BHADALE GROUP OF COMPANIES - IT AND REAL ESTATE

Jan 18 2023

Quantum Engineering Technologies Catalogue

Bhadale IT Pvt. Ltd. (**https://www.bhadaleit.com/**)

Bhadale Group of Companies

Bhadale Group of Companies consists of:

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

   This division provides consultation in areas of cutting edge technologies, research outsourcing, and software consultation related to data center and related engineering practices
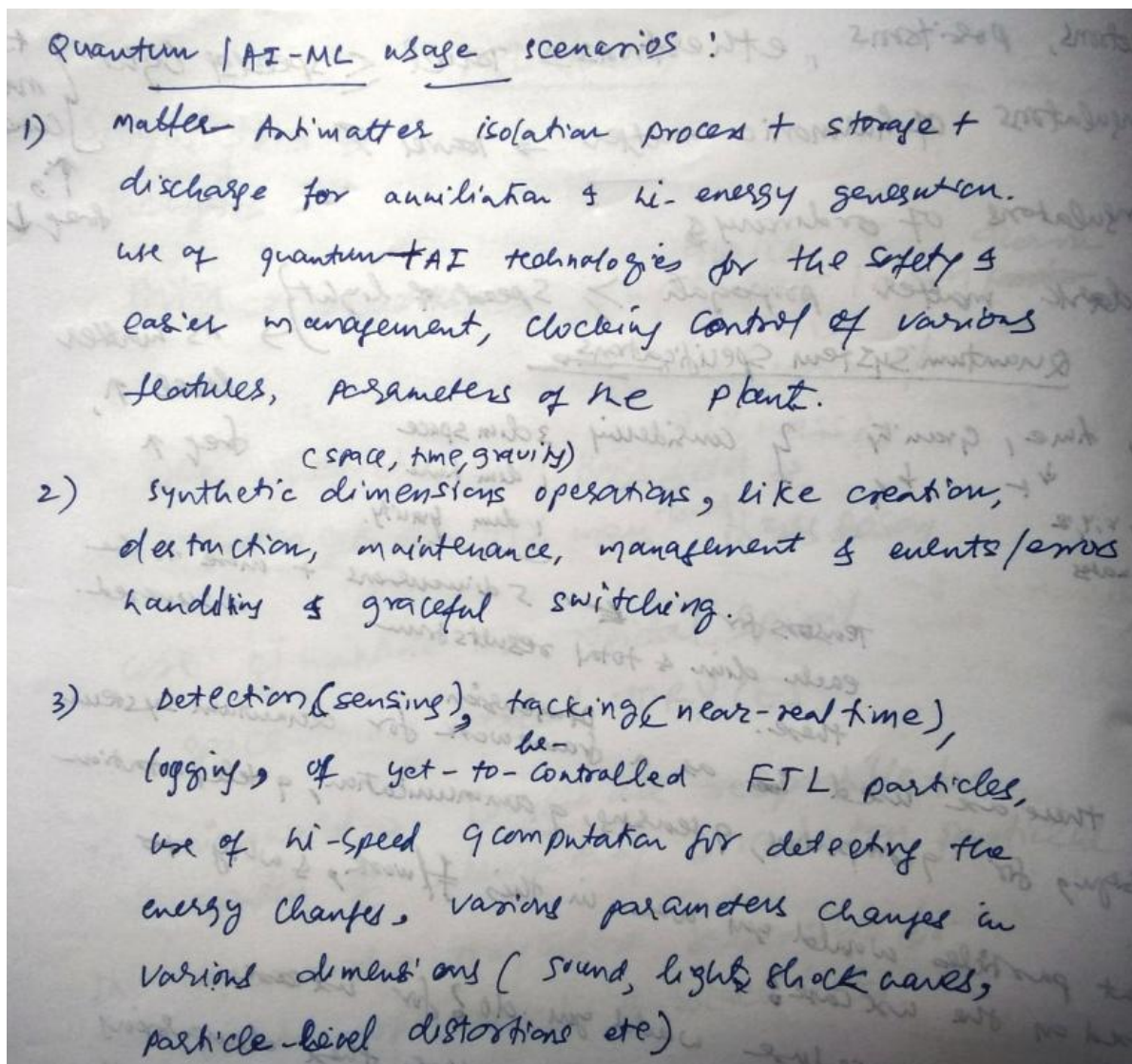
2. **Bhadale Engineering Pvt. Ltd** is a multi-engineering subsidiary company

Bhadale Group has aggressive programs in place to serve the niche market. Below is related to cloud ecosystems

Bhadale Group Engineering Division, Quantum Engineering department

 This catalogue offers an overview of the various quantum technologies available in the market. These are broadly classified based on the technology used like electronics, photons, magnons and plasmons which are represented by the femionic, bosonic and magnonic systems and follow the principles from various disciplines like physics, nanotechnology, magnetism, and optics. Here we discuss the key technologies used in quantum computing

Various use cases are show that shows what use case we can attend.

Particle-level *(unclear)*

AI/ML

4) Decision-making intelligent control, inference engines for control mechanics of various complex systems / SoS, that have real-time tracking, control of quantum particles, computational needs & dynamic operations.

5) Assembly, analysis of large chunks of offloaded operational data from various systems, with varying duty cycles, SNR, entropies, from various modulated signals & protocols.

6) Differential load-balancing in real-time of various operational needs of complex systems, using big-data & intelligent mined SQL/NoSQL data. example data of 1 billion user data → voice / non-voice / Internet website usage, hacking attempts, DoS attack detections in cloud / or massive system

7) Study of Climatic change data from various regional, national & international resources, agencies in terms of petabytes to analyse, predict, recommend remedies ensuring sustainability of ecosystems on earth

8) Study of DNA, biological synthesis of artificial parts with genetic corrections for any defects in a phased design & development lab for later on mass production for replacements & unique body suitability analysis & testing.

9) Study of Cosmological data, deep space data, near-earth objects, meteors & nearby planetary data to analyse, predict any threats impeding upon earth using quantum, AI/ML & related technologies.

10) Study of chemicals for newer unique medicines at each individual level with common base material + unique chemicals, allowing dosage, particular mix of medicines enabling faster recovery from diseases

11) Study of economic conditions, international matters, corruption, inflation, devaluation, knowledge base, skilled labor, market conditions, stock market, alternate currencies, trades, instruments (monetary, non-monetary) laws, ease of doing business etc to analyse, baselines, predicts major economic issues, formation of new rules, economic policies, apathy Govts. to avoid risks, man-made disasters (fraud, money laundering, for+profit mass scale scams, hawala, black (grey market), etc allowing estimates to be developed, changes to policies etc for better governance

12) Supply chain management, especially considering the impact of climatic, economic, war, diseases et on mankind but to balance prosperity & consumption, avoiding excess storage, black marketing, enabling availibility of min. resources to all.

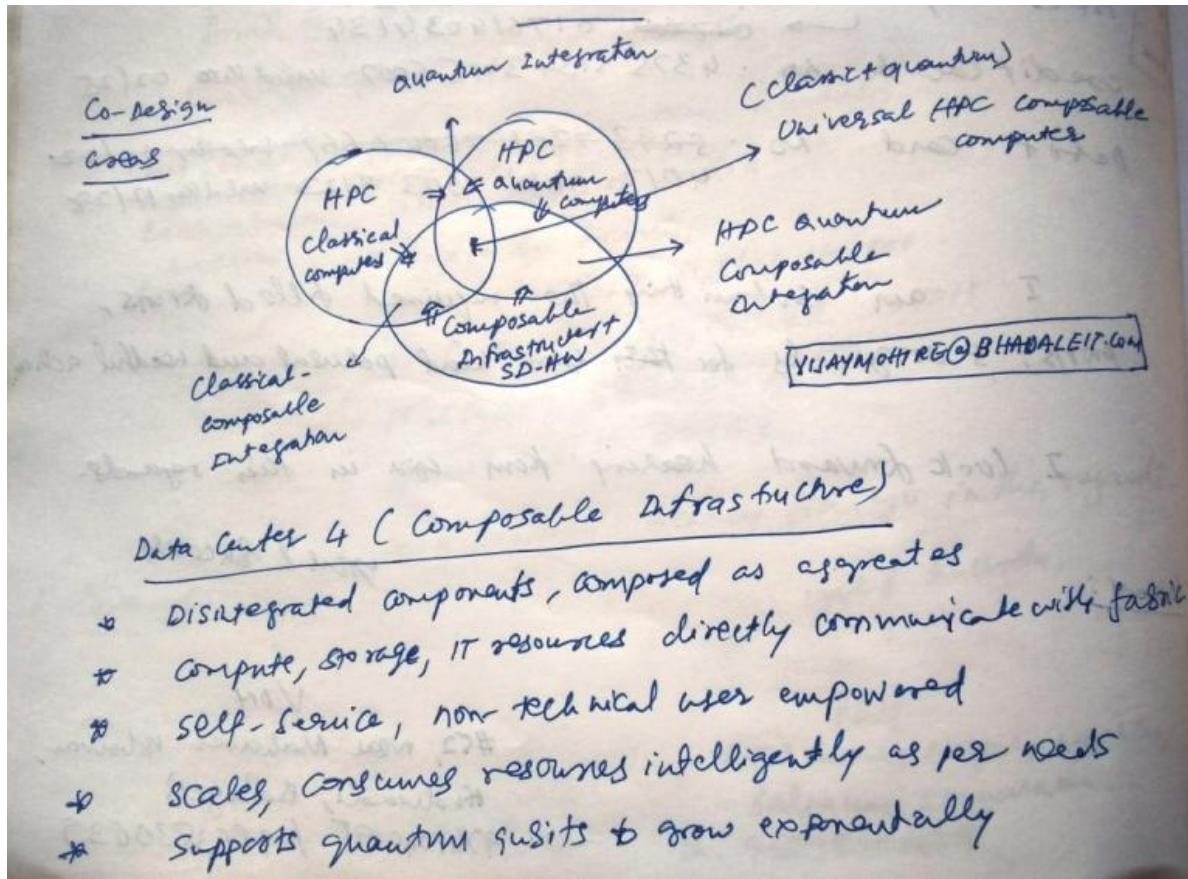Details of the above are put in the table below

Details

Image courtesy (Self), no intention for copyright infringement

We have a large set of subcategories; few are mentioned below with details tabulated

No.	Quantum area	Use Cases	Our Offerings
1	Electronic / Fermionic / Bosonic systems	• Quantum computing • Quantum sensing • Quantum communication • Solutions for hard to solve problems	We offer quantum computing models for analog and digital systems that offer NISQ and fault tolerant future systems. We offer design of software and engineering using various methods like MBSE, reengineering, re-hosting, migration of classical systems to newer quantum platforms
2	Post Quantum Cryptography / Quantum resistant systems	• PKI in quantum communication • Hardened systems against quantum hacking • Cryptography algorithms	Migration of classical cryptosystems using symmetric and asymmetric keys, newer ciphers, algorithms, newer PKI infrastructure, hardening existing asymmetric keys, and algorithms Design of newer platforms and algorithms for quantum resistant and hardened OS and IoT devices with quantum secure trusted ecosystem
3	Quantum –AI /ML based systems	• Quantum algorithms for faster AI/ML	We offer design, development and integration of quantum and AI/ML platforms, software that

		convergence • Feedback systems • Control systems engineering • Robotics • Intelligent adaptive security preventing DDoS attacks and simulated attacks	enable faster propagation and feedbacks for industrial grade systems and prevention of various attacks and threats using intelligent agents against cyber warfare, cyber crime and online thefts and fraud preventions. Tools for better defense and risk management
4	Quantum algorithms and software systems / full stack software engineering	• Newer and enhanced algorithms based on quantum and quantum inspired classical, speed up of primitives	We offer design and development of quantum algorithms that enable cloud native deployment and operations. We offer algorithms that enable HPC clusters to host quantum assets, offer bridging with various enterprise layers and frameworks for canonical models We offer quantum applications development that offer insights, monitoring and datacenter hosting in a quantum and hybrid environment
5	Quantum for Hi-Tech / Engineering / Telecom / Space / Quantum Systems Engineering	• Hi-tech manufacturing, aviation, electronics and space technologies, research, telecom and military grade system	We offer design, development and integration of quantum systems that enable solutions that offer speedier resolution to cross-engineering, cross-discipline issues, optimizations using various quantum models and ansatz, and hybrid designs templates and quantum circuits that offer routing, control and feedbacks to various industrial needs, standardization
6	Quantum Industry 4.0 / Quantum Sensors	• Industrial robotics • Industrial Control Engineering • Industrial Manufacturing • Industrial Data Management • Industrial Communications (PAN, LAN, MAN) • Industrial safety • Big Data Management	We offer various services to industries that enable better adoption, management and handling of wide range of disaggregated services using newer paradigms and designs like hyper-converged infra, composable infrastructure, Edge Computing, Intelligent Networks, Telemetry, robotics, optimization for various types of workloads and computation, reducing time and cost to market or deliver a supply chain
7	Quantum for Research	• HPC Clusters • High volume rack servers, data centers • Supercomputer + quantum for research • Research tools and starter kits for	We offer researchers, team and various staff with a range of tools, kits and codebase that are plug-n-play to popular cloud technologies. We offer design of supercomputers using SIMD, MIMD, staged pipelines, FLOPS, high throughput designs, converged quantum + classical rack designs, partner solutions

		accelerated research	
8	Quantum Chemistry	• Accelerated genome sequencing • Accelerated drug discovery • Personalized drug prescriptions • Accelerated Lab projects • Newer anti-dotes and treatment for newer diseases • Nanotechnology, synthetic biology and 3D based material design • Biological computers	We offer services that enable quantum based acceleration of various chemical interactions, bonds, byproducts and end results that help clients in developing better and personalized chemicals for various industrial , medical and pharmaceutical purposes We offer various tools, starter kits and technology transfer to non-technical staff like agriculturists, farmers and fertilizer sellers in marketing right chemical like the tool-chain for nitrogen fixation, faster and more resistant crops etc
9	Quantum BFSI	• Safer Banking • Real time fraud and theft detection • Better security using quantum-resistant algorithms • Faster back office processing for pensions, interest payments and dividend payouts • More automation and personal assistance to staff • Secure communications between branch office and other network topologies	We offer various tools, kits and content for BFSI sector that enables clients in preparing for the cyber-threats and quantum hacking scenarios. We offer better data safety that is at rest, in transit and in process. All time visibility tracking and real time control possible with quantum operations that ensures the ACID sessions are completed in time and with integrity. We offer automation for wide and large data and information processing using newer quantum algorithms and optimization techniques, risk management and back office operations.
10	Quantum for environment systems	• Carbon emission control, capture and reused • Nitrogen fixation freeing the mandatory dependencies • Industrial filters using quantum and nanotechnology • Cleansing of sea, lake waters for pollutants and hazardous substances using AI and quantum computing • Climate and environmental data management	We offer services that help environmentalist and nature lovers with range of tools, kits that allow them to offer services to end clients for saving nature, cleaning nature and systematic recycling of non-degradable material using various newer chemical combinations derived from quantum computing research We offer non-technical staff like farmers and agriculturist to use tools that help them save their expenses by personalized recommendation based on their asset , farm conditions, economics and market outreach

11	Quantum Biology, Life sciences / health care	• Research on anatomy related diseases, early warning for structural damages in various forms like slices, and data annotations to various assets like X-rays, CT Scans, Tomography and scanning • Quantum research for newer types of assets like synthetic biology entities, artificial living cells , 3D printed cells etc • Newer life science methods based on quantum computing	We offer services that help biologists and scientist in developing newer elements, synthetic biology, tissues and materials that are rare to get. Quantum computing to analyze the details of natural biological systems, body organs, hormones, Bio-chemistry and various complex interaction of the organs with the external agents and body defenses We offer quantum based discovery tools to find newer elements, and reusable parts using 3D printing, artificial food like artificial meat and various parts that are not available like live kidney or heart.
12	Quantum Big Data	• Faster and more accurate processing of big data • More secure channels of data transfer • Reduced risks due to use of quantum hybrid systems • Compliance	We offer various tools from the classical and quantum paradigms for information data processing, allowing lesser noise, errors and tamper-proof using quantum algorithms. We offer POC that help quick adoption of the technology. We offer integrated services for Hadoop, Yarn, Flume, Memcached, Datasets, AI/ML datasets , Ansatz, and Hybrid systems for processing, analyzing, storage and forwarding of data
13	Quantum Pharmaceuticals	• Newer chemicals , drugs discovery • Newer methods of treatments / drug delivery • Newer methods of personalization • Newer medicines for unknown / terminal diseases • Synthetic chemicals	Our services offers newer ways to define pharmacy based treatments, newer ways of drug delivery, and mechanism for effective treatments with highly effective drugs. We offer innovative ways to mix classical, nano and quantum systems in designing newer ways of pharmacy industrial processing
14	Quantum Governance	• Effective ways to remove corruption, fraud, deliberate faking of resources and allocation. • Assisting true Government authorities with real facts , fabricated truths by other members • Corruption control,	We offer advisory services and tools to real officials who are here to help solve the social issues. We offer them with various strategies, tools, templates that allow them to monitor, track and mitigate corruption, frauds, and greed related complications of wrong hires, salary, hikes and transfer, wrong or purposefully misconfigured, false information fed systems and policies that appear true like the false positives.

		fabrication and suppressing false information and projects by the greedy politicians • Social security issues, global basic income, environmental issues	
15	Quantum SCM	• Optimized supply chains mainly for perishable and non stock able assets • Lesser wastage of every assets in a unit, block or county • Local supplies against global transport • Remote replication of goods whenever and wherever	We offer newer algorithms that resolve various classical and NP hard problems like traveling salesman, time binning, optimized chains, tamper proof using block chains, AI and hybrid quantum systems. We offer high visibility and real time insights of the global asset through unique quantum tracking, atomic clocks and offer real time alerts, suggestions to mitigate risks. We analyze millions of assets, supply channels, vendors and offer clients with the shortlists as per their need like price, brand, compliances, licensed etc
16	Classical HPC	• Improvised HPC for classical real world problems • Quantum Simulation • Speedier , larger workload management • Big data, real time analysis, offline analysis of historical data	Our services are based on quantum inspired classical data processing and offers newer types of algorithms and problem solving capabilities that ensures client get better productivity using the same classical systems with our overlays. Our offerings are customizable, easily configurable and have standard interfaces to integrate with legacy systems be it a client-server, mainframe or a headless server, or master-slave nodes. We offer reengineering, remodeling and re-hosting solutions leveraging the cloud advantage and newer technologies like post quantum cryptography
17	Quantum HPC	• Newer faster algorithms that can solve 1000 year classical problems • Newer discoveries and simulation • Hybrid workload management • Large big data datasets processing • Petaflops of capacity • Zeta byte of data processing	Our services offer quantum advantage using latest analog and digital technologies using various principles from the quantum physics, mechanics, and engineering disciplines. We offer cloud solutions and offerings that integrate with enterprise datacenters, cloud servers in an IaaS, PaaS and SaaS models. We also offer reengineering of legacy system to migrate to quantum platform that will allow HPC systems to host quantum modules as accelerators.

18	Integrated classical quantum HPC	• Hybrid and converged HPC systems • Industry grade and room temperature operational gadget interfaces • Mobile versions of app, gadgets that allow user to run HPC workloads from any secured location • Faster processing of pending work logs, movements and cases • Improved economy due to resolution in real time	We offer hybrid solutions taking the best of both worlds. Our solutions use latest standards from IEEE, ISO, NIST enabling easier and standardized environment that will be able to scale without any performance degradation. We offer enterprise scale client-server and dedicated hosting platforms both at cloud datacenters and at your enterprise datacenter and collocation centers for a last-mile support. With distributed HPC we plan to offer cloud and hi-computing access to remote branch users and staff enabling a true first class cloud citizen experience.
19	Universal quantum HPC	• Single computer to help solve multi-domain and multi-engineering problems • Empowered user who can leverage the power using gadgets and mobiles • Real time assistance, guidance and risk mitigation	We offer true design and development services for the long term goals like the universal quantum computer that can scale well beyond 1 million qubits with minimum errors that allow computation of quantum algorithms like Shor's and Grover's search algorithm We offer services using the latest techniques like the Non-Abelian Anyons that don't need error correction, Hyper converged cryo electronics systems operating at near room temperatures with full control with minimum control errors. We offer designs for systems that scale well from the NISQ era computer to the FTQC era using various cross-technologies and principles like the Atomic, Molecular and Optical Physics (AMO), photon based propagation, accurate entanglements and gates with low switching time and latency.
20	Co-Designed HPC with cloud datacenter	• Optimized hyper converged, virtualized , containerized cloud systems • Cloud-native applications • Empowered user with HPC availability in their mobiles	We offer datacenter optimization solutions with various calculators, tools and estimation charts to show the real value and savings offered after the optimization. We offer various touch points that allow consolidation, refactoring and reengineering of various entities into various zones for security, compute, networks, etc allowing you to focus and shortlist / troubleshoot various datacenter issues.

21	Quantum for Datacenter Engineering	• Migration of legacy to quantum datacenter systems • Quantum as a Service • Quantum for Computing • Hosting and Standalone models • Standalone systems to Hosted or cloud native environments	We offer datacenter related services for quantum software and systems engineering. We offer migration of in-house, localized quantum + classical workloads to quantum datacenters with Composability design and hyper converged server racks for hi-speed interconnects We offer various starter toolkits, accelerators, estimation tools that will allow easier migration or reengineering experience
22	Quantum Cloud Engineering	• Migration of standalone and in house quantum systems to cloud platform • Integration with cloud models like QIaaS, QPaaS, QSaaS, Containerized quantum apps • Integration with quantum networks, QLAN, QRAM, QCU, QPU etc	We offer services for various cloud models that will enable clients to expose their in-house capabilities in a cloud environment We offer various models, methods and reengineering channels to transform the in-house, standalone quantum systems to the cloud advantages
23	Custom use case engineering	• Domain specific quantum or hybrid workloads • Domain specific quantum standards	We offer various services related to unique client needs that enable clients in making best use of the quantum paradigm to their niche market segments and horizontal vertical business requirements We offer wide range of IT and Engineering services in areas of design and development of industrial grade solutions for 50+ domains

Disclaimer: All rights are owned by respective owners. We have no intention to infringe copyrights or brand names. All details, references are for educational purposes only; we claim no responsibility for any loss (financial, partnership, dignity) by using our content or services. Please approach respective owners in case of any doubts

For more details, contact below:

Contact

Bhadale IT Pvt. Ltd
Program Manager: Vijayananda Mohire, Email: vijaymohire@gmail.com