Bhadale's QAI Hub ver 1.1

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This document offers a high level overview of our QAI Hub that offers various modules allowing for clients to onboard faster and get the benefits of a large set of vendor products, tools, IDE related to AI, Quantum and Generative AI technologies.

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Bhadale's QAI HUB

Executive summary: Considering the need and demand for high quality digital platforms that can help clients' to get the best of the newer technologies, we have proposed an QAI Hub that allows for rapid on boarding of clients to various modules on a need basis, allowing them to subscribe to modules they need only. We have various modules and the key ones are described in following sections.

Bhadale QAI Hub is based on these 5 key pillars.

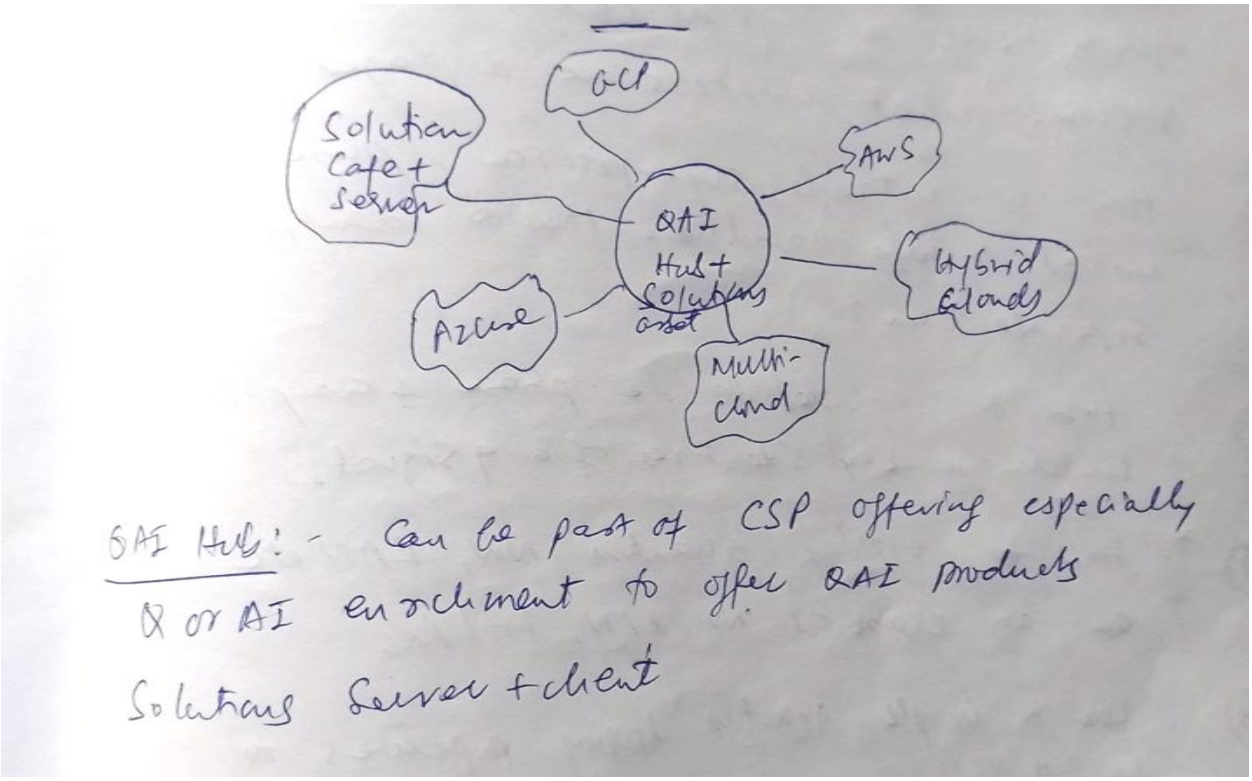
Hub Core: This is the bare minimum set of tools, libraries and software needed to leverage our various platform offerings. The core can be deployed remotely, onsite, to mobiles or even an IoT.

Multi Cloud Engg : Offers IDE, tools for integration of various cloud vendor solutions for IaaS, PaaS, SaaS Models, related client requirements, domain requirements, project needs etc to the available vendor solutions using our best practices, inventory , assets and our expertise in middleware design. Designs like Mesh architecture, Service Bus, OSI layers, logical design tools, workflow design, various security features, off loaders, centralized or distributed admin etc that many clients need to administer

Multi Quantum Tech: For cross-technology and classical and hybrid modes of operations, we have the hub equipped with best practices from various vendors, tools and backend. Integration with multi-cloud Engg as explained above is possible allowing for faster on boarding of clients. Supported technologies include superconductors, semiconductors, trapped ions, topological qubits, and photons to name a few. We offer direct solutions that allow for clients making best use of the various features from various vendors.

Multi AI Tech: For cross-AI, ML technologies, platforms. This is integrated with the Multi Cloud Engg module, allowing for easier and portable movement of virtual assets across different vendors, using open source and open standards.

Multi Cloud and Multi Quantum: This allows for special clients and guests to take their innovations to greater heights by having a fully integrated set of multiple clouds, multiple AI, multi quantum tech to be available and an optional HPC center can be made available at a dedicated collocation.



Details

There are various features and finer details that are part of this hub. Below are few noteworthy ones making this hub a unique opportunity to explore.

Harness the power of emerging technologies

Clients get first hands-on experience of the emerging technologies under the same umbrella. Few of these are quantum, artificial intelligence, machine learning, client-server architecture, hi performance architecture, cloud design patterns, cloud scalability, post quantum cryptography, toy models and solutions for more than 50 industrial solutions with more than 100 use cases under each domain.

Aligned to various national initiatives

Our solutions are designs to meet various international initiatives in quantum and artificial intelligence.

Integrated solutions

By having an integrated and pre loaded apps platform we offer more productivity, with lesser integration issues or downtime, and lesser time to market etc for client projects. Easier tools for integration, disintegration, aggregation, disaggregation, from scratch using first class cloud primitives across platforms. Above

mentioned 5 pillars or key segments are all interconnected with minimal disruption, noise and high speed data transfers.

Scalability

Our hub offers scalability across popular multiple clouds, and hybrid cloud architectures. Initially centralized managed hub, can be scaled as ecosystem and hub nodes increase

Seamless migration

Migrate from one platform to another seamlessly, allowing for smooth transitions from one platform to another with no specific vendor lock. We offer cross-platform, cross-cloud, cross vendor integration along with partners and third party tools that can help in brining the siloed islands together

Phased hub releases

Hub will initially work in a single centrally managed hub mode; after that a newer QAI Internet arch (or adoption and tailoring of the Industry Quantum Internet) design will lead to distributed managed hub. QAI is intelligent internet using QAI, Block chain and various emerging technologies like PQC, niche vertical, horizontal market segment solutions etc

Agile and open standards

We leverage upon open standards and agile methods that allows for absorbing updates, issue management, design changes etc upto the last release.

Hub development lifecycle

QAI hub lifecycle management, product development, release management, QAI SDLC, SysDLC, SW Engg., etc will allow help in making quality hub.

Standardized Hub

The hub will leverage upon industrial alliances based data sets, middleware, open standards, industrial standards, grades and features like IEEE, NIST, ANSI, ISO etc that allow for easier personalization to individual projects. We also use FPGA like configurator that will allow clients to self configure or use automation wizards to configure the assets and network to meet the project needs.

Personalization

Clients, domains and users can use the core model and build their own unique solution using given universal configuration using FPGA, IaaC, their in-house reusable assets etc. We offer placeholders and dynamic plug and plug client layers for custom apps, and custom solutions, third party tools to be integrated in this hub

Research oriented
We offer this hub along with various toy models (AI, quantum and emerging technologies) that offer ways to research, conduct trials and experiments to users. We suggest various types of open source for cross language, cross platform integration, tools and standards that assist your research team to develop projects that allow experimenting hypothesis with a large pool of tools in hand.

Hub architecture

The QAI Hub needs to be flexible, accommodative and have lots of placeholders to accommodate various future generations of technologies like quantum internet, block chains, quantum cryptography, thick and thin clients, various newer cloud features and products etc. So we plan to use aggregation and layered modules that fit into the hub model and those that can be added and removed easily for various use cases. Below are few points:

1. QAI hub uses classical and quantum AI, ML and app switching sw maybe a real-time Hub OS, use Google's BigTable, Spanner and NoSql DB to handle worldwide requests or regional CDN, Datacenter that have synch at server and client layers.

2. Based on client subscription, various types of elements are aggregated and mini command control center used to automatically setup. This may later on be made a newer cloud type with highly decomposed aggregated services.

3. This QAI cloud hub hosts all types of human consumables for all types of businesses that need IT and domain specific services.

4. Add domain layer that gets based image, add common services layer, classical and quantum modules, or programs, processing pipeline etc.

5. Hub will have layered, aggregated object maps that point to various IT, domain and all assets hosted in hub.

6. Sub modules, special layers added based on program, project and individual levels. So highly personalized offers possible.

7. Most of these done via Admin pages submissions for auto configuration and go live for each subscription.

8. Leverage existing cloud features, aggregation of multiple vendors, multiple platforms, multi technologies, placeholders for newer product or services, auto configuration based on custom or standard configuration request.

9. We might bring CloudOS, QAI Cloud OS, and various flavors that are compatible and can be deployed for various purposes, industries and user needs

10. With this Quantum Internet can also be extended as Quantum AI Cloud Internet with focus on cloud platforms. Thin clients, apps, light protocols with inherent quantum security will allow for newer internet types and special ones like military cloud etc

Project phases:

The broad phases are planning, experimentation, design, development, testing and production.

First phase will be design and evaluation of single cell that will host subnets for various cloud platforms, cross links, hybrid connection like in a Fpga that can be rearranged as per configuration using IaaC.

First phase will evaluate the individual quantum, AI, and hub capabilities and rework design for approval in an agile manner.

Once these are approved , they are integrated using our proprietary design and patents that will allow for better scalability, security etc

Integrated tests will focus on overall performance, capabilities, cross cloud functions, sample reusable solution assets that can work for a single domain or industry. Along these common functions, assets for 50 industries are identified and how our QAI Internet nw is designed.

Once these are partially developed, QAI internet phase is kicked in. The QAI internet will focus on scaling various clouds, middleware, proxies PQC algorithms, distributed QC AI computing etc

Once done these are integrated along with sample industrial solutions for production

Production grade racks, servers, QAI OS, tested QAI nw, solutions are deployed to sample rack units to test their production and operations efficiency. These are graded and various designs for uses cases are used to test the quality of apps , nw etc.

Various engineering tests, speed tests, QAI performance vs. classical servers are benchmarked for quantum advantage

These are then put as SLA, OLA limits and sold to clients with assured improvements along with solutions. Costs are recovered by billing clients and getting subsidies, discounts, grants etc.

The production servers can be miniaturized based on nano technology and 3d printing etc

Suitable form factors can be used for offers.

Standardization and design patterns developed at various project phases and cycles are documented, technical written, translated local needs, design of various standards published, patents filed, installation manuals, troubleshooting of various issues, responses are developed documented and published

All these happen during last phase. During client deployments, we offer personalization and customer domain and project adoption to newer products, related change mgmt, etc are used.

Post deployment various concerns, issues are taken up on priority and if required, design changes or newer product releases are developed.

Post project completion, maintenance staff, sales are deployed with reach out to code team that can be on call for any technical issues or product redesign

Newer products, newer client deployments will become a common thing for at least 10 years before taking on newer technologies staff and newer generation leaders

What type of post delivery support offered. What are typical operational costs, TCO, SLA related warranties, legal options etc.

Maintenance staff, fees etc, turnkey solutions.

Planning phase

Plan to operate this hub for at least next 10 years without much issues and applicable upgrades etc

Experimentation phase

This phase needs efforts and research to prove hypothesis and use cases. Typically done in a lab setup and with a team of developers and, testers

Design phase

Once the experimentation results are ready then these are then elaborated in the design phase with various architectures, design patterns, code samples and various use case mapping that allows for testing the scalability of the model

Development phase

This is the actual implementation of the design phase entities like code samples, models, automation, layer development, unit test etc. These efforts result in the development of the various modules, code elaboration, first level code testing etc

Testing phase

This involves integration testing of the various modules to see for quality and quantitative metrics that can go wrong and deviate from expectations. This is reassess the metrics and offer a redo of the development to meet the needs.

Production phase

Here the various project modules are configured as per sample client needs and automation and various DB, services and OS level settings are set allowing for easier and remote deployment. This phase will involve clients either at their premise or at our Solution Café centers

Post –Delivery, Operations phase

This involves training, operations and monitoring of the systems and quality of the deployed project. Any issues, flaws and security incident are monitored, logged and various mediations or governance rules are introduced to disallow breaches and external threats

Technology landscape:

Public and private Cloud entities like compute, storage, network elements, GenAI, block chain, PQC, etc all will be used as required. Various types of parallelism and virtualization are used.

Financial Costing:

Cost recovery can happen once go live to production with good UX, copyrights, content permission, research approvals, patent filing etc

TCO can be considered, however lots of many expenses can be one time or operational ongoing ones. Various phases have various types of resource requirements. So proper planning

Generating revenue and profits:

How can you fit the expenses of .8 million for this project creating 10 perm US jobs in 2 years. 80k*10 staff =800k, min investment.

So this will be lab work or junior staff only. How to do this profitable. Will you put this in production? You will need 10 highly paid staff, say 140k*5=700k million+80k*5=400k=1.1 million paid annually to operate, apart from other fixed expenses. Operation of 10 member staff office takes another 10k per month, 120k per annum. So 1.2 million is min. Operations costs per annum. Plus taxes say 10 percent of profits, no profits, no taxes, other taxes do, 100k, 1.3 million operations cost. No profits until sales commence.

So needs proper planning to generate revenue, or use grants to operate further.

Who will buy, MNC Cloud players, Govt agencies, homeland focus better as some assurance available.

So, target clients can be Govt. home land security, border security, space, sea security, threat detection and predictions, cyber security, CPS security, .So choose projects that you sell to Govt and at what price, can it be takeover, grants etc.

Staffing :

Onshore, as this needs 10 permanent staff skilled and semiskilled to be working on this for various phases.

You have expertise, funding and planning for revenue generation needed.
How would you apply under the National interest waiver. How do your projects qualify under AI, Quantum and Defense projects.

If given PR what security clearance required.

Note: You can find further details in the enclosing folder and file like design recommended by ChatGPT and others.