

KadMap Development Project

The end-to-end nature of KadMap[®] was a huge challenge. KSL devised a strategy to surmount this challenge using a project based approach. They created an integrated project dubbed "KadMap[®] Development Project". The goal of this project was to surmount the challenges inherent in the end-to-end nature of KadMap[®]. Each subsequent project deliverable was identified and configured as a milestone towards addressing the challenges.

The KadMap[®] Development Project has been completed and there are several deliverables in form of digital solutions and updates that have been achieved.

Each deliverable in this project was realized by following stipulated stages of activities from research to testing, verification, QAQC, industry engagements, etc. among others in a systematic and efficient manner tailored for the Energy and Engineering (EE) industry.

The deliverables were well incubated in order to attain seamless integration, interface and compatibility between all developed solutions.

There were nine stages in total required for the incubation and development of a KadMap[®] deliverable from inception to industry.

The nine stages are:

- (1) Technology gap research
- (2) Technology R&D including validation/verification of findings
- (3) Early market research
- (4) Solution integration/packaging into distinct product for industry deployment
- (5A) Early industry consultation
- (5B) Product specification update
- (6) Demonstration version production
- (7A) Industry consultation
- (7B) Product specification update
- (8A) Industry engagement
- (8B) Commercial product update

(8C) Product testing

(9) Aftersales and continuous product updates

Stages 1-4 are incubation stages, stages 5-7 are intermediate development stages, and stages 8-9 are full scale production and deployment stages.

The image below (Fig. 1) illustrates the deliverable development process of the Project:

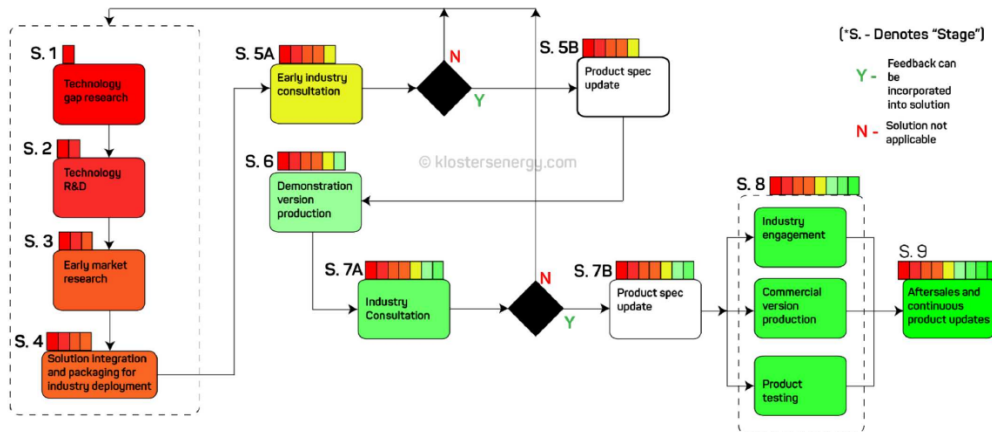


Fig. 1 KadMap® Deliverable Development Process

Phase	Objective	Timeline	Deliverable
1	Develop robust data framework capable of abstracting the assets and operations of EE enterprises	2007 - 2015	<ul style="list-style-type: none"> • KadMap • Framework, • Others
2	Development and packaging of digital solutions for EE industry	2014 - 2018	<ul style="list-style-type: none"> • KadMap Web • Interface, • Others
3	Deployment of solution to EE Industry	2018 - 2023	<ul style="list-style-type: none"> • KadMap OS, KNS, • Others (including KadMap Apps)

Phases of KadMap® Development along with objectives, timelines and deliverables

The deliverables achieved in Phase 3 are illustrated in the image (Fig. 2) below:

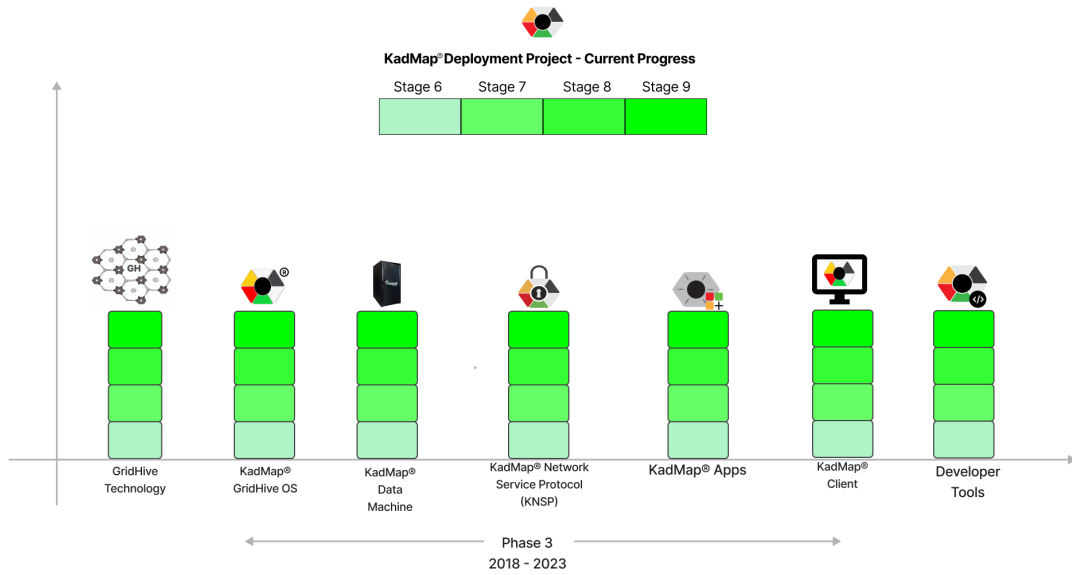


Fig. 2 KadMap® Deployment Project Current Progress

We have completed Phase 3 which involved the implementation of KadMap® in real-world settings. It required careful planning and coordination to ensure that the solutions were deployed smoothly and efficiently, and that any issues or challenges that may have arisen were addressed in a timely manner. The successful completion of this phase was a major milestone for the KadMap® Development Project and paves the way for future growth and development.



Fig. 3 Phase 3 Deliverables

Deployment Milestone Summary

The KadMap® Development Project is currently at 100,000 manhours and has achieved several key milestones in its development, they include:

1. GridHive Technology
2. KadMap® GridHive OS
3. KadMap® Data Machine (KDM)
4. KadMap® Network Service Protocol (KNSP)
5. KadMap® Apps
6. KadMap® Client
7. Developer Tools

Below are the summary of the milestones:

1. GridHive Technology



GridHive (GH) is an advanced information system that revolutionizes the way organizations collaborate and perform computing tasks. With its unique architecture consisting of loosely-coupled nodes, GH enables highly scalable and fault-tolerant distributed computing. In this decentralized environment, each node is owned and controlled by a separate organization or entity, fostering collaboration and resource sharing among participants.

Unlike traditional computing systems, GH is specifically designed to facilitate distributed and decentralized computing. Its primary objective is to enable efficient collaboration and resource utilization rather than solely focusing on complex tasks and calculations. This makes GH a flexible and adaptable system suitable for a wide range of applications.

The GH architecture fosters collaboration by providing a platform for exchanging data and performing tasks across the network. Organizations can securely share and access resources, enabling efficient cooperation and leveraging the expertise and capabilities of multiple entities.

At the heart of the GH system is the GridHive node. This node serves as the host for the GH infrastructure, orchestrating the network and facilitating collaboration among the participating organizations. The GH node operates on dedicated physical hardware, ensuring optimal performance and reliability.

2. KadMap[®] GridHive OS



KadMap[®] is a secure private data transaction system. It provides private and secure data and networking services to enterprise clusters. KadMap[®] GH now inherits the GridHive technology capabilities performing distributed and decentralized computing.

KadMap[®] GridHive OS serves as the middleware for the KadMap[®] GridHive, facilitating secure and collaborative distributed computing. It provides robust privacy and security features, and enables peer-to-peer (P2P) access to nodes within the KadMap[®] GH. As the operating system for the KadMap[®] GH, it coordinates distributed computing tasks and streamlines communication between interconnected devices.

KadMap[®] GridHive OS is an essential deliverable of the KadMap[®] Development Project, playing a crucial role in maintaining the smooth and efficient operation of nodes on the KadMap[®] GH.

3. KadMap® Data Machine (KDM)



The KadMap® Data Machine (KDM) is another critical deliverable of the KadMap® Development Project, serving as the node and hardware foundation of the KadMap® GridHive. The recent achievements include the categorization of the machine into two distinct types - industrial and enterprise. This distinction provides a clear division between the machines that are designed for heavy-duty tasks and high-performance computing, and those that are designed for lighter operations. This accomplishment demonstrates KadMap®'s commitment to providing tailored solutions that meet the diverse needs of their users.

The industrial series of KDM is designed to handle the most demanding tasks, with high computing power, large amounts of storage, and large RAM units. This makes it ideal for industries which require high levels of computing power and data storage to run complex simulations and process large amounts of data.

On the other hand, the enterprise series is designed for lighter operations. The enterprise series still provides ample computing power and storage to meet the needs of enterprises, and its affordability makes it accessible to a wider range of users and organizations.

4. KadMap® Network Service Protocol (KNSP)



The KadMap® Network Service Protocol (KNSP) is also another critical deliverable of the KadMap® Development Project that defines the rules and procedures for communication and data transfer on the KadMap® GH making it more secure, efficient, and reliable.

The KNSP is designed for establishing encrypted connections, ensuring the confidentiality and integrity of transmitted data between nodes. It keep data in the KadMap® GH secure and private.

5. KadMap® Apps



KadMap® applications are decentralized applications, also known as DApps. DApps are software applications that run on a decentralized network, such as a blockchain or a peer-to-peer network. Unlike traditional applications, DApps do not rely on a central server or authority, and they typically use smart contracts to execute their code on the network.

The KadMap® Data Machine (KDM) is responsible for transmitting, receiving, and hosting KadMap®-compatible data and applications and the KadMap® Network Service (KNS) provides

the networking component that enables the transfer of resources within the KadMap[®] GridHive using the KadMap[®] Network Service Protocol (KNSP).

KadMap[®] applications can provide a wide range of services and functions, such as financial transactions, data storage, and communication. They can be used for various purposes, such as gaming, social media, and e-commerce.

6. KadMap[®] Client (K-Client)



The KadMap[®] Client (K-Client) is the software with which users interact with the KadMap[®] infrastructure. Its primary interface has undergone numerous improvements and updates over time, resulting in several significant milestones. As a result, the K-Client has become a more efficient, reliable, and secure way to communicate with the infrastructure, providing users with an enhanced experience.

7. Developer Tools



Developer Tools are essential deliverables of the KadMap[®] Development Project, designed to aid developers in the creation and development of KadMap[®] applications. There has been a recent accomplishment of a series of significant milestones, which have significantly streamlined the application development process and improved the overall user experience of the applications built on the project.

One important milestone that the developer tools team has achieved is making the simulator production-ready. This means that the simulator is now fully functional and can be used by developers in a live environment, making the development process even more streamlined and efficient. The production-ready simulator also provides developers with the confidence to launch their applications, knowing that they have been thoroughly tested and optimized for the end-user experience.

The developer tools also include a number of other features and tools, such as robust debugging tools, real-time analytics and reporting, and a comprehensive API reference, that help developers to create high-quality applications that are optimized for the end-user experience. These tools are designed to be user-friendly, accessible and intuitive, making it easy for developers of all skill levels to use them effectively.

8. KadMap[®] Team

1. Dr. Echezona Chukwuka (PhD) - CEO
2. Chukwunyelu Chukwuka (MSc, MPhil) - COO
3. Prof. Thaddeus Chidiebere Nwaoha - Lead Risk Analysis, Product Research
4. Prince Omonu Itanyi - CTO
5. Abdulmutalib Jamiu - Manager, KadMap Applications
6. Monday Yusuf - Manager, Administrative Operations
7. Sunday Itanyi - Manager, Brand and Product Concept Development