

April 4 2020

Quality Standards Catalogue

Bhadale Group of Companies

Bhadale Group of Companies consists of Bhadale IT Developers Pvt. Ltd and Bhadale Real Estate Developers Pvt Ltd.

1. Bhadale IT Developers Pvt. Ltd is an IT and Computer Engineering company

This company provides consultation in areas of cutting edge technologies, research outsourcing, and software consultation related to data center and related engineering practices

2. **Bhadale Real Estate Developers Pvt. Ltd** is a Real estate company

This company provides development of commercial, residential and farm based developments. It manages the renting and lease of the real estate properties

Bhadale Group of Companies has aggressive programs in place to serve the niche market. Below are the proposed quality standards for each specialty.

Quality is a necessity even for one person, small company that serves one small service. This helps gain recognition and gain approvals from clients and faster clearances at various places. Currently, we need a QA system to maintain licenses, chartered status for our engineers. We may have limited ERP systems for corporate matters, however QA is first choice

QA is required for software engineering and systems engineering practices. Standards are part of the QA and surely for all new offers, R&D, newer areas when clients are not sure, QA helps them to gain confidence, in areas of AI, Quantum, Nanotechnologies, and related engineering systems used

With so many offering how will you provide tools/ docs for so many standards and products? Excels sheets given as part of training or appraisals, implementation are fine; however these excel-sheets need to be made digital, automated and there is a need to have a datacenter edition in-house to take care of all these standards keyed into the digital world. How are these then applied to various projects, clients etc, then these should be made cloud enabled apps that are like micro-services and these are then be able to offer outsourced to client. We retain the IP and ownership as a partner with OEM/ ISO/ CMMI etc. Is this not offering cloud platforms for various industries with our own unique solution packages? Yes this is a great opportunity, please use this. This can be a post partnership project

ICT practices have used many ISO standards such as ISO 9001 QMS, ISO 20000 ITSM, ISO 27001 ISMS and other standards. For example, ISO 9001 QMS helps bring out the best in organizations by enabling people to understand the processes of delivering products/services to customers. ISO's Quality Management System is a model for continual improvement and customer satisfaction, and any organization looking to improve how it functions or does business can use it, regardless of size or sector. ISO 20000 ITSM promotes the adoption of an integrated process approach for effectively delivered managed services to meet business and customer requirements. To take another example, ISO 27001 ISMS provides information to responsible parties for establishing, implementing, operating, monitoring, reviewing, maintaining and improving a documented Information Security Management Systems (ISMS)

ISO has worked hard to improve ICT companies' operations such as developing Standardization and Innovation in IT (SIIT). It aims to promote interdisciplinary research about ICT standardization

ISO created standards that have impacted on engineering and safety such as ISO 12000 Standard Family, ISO Standard 13849 and ISO 9000 Standard Family. ISO 12100-1 is titled Safety of Machinery, Basic Terminology and Methodology, while ISO 12100-2 is called Safety of Machinery Technical Provisions. ISO standard 12100 parts 1 and 2 provide engineering guidelines to maximize a product's safety. ISO Standard 12121 defines how safety risk assessments are performed. ISO 13849 is known as Safety Related Parts of Control Systems. ISO Standard 13849 provides safety

requirements for the design of safety-related parts of control systems for any type of machinery (Wilhite, 2010).Linked to its work in engineering practice is ISO's research into Quality Assurance. One of these quality system standards is the ISO 9000 standard, which has been adopted by many countries and is applied in engineering and construction. It is important in the engineering and construction industry because of the risks involved in any project

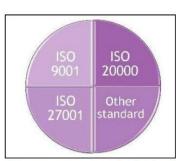


Fig. 3: Management Systems (Meskovska, Ohrid and Partners Consulting 2009).

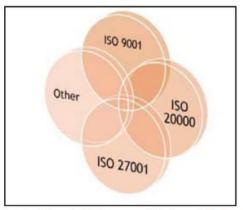


Fig. 4: Integrated Management Systems (Meskovska, Trajkovski and Partners Consulting, 2009).

https://www.intelex.com/landing/iso-9001-quality-management-software-system

70 University Avenue, Suite 800 Toronto, ON M5J 2M4 Canada

- intelex@intelex.com
- 416 599 6009
- 1877 932 3747

https://www.itqlick.com/intelex-ehs/pricing

https://reviews.financesonline.com/p/intelex/

https://www.getapp.com/operations-management-software/quality-management/

https://www.capterra.com/quality-management-software/

https://www.advanceinnovationgroup.com/qms-consulting/

https://core-compliance.com/iso-9001-consulting-services-canada

https://www.theisoedge.com/consulting/

https://www.capterra.com/quality-management-software/

Quantum

https://www.insightsassociation.org/get-support/iso-research-standards-20252-26362

https://en.wikipedia.org/wiki/ISO 20252

https://www.iso.org/committee/45086.html

https://www.npl.co.uk/news/2017/graphene-iso-standard

https://x9.org/wp-content/uploads/2019/03/X9_Quantum-Computing-Risk-Study-2019-02-14-finalS1.pdf

ISO/IEC 18031:2011(en)

Information technology — Security techniques — Random bit generation

ISO/IEC 10744:1997(en)

Information technology — Hypermedia/Time-based Structuring Language (HyTime)

Post Quantum Cryptography based standards, algorithms that are safe from quantum hacking

http://www.iss.com/resources/reference/data_tables/FL_QuantumYieldStandards.html

https://www.etsi.org/technologies/quantum-safe-cryptography

https://www.isara.com/standards/

https://www.npl.co.uk/quantum-detection/electrical-si

https://quantum.ieee.org/standards

IEEE: Current Quantum Standards Efforts

The following quantum standards efforts are now active:

P1913 - Software-Defined Quantum Communication

<u>P7130 - Standard for Quantum Computing Definitions</u>

P7131 - Standard for Quantum Computing Performance Metrics & Performance Benchmarking

https://www.nist.gov/pml/2000-and-later-history-nist-quantum-voltage-standards

Nano

https://www.nano.gov/you/standards

Illustrative examples of documentary standards available for nanomaterials are listed in the table below. For a comprehensive list of nanotechnology-related standards, please visit each organization's website.

Topic	Unique Identifier	Title
Terminology	ASTM E2909-13	Standard Guide for Investigation/Study/Assay Tab-Delimited Format for Nanotechnologies (ISA-TAB-Nano): Standard File Format for the Submission and Exchange of Data on Nanomaterials and Characterizations
	ISO/TS 80004-1:2010	Nanotechnologies Vocabulary Part 1: Core terms
Measurement	ASTM E2490-09(2015)	Standard Guide for Measurement of Particle Size Distribution of Nanomaterials in Suspension by Photon Correlation Spectroscopy (PCS)
	ISO/TR 13014:2012	Nanotechnologies Guidance on physico-chemical characterization of engineered nanoscale materials for toxicologic assessment
EHS Effects	ASTM E2524-08(2013)	Standard Test Method for Analysis of Hemolytic Properties of Nanoparticles
	ISO/TS 12901-1:2012	Nanotechnologies Occupational risk management applied to engineered nanomaterials Part 1: Principles and approaches
Education	ASTM E2996-15	Standard Guide for Workforce Education in Nanotechnology Health and Safety

Topic	Unique Identifier	Title
Terminology	ASTM E2909-13	Standard Guide for Investigation/Study/Assay Tab-Delimited Format for Nanotechnologies (ISA-TAB-Nano): Standard File Format for the Submission and Exchange of Data on Nanomaterials and Characterizations
	ISO/TS 80004-1:2010	Nanotechnologies Vocabulary Part 1: Core terms
Measurement	ASTM E2490-09(2015)	Standard Guide for Measurement of Particle Size Distribution of Nanomaterials in Suspension by Photon Correlation Spectroscopy (PCS)
	ISO/TR 13014:2012	Nanotechnologies Guidance on physico-chemical characterization of

		·
		engineered nanoscale materials for toxicologic assessment
EHS Effects	ASTM E2524-08(2013)	Standard Test Method for Analysis of Hemolytic Properties of Nanoparticles
	ISO/TS 12901-1:2012	Nanotechnologies Occupational risk management applied to engineered nanomaterials Part 1: Principles and approaches
Education	ASTM E2996-15	Standard Guide for Workforce Education in Nanotechnology Health and Safety

Around the world, there are numerous standards-setting groups that are involved in developing nanotechnology standards. Some of the leading standards setting organizations and their relevant nanotechnology committees are (in no particular order):

- International Standardization Organization (ISO) Technical Committee (TC) 229 on Nanotechnologies
- <u>ASTM International's Committee E56 (Nanotechnology)</u> (formerly known as the American Society for Testing and Materials)
- <u>International Electrotechnical Commission Technical Committee 113</u> (Nanotechnology Standardization for Electrical and Electronics Products and Systems)
- Institute of Electrical and Electronics Engineers' Nanotechnology Council

These groups develop *voluntary* standards. Standards that are the best formulated, with the strongest basis in science, are most likely to be adopted by the global community. U.S. leadership and participation in the international standards-setting process allows the United States to help shape the strategic and technical direction of nanotechnology development everywhere. Additionally, other groups are involved in coordinating the development of standards, such as the American National Standards Institute (ANSI), which hosts a Nanotechnology Standards Database and accredits organizations involved in standards.

U.S. Federal Government research related to measurement within science and technology is led by the <u>National Institute of Standards and Technology</u> (NIST). NIST representatives lead ASTM International's <u>Committee E56 on Nanotechnology</u>. A U.S. Technical Advisory Group (TAG) (accredited by ANSI) represents the United States at <u>ISO TC 229</u>, <u>Nanotechnologies</u>. The TAG is responsible for formulating positions and proposals on behalf of the United States with regard to ISO standardization activities related to nanotechnology. The U.S. also holds leadership of ISO TC 229's <u>Working Group 3: Health, Safety and Environmental Aspects of Nanotechnologies</u>, with a representative from The National Institute for Occupational Safety and Health (NIOSH).

https://www.iso.org/obp/ui/#iso:std:iso:tr:16197:ed-1:v1:en

ISO/TR 16197:2014(en)

Nanotechnologies — Compilation and description of toxicological screening methods for manufactured nanomaterials https://www.iso.org/standard/68058.html

https://www.iso.org/committee/381983/x/catalogue/

https://www.iso.org/contents/data/standard/05/98/59853.html - Quantum dot

https://www.iso.org/contents/data/standard/06/67/66782.html - Graphene

https://www.iso.org/standard/64741.html - Graphene

https://www.iso.org/standard/66188.html - Graphene

https://www.iso.org/standard/66188.html Nano tubes

https://www.iso.org/standard/69546.html - Nanotubes

https://www.iso.org/standard/66238.html - Nanotubes

https://www.iso.org/standard/75639.html - Nanotubes

https://www.iso.org/contents/data/standard/06/95/69549.html - MW CNT

https://www.iso.org/contents/news/2013/12/Ref1806.html - Nanotubes

https://www.iso.org/contents/data/standard/05/21/52125.html -

https://www.iso.org/contents/data/standard/05/33/53375.html

https://www.iso.org/contents/data/standard/06/82/68243.html

https://www.iso.org/contents/data/organization/59/84/5984715.html

https://www.iso.org/contents/data/standard/06/30/63095.html

https://www.iso.org/contents/data/standard/07/31/73132.html

https://www.iso.org/contents/data/standard/06/87/68771.html

https://www.iso.org/contents/data/standard/05/17/51766.html

https://www.iso.org/contents/data/standard/05/43/54315.html

https://www.iso.org/contents/data/standard/05/59/55967.html

https://www.iso.org/contents/data/standard/06/30/63095.html

https://www.iso.org/contents/data/standard/06/29/62945.html

https://www.iso.org/contents/data/standard/05/29/52937.html

Research

https://www.iso.org/contents/data/standard/07/59/75931.html

https://www.iso.org/contents/data/standard/06/99/69921.html

https://www.iso.org/standard/62633.html

https://www.iso.org/contents/data/standard/06/26/62639.html

https://www.iso.org/contents/data/standard/06/36/63611.html

ΑI

https://www.iso.org/contents/data/standard/07/42/74296.html

https://www.iso.org/contents/data/standard/07/76/77609.html

https://www.iso.org/contents/data/standard/07/44/74438.html

https://www.iso.org/contents/data/standard/07/85/78508.html

https://www.iso.org/contents/data/standard/07/85/78507.html

https://www.iso.org/contents/data/standard/07/76/77610.html

https://www.iso.org/standard/77608.html

https://www.iso.org/standard/77607.html

https://www.iso.org/contents/data/standard/05/66/56641.html

Robots

https://www.iso.org/contents/data/standard/07/27/72715.html

https://www.iso.org/contents/data/standard/07/16/71627.html

https://www.iso.org/standard/76577.html

Biology + Nano

https://www.iso.org/contents/data/standard/07/30/73049.html

https://www.iso.org/contents/data/standard/06/59/65918.html

https://www.iso.org/contents/data/standard/05/17/51767.html

https://www.iso.org/contents/data/standard/05/58/55826.html

https://w5.siemens.com/italy/web/AD/ProdottieSoluzioni/Sistemiautomazionenew/SafetyIntegrated/Documents/RiskAssessment WEB.pdf

https://www.cmafh.com/enewsletter/PDFs/Machine Safety Risk%20Assessment SafetyII.pdf

https://www.tuv-sud.co.uk/uploads/images/1379673832283654260118/functional-safety-of-machinery-stewart-

robinson.pdf

https://content2.smcetech.com/pdf/ISO13849-1 EU.pdf

https://www.tuv-sud.co.uk/uploads/images/1381157171630831570066/machine-guarding.pdf

http://www.iso-iran.ir/standards/iso/ISO%2017021-2011.pdf

http://qic-eg.com/wp-content/uploads/2015/08/ISO-17020-2012.pdf

https://www.trustedcomputinggroup.org/wp-content/uploads/TPM-2-0-Mobile-Reference-Architecture-v2-r142-Specification FINAL2.pdf

Cloud

http://www.cloud-council.org/webinars/CSCC-Webinar-ISO-Cloud-Security-and-Privacy-Standards-5-28-15.pdf

http://www.cis-cert.com/Pages/com/System-Zertifizierung/Cloud-Computing/Service-quality/ISO-20000-9/Contents-of-

the-Standard-ISO-20000-9.aspx

https://www.iso27001security.com/html/27017.html

https://www.itu.int/en/ITU-T/Workshops-and-Seminars/standardization/201603/Documents/Abstracts-

Presentations/S4P4 Jamil Chawki.pdf

http://www.cloud-council.org/CSCC-Practical-Guide-to-PaaS.pdf

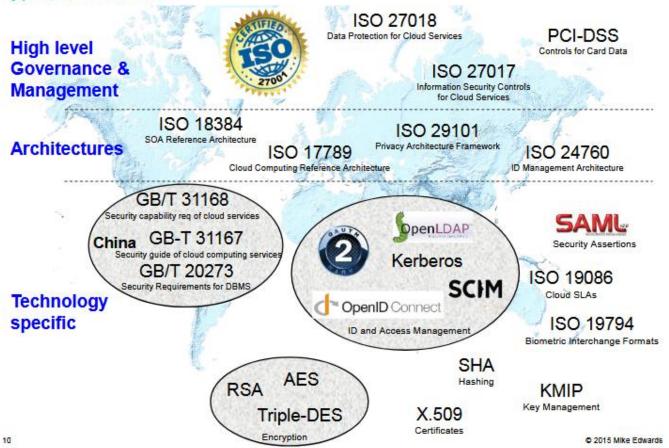
https://www.iso27001security.com/ISO27k_Standards_listing.pdf

https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1003&context=lib_fspres

https://www.forensicnotes.com/iso-17025-right-for-digital-forensics/

https://www.dvb.org/resources/public/standards/a168_dvb_mpeg-dash_feb_2019.pdf

Types of Standards



ISO Cloud Computing standards

- 17788: Cloud computing Overview and Vocabulary*
- 17789: Cloud computing Reference Architecture*
- 19086: Cloud computing SLAs
- 19941: Cloud computing Interoperability & Portability
- 19944: Cloud computing Data Flow across devices & cloud services
- 27001: Information security management systems Requirements
- 27002: Code of practice for information security controls
- 27017: Guidelines on Information security controls for the use of cloud computing services based on ISO/IEC 27002*
- 27018: Code of practice for data protection controls for public cloud computing services

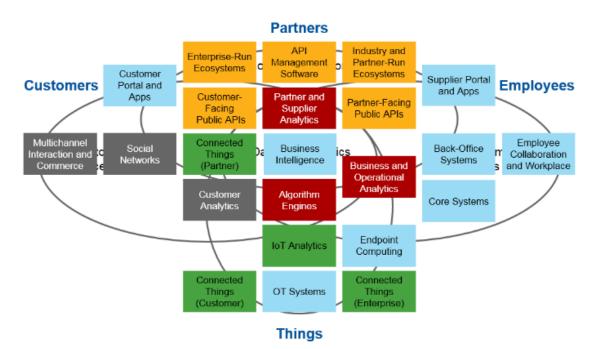


Figure 7. Digital Business Technology Platform

Reference: Refer Gartner: esc28_digitalbusiness.pdf - public link

Chatbots:

https://arxiv.org/ftp/arxiv/papers/1704/1704.04579.pdf

Microservices

https://www.owasp.org/images/2/20/Microservice Security.pdf https://www.manning.com/books/testing-microservices-with-mountebank https://wso2.com/whitepapers/microservices-in-practice-key-architectural-concepts-of-an-msa/

Systems Engineering

https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-160v1.pdf

https://www.nist.gov/nist-quality-system

https://csrc.nist.gov/csrc/media/projects/forum/documents/2012/october-2012 fcsm-jjarzombek.pdf

Software Engineering

http://www.sqa.net/iso9126.html

VR and AR

https://www.ecnmag.com/news/2018/05/nist-virtual-reality-aims-win-public-safety

https://www.researchgate.net/profile/Marcelo Guimaraes8/publication/286562759 A Checklist to Evaluate Augmen ted Reality Applications/links/56b249ab08ae56d7b06cb3f8.pdf?origin=publication list

APPLICATION OF ISO9241-11 TO AR

Block Chain

https://csrc.nist.gov/csrc/media/projects/supply-chain-risk-management/documents/ssca/2016-fall/wed am2-

block chain john kelsey.pdf

https://csrc.nist.gov/csrc/media/publications/nistir/8202/draft/documents/nistir8202-draft.pdf

https://www.iso.org/committee/6266604.html

ISO/TC 307 - Blockchain and distributed ledger technologies

RPA

ToDo

Robots and Autonomous systems

https://ws680.nist.gov/publication/get_pdf.cfm?pub_id=911827

There exist several general robotics standards that have been considered in the standardization of service robots.

- •ISO 8373:1994, ISO 9787:1999, ISO 11593:1996, ISO 14539:2000, for industrial robotics. (Under revision to include Service Robots);
- ASTM International E2521-07, for Urban Search and Rescue Robotic Operations;
- •AIAA (American Institute for Aeronautics and Astronautics: S-066-1995, for Space Automation and Robotics;
- •JIS (Japanese Industrial Standard) B 0144:2000, JIS B 0185:2002, JIS B 0186:2003, JIS B 0187:2005, TR B 0010:1999, for Assembly, Intelligent, Mobile, Service, and Personal Robots

https://www.iso.org/committee/5915511/x/catalogue/

ISO 10218-1:2011

Robots and robotic devices -- Safety requirements for industrial robots -- Part 1: Robots

ISO/CD 10218-1 [Under development]

Robots and robotic devices -- Safety requirements for industrial robots -- Part 1: Robots

ISO 10218-2:2011

Robots and robotic devices -- Safety requirements for industrial robots -- Part 2: Robot systems and integration

ISO/CD 10218-2 [Under development]

Robots and robotic devices -- Safety requirements for industrial robots -- Part 2: Robot systems and integration

ISO/TS 15066:2016

Robots and robotic devices -- Collaborative robots

ISO 18646-1:2016

Robotics -- Performance criteria and related test methods for service robots -- Part 1: Locomotion for wheeled robots

ISO 18646-2:2019

Robotics -- Performance criteria and related test methods for service robots -- Part 2: Navigation

ISO/CD 18646-3 [Under development]

Robotics -- Performance criteria and related test methods for service robots -- Part 3: Manipulation

ISO/CD 18646-4 [Under development]

Robotics -- Performance criteria and related test methods for service robots -- Part 4: Lumbar support robots

IOT

https://www.iso.org/standard/65695.html

https://www.iso.org/news/ref2340.html

<u>ISO/IEC 30141</u>, *Internet of Things (IoT) – Reference architecture*, provides an internationally standardized IoT Reference Architecture using a common vocabulary, reusable designs and industry best practice.

https://www.postscapes.com/internet-of-things-protocols/

https://www.ntia.doc.gov/files/ntia/publications/iotsecuritystandardscatalog.pdf

https://www.nist.gov/programs-projects/nist-cybersecurity-iot-program

IoT Cybersecurity-Related Initiatives at NIST

The Cybersecurity for IoT program supports and builds off existing initiatives at NIST.

- BLE Bluetooth | more
- Cloud security | more
- Cyber Threat Information Sharing | more
- Cybersecurity for Cyber Physical Systems | more
- Cybersecurity for Smart Grid Systems | more
- Cybersecurity Framework | more
- Cybersecurity Framework Profile for Manufacturing | more
- Digital Identity Guidelines | more
- Galois IoT Authentication & PDS Pilot | more
- GSMA Trusted Identities Pilot | more
- Guide to Industrial Control Systems (ICS) Security | more
- Lightweight Encryption | more
- Low Power Wide Area IoT | more
- Mitigating IoT-Based DDoS/Botnet Report | more
- National Vulnerability Database | more
- NCCoE IoT-Based Automated Distributed Threats | more
- NCCoE Use Case: Capabilities Assessment for Securing Manufacturing Industrial Control Systems | more
- Network of Things | more
- Privacy Engineering Program | more
- Report on State of International Cybersecurity Standards for IoT | more
- RFID Security Guidelines | more
- Security and privacy concerns of intelligent virtual assistances | more
- Security Content Automation Protocol (SCAP) Standards and Guidelines | more
- Security of Interactive and Automated Access Management Using Secure Shell (SSH) | more
- Security Systems Engineering | more
- Software Assessment Management Standards and Guidelines | more

- Supply Chain Risk Management | more
- Vehicle-to-vehicle transportation
- Wireless Medical Infusion Pumps | more

Civil Engg

https://www.iso.org/ics/93/x/

https://www.iso.org/committee/49070.html

ISO/TC 59 Buildings and civil engineering works

http://web.cvut.cz/ki/710/pdf/1812.pdf

https://faculty.mercer.edu/jenkins_he/documents/EngineeringStandardsfor487.pdf

Electrical

https://www.iso.org/ics/29/x/

https://www.nrc.gov/docs/ML1025/ML102530301.pdf

Mechanical

https://www.iso.org/committee/46064/x/catalogue/

Big Data

https://www.dataqualitypro.com/iso-8000-new-international-standard-data-quality/

Data Center

KPI (ToDo)

SO/IEC 30134-1:2016

SO/IEC 30134-2:2016

Bio-technology systems

http://erc.ncat.edu/public/ISO%2010933/ISO 10993-6.pdf

https://jasperin.org/wp-content/uploads/2016/10/ISO13485 QualityManagementSystemsStandard.pdf

ISO 13485 - design and manufacture of medical devices

ERP systems:

Need to meet International quality and multi country payroll, HRMS and contract management

https://www.workday.com/en-us/applications/human-capital-management/payroll.html - \$100 / emp / 3 years http://www.peopleapex.com/contactus#

https://www.workday.com/en-us/forms/reports/report-gartner-financial-management-magic-quadrant.html -workday no office in India

Oracle ERP cloud and Workday are only leaders- Cloud financials

 $\underline{https://www.gartner.com/reviews/market/cloud-core-financial-management-suites-for-midsize-large-and-global-glo$

enterprises/compare/oracle-vs-workday-hcm

https://comparisons.financesonline.com/workday-vs-oracle-hcm-cloud

https://fitsmallbusiness.com/reviews/hr-software-reviews/

BambooHR - no inbuilt payroll - has plugins

Oracle ERP cloud is good https://www.oracle.com/in/smb/ - has offices in India, US, Canada, and all major countries where work is expected

https://www.oracle.com/in/smb/finance.html

https://tech.economictimes.indiatimes.com/news/corporate/oracles-gst-compliant-erp-cloud-now-available-in-india/58591048

https://www.merchantmaverick.com/the-best-accounting-programs-for-international-business/

Quick Books online is another good one

Aeronautics / Govt. / Startups for Govt initiatives

Tech Readiness Level - Assessments (Level 1 to 9) - ISO 16290:2013

TPMM – Technology program management model

NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements - Refer NASA's System Engineering Handbook for further details

https://en.wikipedia.org/wiki/Technology_readiness_level

https://www.anser.org/contact/

https://www.tuv-sud.ca/ca-en/services-by-activity/certification/product-certification - IMP

https://www.nqa.com/en-ca/certification/standards/iso-9001

https://www.nga.com/en-ca/certification/sectors/small-business

https://www.cwbgroup.org/iso-registration

https://corporateprimesolutions.com/contact-us/

https://www.saiglobal.com/contact/

https://www.omnex.com/about/about.aspx

https://asq.org/training/catalog/topics/iso-9000

https://www.bdc.ca/en/articles-tools/operations/iso-other-certifications/pages/iso-certificate-process.aspx

https://www.bsigroup.com/en-CA/iso-9001-quality-management/ISO-9001-Certification/

https://www.smartsheet.com/iso-9000-certifications-and-training

https://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/programme-program/management/iso/qms/index-eng.html

https://www.orioncan.com/en/iso-standards

ISO 9001 needs min investment of \$10,000

In summary, this is a draft version with references from publically available material.

Bhadale Group of Companies

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Contact

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