Structure and Value of the New Service Platform "Workplace Hub"

Tomoo SUZUKI＊, Ryoya KAMATA＊

THE FUTURE OF WORK:
WELCOME TO WORKPLACE HUB

Abstract

Konica Minolta has set a goal as 'One Konica Minolta' in its current mid-term business plan SHINKA 2019, committing to evolve itself to 'A Digital Company with Insight into Implicit Challenges' which contributes to society by identifying customers' potential issues and achieving the solutions, and is pursuing the goal on a company-wide basis. It launched Workplace Hub in October 2018, a versatile IoT service platform to realize the evolution. It is composed of a hybrid IT system that provides a core IT infrastructure such as a network and storage in the customer's environment on top of which Konica Minolta's unique IT services are available, offering required solutions, remote maintenance, and backup service. Through this service platform, Konica Minolta establishes a mutual-beneficial ecosystem for Konica Minolta, its application suppliers, and its customers, developing and providing highly appealing services for the customers to solve their issues directly in addition to it by connecting existing or new applications, services, and input-output devices as well as combining its cutting-edge technologies including data analyses, robotics, and deep leaning.

Konica Minolta will accumulate knowledges to identify customers' challenges via the services it offers and embody its technologies and ability to solve the challenges gained in its various businesses as One Konica Minolta to utilize it for Konica Minolta's service delivery capability making the most of the accumulated big data.

＊ Productization Division, Digital Workplace Business Unit

1 Introduction

Cloud services and digital devices with cutting-edge ICT technologies are increasingly permeating into various fields such as traditional industries, economic facilities, educational institutions, and public sectors, resulting in remarkable changes in people's lives and businesses because of reduced human labor, computerized systems, and information available real-time. It has realized new values and profits to humans while a lot of remaining challenges to be countered and societal issues will be surface in the near future during the shift. Konica Minolta, having proclaimed 'One Konica Minolta' in its mid-term plan 'SHINKA 2019', commits itself to transform to be a 'Digital Company with Insight into Implicit Challenges' contributing to society across the board by identifying customers' underlying issues and working with them to find the solutions. Its newly-launched Workplace Hub is a platform to not only solve customers' issues but contribute to their work style reform and the growth of their businesses by offering scalable hybrid ICT services. The present document is intended to introduce the Workplace Hub.

Workplace Hub is a platform to offer new solutions integrating a high-end server, IT infrastructure, and Konica Minolta's unique IT services. The customer will receive only the main body of Workplace Hub, which is further supported by a separate backend system and its services are activated for the customer when the two systems are connected via the Internet. (Fig. 1)
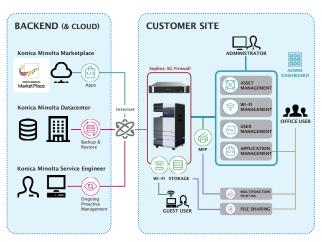

Fig. 1 Overall system of Workplace Hub.

A Workplace Hub consists of three components:

• Hybrid IT system

Interconnecting the Edge IoT device located in customers' workplaces and cloud data centers, the system offers a differentiated value delivered by its all-cloud services including real-time data processing, secured privacy and security, and reduction in on-cloud data/communication volumes.

• Remote management system

Konica Minolta's remote service centers monitor customers' work environment 24/365 while providing remote maintenance to eliminate operational downtime.

• Services platform

Konica Minolta MarketPlace provides not only its own apps but a variety of third-party ones. It enables customers to design and build solutions to meet their requirements, solving their essential issues, improving productivity, and achieving solutions with high-quality added value at low cost leading to the work-style reform.

The following sections will demonstrate how Konica Minolta has achieved these values taking two means of approaching the subject, through system architecture and Konica Minolta's value proposition for customers.

2 System architecture of Workplace Hub

2.1 Hardware architecture of the Workplace Hub

The Workplace Hub's computer part is a server for enterprises. It came into fruition through collaborative development work with Hewlett Packard Enterprise (HPE). The Workplace hub lineup available as of 2018 features two models: the multi-functional peripheral (MFP) model in which the server and Konica Minolta's MFP is incorporated and the Edge model, a single-body server. (Fig. 2).
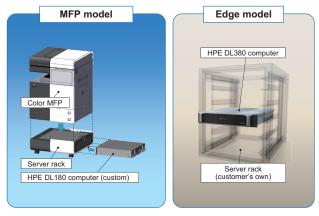

Fig. 2 Workplace Hub hardware configuration.

The internal computer's architecture has employed HPE's time-proven technologies. The MFP model's server is customized with shortened width/depth

and extended height to be fit in the MFP's main body, and its cooling unit to be quieter with office environment in mind. Meanwhile, no customization has been made to the Edge model because it is supposed to be located on a general-purpose rack. While the servers in the MFP and the Edge models are different in terms of the hardware, their functions as a service platform are technically identical.

Some standardized packs with CPUs, memories, and storages are designed to be loaded to either of the models with customers' business scale and use cases which vary in mind, and each customer can pick the one that meets their requirements.

For reliability purpose, the storage is hot-swappable and managed by RAID, accompanied with a redundant power unit.

The MFP model incorporates this server and Konica Minolta's SMB-oriented color MFP, both of which are linked with an Ethernet cable. Strongly connected, the upper-level MFP device and lower-level server rack feature security architecture with a PIN-protected key, and fixing brackets can be attached to its bottom to block unauthorized access and protect itself from being taken out. The server-only Edge model is expected to be installed onto the customer's existing or newly-made server rack, and the customer is liable for protecting the device from theft and unauthorized access. The MFP model is supposed to be located in the center area of office environment allowing the users direct contact, which differs from the usage of the Edge model to be placed in back-office invisible from general users apart from the administrator and accessible only via web browsers.

2. 2 Software architecture of the Workplace Hub

Fig. 3 illustrates the architecture of software installed on Workplace Hub. Running on the server, the base OS employs the Linux distribution Ubuntu, on which all the Workplace Hub programs operate. The standard services that a Workplace Hub offers run on Linux Containers (LXCs), and the server comprehends virtual Linux computers each of which associates a service function. Workplace Hub is also compatible with Kernel-based Virtual Machine (KVM) to import additional services in addition to the standard ones or the customer's on-premise IT infrastructure relying on its environment into the Workplace Hub. It enables the customer to build a virtual Windows server on a KVM and transfer the Windows environment to it when the customer has been using apps operable only on Microsoft Windows. The reason of

the adoption of Ubuntu among many Linux distributions is largely its capability to support building a virtual Windows server.

The Ubuntu has built-in Sophos XG Firewall as a unified threat management (UTM) tool. As software with highly-secure cryptographic technology, XG Firewall provides a strong firewall with an alert function against cyber-attacks while building and managing the customer's wired/wireless LAN environment and access to it. The MFP model has a built-in mobile communication terminal connected to a global roaming service to automatically open a mobile communication line in case the customer's wired Internet connection is cut off for any reason, enabling the Help Desk to remotely diagnoses the cause and recover the line.

Also installed is Acronis' backup agent, which backs up and recovers data, and ScienceLogic's remote monitoring solution is implemented onto all LXCs on Ubuntu and virtual servers on KVM.
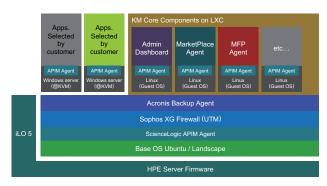

Fig. 3 Workplace Hub software architecture.

2. 3 Architect of the Workplace Hub backend system

Konica Minolta has built secure data centers in areas where Workplace Hub is sold, and each data center is equipped with a remote monitoring system and backend management system, as shown in Fig. 4.
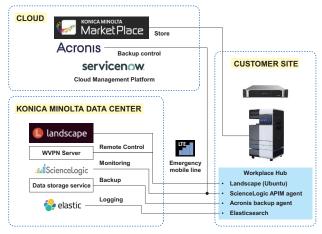

Fig. 4 Workplace Hub backend system.

The remote monitoring system powered by ScienceLogic's SL1 platform has an alert function in case of malfunction such as hang-up and other problematic signs diagnosed based on detection of changes in the CPU or memory usage, and transmits an alert to the Help Desk. It also has the uniquely developed Dashboard function with which the Help Desk can collectively monitor the status of Workplace Hubs in the sales area enabling real-time and efficient remote monitoring.

Supported by Canonical, Landscape is a solution to control Ubuntu remotely while providing services including program updates for Workplace Hubs located in customers' sites and building of virtual servers.

Each data center also has a virtual private network (VPN) server installed for VPN to communicate with each Workplace Hub and operate it remotely via Secure Shell (SSH).

Two solutions collect a Workplace Hub's error log, Elasticsearch and Kibana provided by Elastic. The log data is aggregated and analyzed focusing on the trouble occurrence tendency associated with the customer's usage to use for updating the Workplace Hub to improve its reliability while securing the customers' privacy.

Backup data is managed with Acronis' cloud services, with which the Help Desk remotely maintains the periodical backup schedules for each Workplace Hub. Its data files are stored in either Konica Minolta's secure data centers or the local network attached storage (NAS).

The components of the abovementioned backend system are built in Konica Minolta's data centers or third parties' cloud, and they are connected to ServiceNow's cloud management platform to enable the Help Desk to utilize them efficiently and collectively, as shown in Fig. 5.
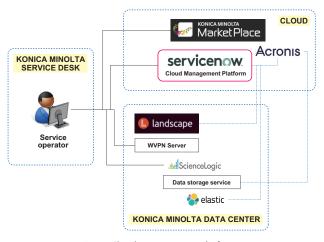

Fig. 5 Cloud management platform.

3 The value proposition Workplace Hub offers

3.1 Interrelationship between the system architecture and value proposition

This chapter will demonstrate the main IT services to offer to the customer enabled by connecting the aforementioned Workplace Hub's hardware, software, and backend system.

Fig. 6 shows the value propositions gained when a MFP-model Workplace Hub is installed as a gateway of the customer's network.
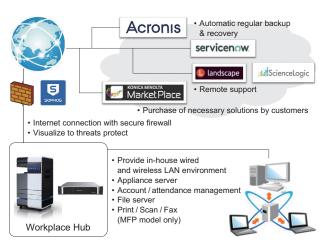

Fig. 6 Customer value of Workplace Hub.

It gives the customer a secure and firewall-protected access to the Internet enabling building of the company's internal LAN environment. It also enables the customer to give guest users differing access rights from official users. Workplace Hub has a file server function, which allows sharing of any files stored by the users among other users, while the file server is compatible with the MFP's print and scan functions. The administrator can introduce and manage this IT infrastructure securely and easily. In addition to Workplace Hub's core functions, it also makes use of the customer's office space by virtualizing appliance servers and importing it onto KVM.

The Help Desk provides remote maintenance and recovery services when the customer experienced a trouble, or on request basis. The customer can purchase solutions as required from Konica Minolta MarketPlace to install them onto the Workplace Hub. This accomplishes Konica Minolta's all-in-one IT service.

Meanwhile, there is no certainty that all the Konica Minolta customers will install Workplace Hub as the gateway to their business as stated above. It is more likely on the contrary that a Workplace Hub is introduced as one additional device to the existing network

environment. When this is the case, it is configured in the mode to run as one of the devices on the network, as illustrated in 'Client Role' in Fig. 7, to provide values not associated with the network infrastructure. Besides, the Edge model does not have any MFP function such as print or scan.
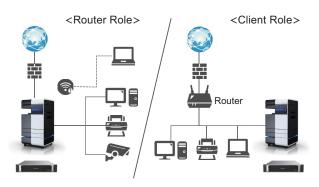

<Router Role>   <Client Role>

Router

Fig. 7 Workplace Hub network role.

3.2 Interrelationship between the business architecture and value proposition

The value proposition stated above are mainly based on the functionality of Workplace Hub's base unit and adopted technologies. In order to view the value proposition Workplace Hub offers as a whole, a business perspective is required.

Fig. 8 is a diagram of the framework through which Konica Minolta offers the value proposition with a Workplace Hub to the customer. It consists of three layers as shown in the diagram, numbered #1, #2, and #3 from the bottom.
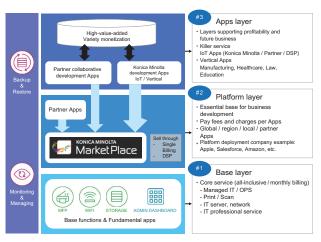

Fig. 8 Workplace Hub business structure diagram.

The abovementioned 'functionality of Workplace Hub's base unit' refers to the #1 layer. It is an architecture where services can be provided through a variety of IT infrastructures built within one system, which itself is an attractive product. But the #1 layer is positioned just as a foundation to enable the all-in-one

ICT services via the framework. The appealing point as the Workplace Hub is bolstered with the integration with the #1 and the above layers.

The #2 'platform layer' is an ecosystem to be deployed with Konica Minolta MarketPlace as its base. Konica Minolta MarketPlace is a business platform where Konica Minolta collectively sells and maintains its apps and services with value proposition offered via Konica Minolta's devices. Konica Minolta's existing MFP products in field will also be aggregated onto MarketPlace. The services obtainable at MarketPlace are developed either solely by Konica Minolta or collaboratively with third-party application suppliers. This ecosystem provides a mutually beneficial inter-relationship by enabling the supplier to own a sales network connecting to Konica Minolta's customers in the world while Konica Minolta to widen the range of its value proposition. In addition, customers also benefit from this system as they can purchase solutions they require and get charged as appropriate. Plus, the payment can be collectively made without exchanging paperwork such as estimates or bills between each service supplier while other enquiries including program updates and license period can also be made aggregated with it.

The #3 layer is the strongest appealing point in this value proportion business via Workplace Hub. Although the solutions available in the #3 layer are service products to offer the value via Konica Minolta MarketPlace in the same terms of #2, the products themselves differ from the supplier-made and existing solutions. The components of the services are apps, cloud services, and devices to input/output data (including monitoring cameras and Workplace Hub etc), which analyze the received data utilizing deep learning or robotics, and process it by pattern recognition before its output or aggregation. These components are combined as appropriate as a service pack to present the essential solution with a stronger appealing power to the customer. It cannot be one single general-purpose product which can be applied to all customers as their issues vary by customer's industry and business model. A service pack must be tailored to meet each requirement that varies by customer, consisting of compatible apps and devices, and the lineup shall be continuously strengthened.

Workplace Hub viewed from a customer's standpoint shall be a platform to provide services when all the components in #1 to #3 are incorporated, as illustrated in Fig. 9. The backend system's backup function and the infrastructure for remote servicing mentioned

in above are the essential parts not only to support the stability of the #1 base functions but to provide the customer with the product value included in the #2 and #3 layers in prompt and secured manner.
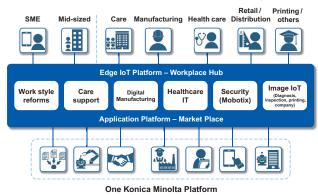

Fig. 9 Conceptual drawing of One Konica Minolta platform.

4 Conclusion and future tasks

All the above features, especially the description on the #3 layer, demonstrate Workplace Hub's identity as a platform, and a potentially feasible business development system to achieve open innovation committing with Konica Minolta's internal sectors as well as its business partners. Konica Minolta has already started selling Workplace Hub in Europe and the United States preceding other areas to further advance the scenario on its value proposition business to achieve a success. However, there are three factors for Konica Minolta to work out in the future to leverage Workplace Hub's primal power of the value proposition for buying customers to the fullest:

First factor is improving its knowledge to identify customers' issues. An issue is not necessarily always visible but the invisible root cause hiding in the back needs to be countered. Being not as a product-out, the service products that Workplace Hub offers require Konica Minolta to repetitive hypothesis verification in collaboration with buying customers to identify and solve root causes, and this experience and knowledge shall a wellspring of Konica Minolta's stronger ability to do so.

Second factor is intensifying its ability to offer value proposition based on more dynamic One Konica Minolta activities. Having produced Workplace Hub, the Business Technologies (BT) Business sector who usually deal with MFPs does not expect the product to remain as one of the BT Business products in future. Apart from its office business, Konica Minolta has already ventured into other areas including manufacturing and industrial digital printing, and other industries such as healthcare, industrial optics, and functional materials, in each of which it has a wide range of knowledge and experiences on R&D, quality assurance, sales, and market support. They are further reinforced by the employees with expertise and specialized skills on their fields, those who share challenges with a number of customers, and those with ideas and techniques to solve the challenges. Konica Minolta shall undeniably be successful in delivering highly-innovative products and services by evolving its framework to achieve better value propositions. Not only the Workplace Hub is a product but it shall boost the across-the-board activity One Konica Minolta.

Third factor is aggregating and leveraging big data. It is estimated that approximately two million companies are using Konica Minolta products for various purposes as of now. Most of the products situated in the two million companies are MFPs, which directly handle the customers' workflows and business operations. It is absolutely essential to leverage technologies such as deep learning or IoT to identify in-depth issues in those workflows and elicit proactive solutions, but even if 1,000 Workplace Hubs in total were installed and used by customers in all over the world, big data that is effective for deep learning would not be able to be collected as their own terms. While the numbers of installed units or operating years of Workplace Hub should be increased, it is important to aggregate and compute information from other products including MFPs, monitoring cameras, and customers' PCs efficiently and appropriately. Connecting with its on-premise main body and on-cloud data center elaborately, the Workplace Hub secures real-time data processing as well as maintaining privacy and security at the same time as a hybrid IT system to facilitate the customers' work style reform in the manner that best fill their needs.

When the above three factors are achieved in addition to Workplace Hub with the value proposition accomplished, Konica Minolta shall be able to provide beneficial information successfully to not only customers but application suppliers, delivering a success in growth and evolution of all the Workplace Hub stakeholders as a whole.

Workplace Hub is advancing step by step embracing the potential to realize the innovation-driven future.