomy.

1.1 Why become certified?

As the industry becomes more competitive, management must be able to distinguish professional and skilled individuals with proven competencies on generating novel ideas to given situation. Certification on innovative thinking skills is an affirmation of the proficiency level of a professional and provides an assurance to the current and would-be employers.

It also provides the certified professional with the necessary tool-set and the systematic process to handle the variety of challenging situations in a much more confident manner.

1.2 Benefits of passing the Innovation Practitioner Program

The IPP will benefit the professionals as below

1. Practitioners from all domains and walks of life will learn the specific skills and the systematic process for generating out-of-the-box thinking that will help them stand out from competition. Certified practitioners will be more attractive to prospective employers who are under a lot of pressure to innovate in the market place.
2. Practitioners of continual improvement frameworks such as Lean Six Sigma will learn how to blend the thinking skills in different phases of the improvement framework to accelerate the process and generate innovative quality solutions.
3. Practitioners from R&D functions will learn the specific skills to identify the niche areas of value to end customers and also the algorithm for resolving the contradictions/conflicting demands in the product development lifecycle.

2. Meeting the IPP Qualifications

To get Innovation Practitioner Certificate of completion, each candidate must:

1. Satisfy all the educational and professional prerequisites prior to applying for candidacy.
2. Subscribe to the Code of Ethics.
3. Submit a completed Certification Candidacy Application.

2.1 Education and Professional Prerequisites

Each candidate must satisfy the educational and professional prerequisites as described below before applying for the IPP.

- A bachelor's degree or diploma from an accredited college-level institution
- Minimum 3 years professional work experience

The candidate must additionally understand what is expected of an IPP certified individual after certification.

2.2 Expectations of the IPP certified candidate -

Knowledge within a profession doesn't stand still. In order to stay current in the field, as knowledge and techniques mature, the certified individual must be actively engaged in professional practice, and seek opportunities to stay aware of, and learn, emerging practices.

Certified professionals are generally expected to:

- Attend professional conferences to stay aware of activities and trends in the profession.
- Take education and training courses to continually update skills and competencies.
- Develop and offer training to share knowledge and skills with other professionals and the public.
- Publish information in order to disseminate personal, project, and research experiences.
- Participate in the profession through active committee memberships and formal special interest groups.

2.3 Code of Ethics

An applicant for certification must subscribe to the following Code of Ethics that outlines the ethical behaviors expected of all certified professionals. Failure to adhere to the requirements of the Code is grounds for decertification of the individual by the Innovation Technical Committee.

2.3.1 Purpose

A distinguishing mark of a profession is acceptance by its members of responsibility to the interests of those it serves. Those certified must maintain high standards of conduct in order to effectively discharge their responsibility.

2.3.2 Responsibility

This Code of Ethics is applicable to all certified by Innovation Technical Committee. Acceptance of any certification designation is a voluntary action. By acceptance, those certified assume an obligation of self-discipline beyond the requirements of laws and regulations.

The standards of conduct set forth in this Code of Ethics provide basic principles in the practice of innovative thinking and innovation management. Those certified should realize that their individual judgment is required in the application of these principles. Those certified shall use their respective designations with discretion and in a dignified manner, fully aware of what the designation denotes. The designation shall also be used in a manner consistent with all statutory requirements.

Those certified who are judged by the Innovation Technical Committee to be in violation of the standards of conduct of the Code of Ethics shall be subject to forfeiture of their designation.

2.3.3 Professional Code of Conduct

Innovation Technical Committee certificate holders shall:

- Exercise honesty, objectivity, and diligence in the performance of their duties and responsibilities.
- Exhibit loyalty in all matters pertaining to the affairs of their organization or to whomever they may be rendering a service. However, they shall not knowingly be party to any illegal or improper activity.
- Not engage in acts or activities that are discreditable to the profession of innovation or their organization.
- Refrain from entering any activity that may be in conflict with the interest of their organization or would prejudice their ability to carry out objectively their duties and responsibilities.
- Not accept anything of value from an employee, client, customer, supplier, or business associate of their organization that would impair, or be presumed to impair, their professional judgment and integrity.
- Undertake only those services that they can reasonably expect to complete with professional competence.
- Be prudent in the use of information acquired in the course of their duties. They shall not use confidential information for any personal gain nor in any manner that would be contrary to law or detrimental to the welfare of their organization.
- Reveal all material facts known to them that, if not revealed, could either distort reports of operation under review or conceal unlawful practices.
- Continually strive for improvement in their proficiency, and in the effectiveness and quality of their service.
- In the practice of their profession, shall be ever mindful of their obligation to maintain the high standards of competence, morality, and dignity promulgated by this Code of Ethics.
- Maintain and improve their professional competency through continuing education.
- Cooperate in the development and interchange of knowledge for mutual professional benefit.
- Maintain high personal standards of moral responsibility, character, and business integrity.

2.3.4 Grounds for Decertification

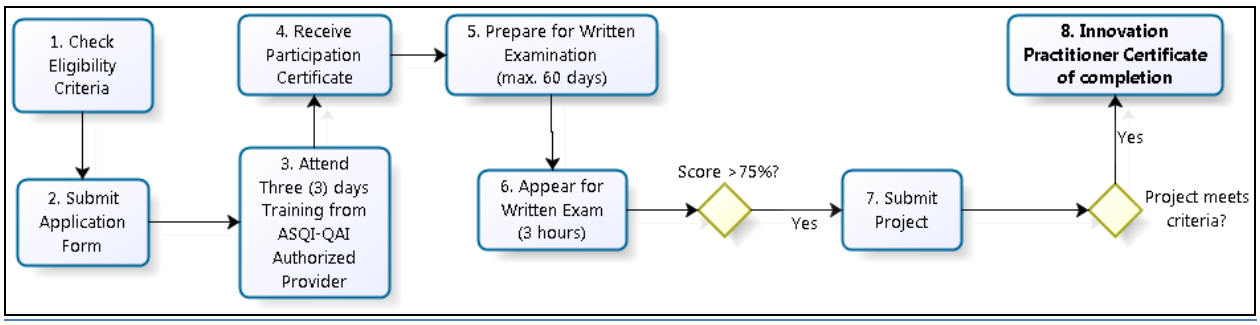
Revocation of a certification, or decertification, results from a candidate failing to reasonably adhere to the policies and procedures of Innovation Certifications as defined by the Innovation Technical Committee. The Committee may revoke certification for the following reasons:

- Falsifying information on the initial application and/or an IPP reporting form,
- Failure to abide by and support the Innovation Certifications Code of Ethics,
- Failure to submit the required continuing education credits toward recertification as required, or
- Failure to submit the required certification and recertification fees as required.

Upon revocation, the candidate is requested to return their current certification credentials. Candidate may appeal a revocation at any time by communicating, in writing, directly with the Committee.

3. IPP Certification Process

Please refer the flowchart below for the steps to be followed for IPP certification process.



1. Each candidate must fulfill the eligibility requirements before applying for the IPP. The eligibility criteria are explained in Section 2 of this handbook.
2. Please refer the IPP website for details of the fees to be paid and the payment options.
3. Candidates who satisfy the eligibility requirements and who have made the payments have to attend a 3-day training program on Seven (7) core skills of innovators from ASQ India-QAI Authorized provider. Please visit IPP website for more details.
4. Candidates who attend the 3-day training program will receive the Innovation Practitioner Participation certificate.
5. After attending the program candidates will have up to 60 days from the date of the training program to prepare for the written certification examination.
6. The written examination will be scheduled by ASQ India-QAI and the updated schedule can be obtained from the IPP website
    a. Candidates who fail to appear for the examination within the 60 days deadline will have to pay additional fees for appearing in the examination. Please refer IPP website for the examination fees.
    b. The written examination will be of 3 hours duration and will comprise of 45 objective type questions. The questions have been mapped to different levels of proficiency based on Bloom's Taxonomy. Please refer Section 4 of this handbook for more details on the curriculum topics and the mapping to the Bloom's Taxonomy.
    c. Candidates have to score more than 75% in the examination
        i. A candidate who fails to score more than 75% in the written examination can appear again whenever the next dates are announced.
        ii. There is no limit to the number of re-examinations a candidate can appear.
        iii. Please refer IPP website for the additional fees to be paid for each re-examination.
7. Candidates who clear the written examination have to work on a real world innovation project to demonstrate the application of the systematic process aligned to the ASQ India-QAI Innovative Thinking Skills Curriculum. Projects must meet the criteria outlined below. Please contact your program facilitator for any additional queries.
    a. Positively impact at least one stakeholder (someone other than the person submitting the project) through a novel solution.
    b. Clearly identify and classify the core issues to be resolved in the given situation
    c. Enumerate the known solutions and the limitations of those solutions in resolving the core issues.
    d. Resolve at least two (2) contradictions or conflicting demands
    e. Demonstrate usage of Resources as per resource selection criteria
    f. Move the process or product closer to Ideality
    g. It is not required for candidates to demonstrate a working solution or prototype. However, the rigor of the systematic process of arriving at the innovative solution has to be demonstrated.

4. IPP Curriculum Topics and Proficiency Levels

Innovation Practitioner Program (IPP) tests for proficiency levels based on Bloom's taxonomy.

4.1 Bloom's Taxonomy of Cognition levels

Bloom's taxonomy details the different proficiency levels of a learner.

The definition of each of the levels is given below.

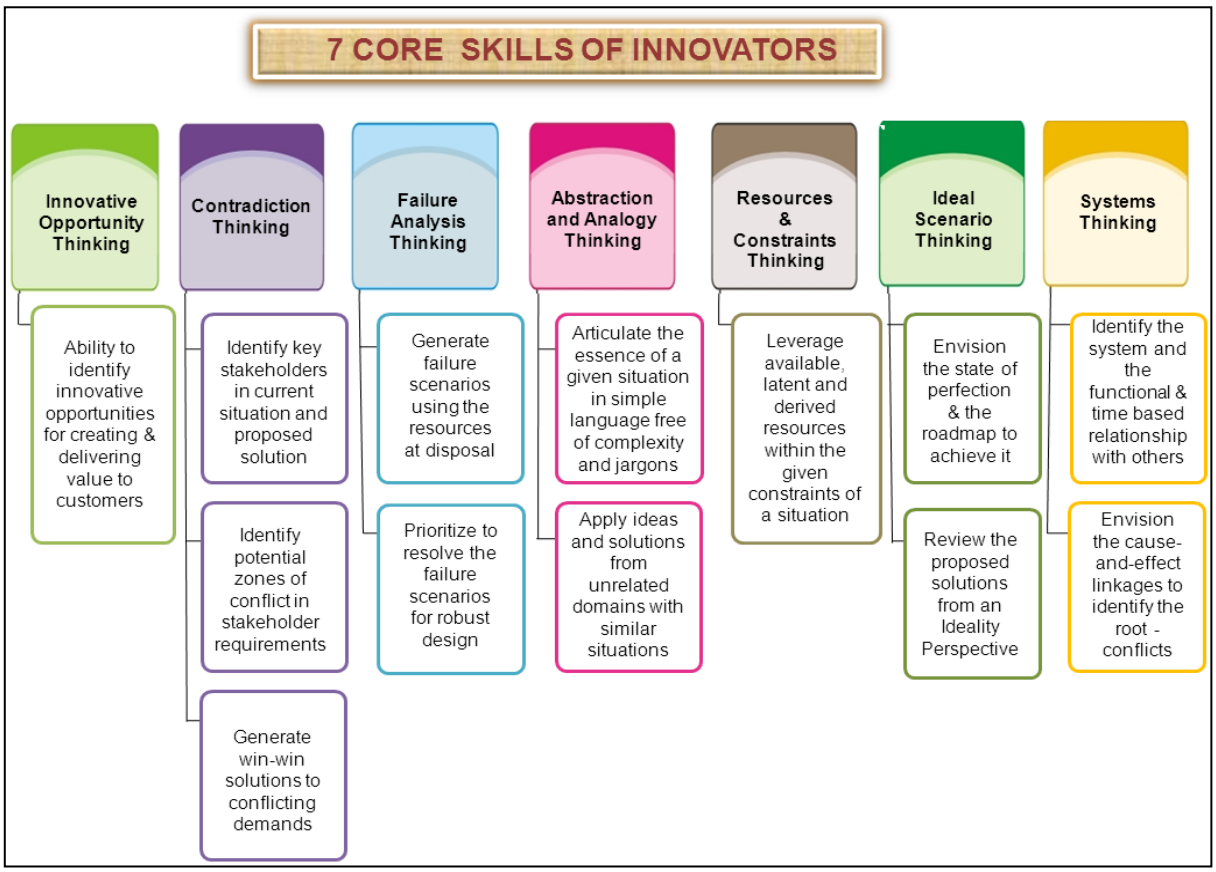
1. **Remember (Knowledge level)**: Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc.
2. **Understand (Comprehension level)**: Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations etc.
3. **Apply (Application level)**: Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc.
4. **Analyze (Analysis level)**: Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario.
5. **Evaluate (Evaluation level)**: Make judgments about the value of proposed ideas, solutions, etc. by comparing the proposal to specific criteria or standards.
6. **Create (Synthesis level)**: Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before, identify which data or information from a complex set are appropriate to examine further or from which supported conclusions can be drawn.

4.2 IPP curriculum categories

The IPP curriculum has three categories of topics on which the proficiency levels will be tested.

1. **Category 1: Right Brain or Creativity Techniques**
    - The topics in this category will train the mind on honing the ability to generate bold ideas.
    - The examination will have 10 questions from this category
2. **Category 2: Basic Terminology of Innovative Thinking skills**
    - The topics in this category will introduce the basic terminology that will help in the structured application of systematic thinking techniques.
    - The examination will have 9 questions from this category
3. **Category 3: Seven (7) core skills of Innovators**
    - Candidates will learn the specific skills and the structured process of systematic application of those skills for innovative thinking. Please refer image below for the seven core skills of innovative thinking used by successful innovators.

- The examination will have 26 questions from this category.



4.3 Mapping IPP Curriculum to Bloom's Taxonomy

4.3.1 Category 1, Right Brain Techniques topics

Topic	Description	Recall: Bloom's taxonomy	Understand: Bloom's taxonomy	Apply: Bloom's taxonomy	Analyze: Bloom's Taxonomy	Evaluate: Bloom's Taxonomy
Types of problems	Difference between Routine problem and Creative Problem	✓	✗	✗	✗	✗
Fantasy Principles	18 principles used by fiction writers	✓	✓	✓	✗	✗
Method of Focal Objects	Apply to generate creative solutions/ ideas	✓	✓	✓	✗	✗
Morphological Analysis	Apply to generate creative solutions/ ideas	✓	✓	✓	✗	✗

The table provides a summary of the topics and the mapping to the Bloom's taxonomy.

4.3.2 Category 2, Basic Terminology topics

The table provides a summary of the topics and the mapping to the Bloom's taxonomy.

Topic	Description	Recall: Bloom's taxonomy	Understand: Bloom's taxonomy	Apply: Bloom's taxonomy	Analyze: Bloom's Taxonomy	Evaluate: Bloom's Taxonomy
Object – Feature – Value (OFV)	Articulate a situation using OFV template	✓	✓	✓	✗	✗
Functions	Types of functions (Primary function, Auxiliary function) and format for writing functions.	✓	✗	✓	✓	✗
Inventive opportunity categories	5 categories of inventive opportunities	✓	✗	✓	✓	✗

4.3.3 Category 3, Seven (7) core skills of Innovators topics

The table provides a summary of the topics and the mapping to the Bloom's taxonomy.

Topic	Description	Recall: Bloom's taxonomy	Understand: Bloom's taxonomy	Apply: Bloom's taxonomy	Analyze: Bloom's Taxonomy	Evaluate: Bloom's Taxonomy
Customer Value Creation	Identify the value creation opportunities for innovation	✓	✓	✓	✓	✓
Abstraction and Analogy Thinking	Map the solutions from an analogous situation to the given situation	✗	✗	✓	✗	✗
Ideality	Envision the state of perfection for any given situation. Apply Ideality as a key criteria for evaluating solutions.	✓	✓	✓	✓	✓
Contradictio n thinking	Apply 5-step algorithm to generate win-win solutions	✓	✓	✓	✓	✓
Express Failure Analysis	Anticipate failure to innovatively perform root-cause analysis and for robust design of solutions	✓	✗	✓	✓	✓
Resource Thinking	Systematic approach to identify resources to generate innovative solutions	✗	✗	✓	✓	✓
Systems Thinking	Multi-dimensional perspective of systems	✗	✗	✓	✓	✓

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Description of Concepts

Skill Category 1 - Right Brain Techniques

1.1 Types of Problems

Not every situation requires innovative thinking. Practitioners must be able to identify situations that need out-of-the-box thinking from others that do not require such level of thinking to make the process more efficient and effective.

1.2 Fantasy Principles

Fiction writers have over time consistently made use of principles of fantasy in their creations. Practitioners must understand and apply the eighteen (18) principles to generate bold ideas.

Advanced level Practitioners can even apply these principles to real world situations to generate bold, yet workable solutions.

1.3 Method of Focal Objects (MFO)

Method of Focal Objects is a creativity technique for generating new objects (products/processes/fantasy objects) through transfer of values of chosen characteristics from other randomly selected objects.

It will help Practitioners explore alternative solutions/directions of improvement for the focal object.

1.4 Morphological Analysis (MA)

Morphological Analysis (MA) brings a certain level of systematic approach to search for different variants of a selected object.

MA technique can help an innovator explore different combinations of characteristics and their associated values to generate novel and bold ideas.

Skill Category 2 - Basic Terminology

2.1 Object-Feature-Value (OFV)

The understanding of Object-Feature-Value will help innovators define useful and harmful functions, articulate contradictions or conflicting demands, and identify the desired characteristics of the resources to implement novel ideas.

2.2 Functions

Function is the change in the value of a feature of a chosen object.

Functions are of different types: useful functions/ harmful functions/ auxiliary functions.

Understanding of language of functions will help in making use of other techniques such as Ideality thinking, Systems thinking.

2.3 Inventive Opportunity categories

All the inventive ideas generated till date can be classified into one of the five (5) categories. Understanding of those categories will help in channelizing the directions of improvement for an innovator in any situation.

Skill Category 3 - Seven core skills of innovators

3.1 Customer value creation

Innovation is the ability to generate useful and novel ideas that are accepted and adopted by the target customer.

One of the first hurdles faced by innovators is the answer to the question: “Where to innovate?”

Customer value creation skill is the systematic technique to identify the innovation opportunities.

3.2 Abstraction and Analogy thinking

Innovators face many psychological hurdles that make their situation incorrectly appear as uniquely different from the situation faced by innovators from other domains. Technical jargons and imagery are some of those psychological biases that cloud the thinking to make the given situation look different from the situation faced by others.

Abstraction is the ability to de-jargonize the given situation and express the essence in simple language so that the situation does not appear to be uniquely different from those faced by others.

Analogy thinking is the ability to map the solutions used by other innovators to the given situation.

Abstraction and Analogy thinking is the process of not reinventing the wheel when innovative ideas can be simply adapted from other domains facing similar situations.

3.3 Ideality thinking

Ideality thinking is the ability to define the state of perfection for any product, service, process or situation based on the language of functions.

It establishes the roadmap for improvement as Ideality is the benchmark of what future should be.

Envisioning the state of perfection helps the innovator identify the gap with respect to the current position and chart the roadmap of innovative solutions.

3.4 Contradiction thinking

At the heart of the most powerful innovative ideas is the ability to generate win-win solutions to conflicting or contradictory requirements.

Successful innovators have the ability to identify, articulate and resolve a contradiction using a systematic algorithm based on proven principles.

Untrained minds go for suboptimal thinking such as compromise or tradeoff.

3.5 Express Failure Analysis

Innovators have to train themselves to anticipate and handle different types of situations. One type of situation is called “failure analysis” where a failure of a design/solution is evident but what causes the failure is unknown.

Express failure analysis is the ability to quickly identify the potential hypotheses that could be leading to the unfavorable situation.

Advanced applications of this concept can be used to anticipate and prevent failures in current as well as future designs/solutions. This is especially useful in blending with other risk mitigation procedures.

3.6 Resource Thinking

Resource thinking is the foundation without which no innovative idea would see the light of the day. Successful innovators have the uncanny ability to systematically explore and identify resources that are typically not considered by others on account of various types of psychological biases.

3.7 Systems Thinking

Systems thinking is the ability to analyze the given systems to understand how it functions, the cause-and-effect relationships governing the system in the given situation, and the relationship of a given system within the context of other systems and sub-systems.

Systems thinking enable the innovators to go to the core issues that need to be resolved in a given situation from a value creation perspective.

It also helps them systematically identify the resources available to make their ideas a reality.

Finally, it aligns any improvements with the inter-linkages between the system and its environment and the known patterns of technical system evolution to ensure the sustainability of the solutions.

References

It is each candidate's responsibility to stay current in the field and to be aware of published works and materials. The references are for informational purposes only.

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