

## HOW A COMPANY PRODUCING INDUSTRIAL LIFTING SAFETY HOOKS BECOMES THE KEY STRENGTH IN PROTECTING PEOPLE'S SAFETY BY ESTABLISHING A NEW BUSINESS THROUGH DIGITAL TRANSFORMATION

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## Abstract

#### Organization Profile

YOKE Industrial Corp. is world's top three manufacturers of industrial lifting accessories and fall protection equipment.

- Approximately 450 employees in Taiwan. All of its production bases located in Taiwan, with three plants situated in Taichung and Changhua.
- Main products: industrial lifting accessories, contributing to 30% of the revenue; and the fall protection equipment makes up about 70%.
- Products reach more than 45 countries in collaboration with more than 100 distributors.
- Product market in 2021: American market accounts for 56%; followed by Europe 24%; and then Asia 16%.
- Market share of the fall protection equipment reaches 65% worldwide.

#### Participants

Steven Hong, Chairman, YOKE Industrial Corp. Tom Lin, CEO, YOKE Industrial Corp.

#### Audience

Digital transformation leaders

#### **Business Challenges**

- Difficulty in attracting talents: Traditional manufacture is a mature industry, which results the stagnated growth. Additionally, the working environment is harsh. Young labors and top-notch talents have become less drawn to this field of work.
- The knowledge of the seasoned technicians is inherited by the next generation through manual records, making it a challenge to preserve experience digitally: Seasoned technicians in the traditional industry preserve all R&D technologies and knowledge in their minds, with the majority of the information kept in written form. It will hinder the company to utilize digital ways to preserve the professional experience.
- Diversified product lines make management difficult: Diversified product

lines require workers to change the production lines frequently for mixed production; thus, increasing the complexity of management.

• Products must comply with all safety regulations to protect people's lives: It's required to comply with safety regulations of different countries, realizing the assurance of pre-use check and traceability of production.

#### Solutions

- Improve production and operation efficiency through automation: YOKE gradually replaces manual work with digital tools, builds an integrated digital operation platform by optimizing process and connecting different systems, and introduces automation equipment as well as IoT applications to the factory site.
- Create a friendly development environment for digital innovation from the bottom-up: It promotes project activities, such as Total Productive Management (TPM) and Continuous Improvement Team (CIT) to create continuous improvement corporate cultures.
- Scrutinize customers' pain points and develop new products to meet safety compliance requirements: It develops digital products and services to conduct pre-use check by scanning the digital tag with mobile, which can upload and save the data on the cloud to facilitate the safety check of on-site employees and enable the asset owners to manage the equipment status.

#### **Business Results**

- Integrate not only internal core systems across departments but also supply chain resources: The company is committed to improving digital platforms and establishing shared databases, aiming to create an integrated digital operation center. In addition, it also integrates resources of the supply chain manufacturers through the supplier portal, which has accounted for 95% of the company's suppliers.
- Alleviate the problems of labor shortage and knowledge inheritance through automation and intelligent technologies: It introduces automation and intelligent technologies to (1) reduce labor demand by 8.8%; (2)

shorten the knowledge gap, so that the production lines can be managed by young workers with an average age of 37.

- Shape the continuous improvement corporate cultures: From 2021 to 2022, the annual number of improvement proposals reached 87, with 55 launched and completed, resulting in savings of approximately NT\$14.58 million.
- Successfully establish a new business model: A new business ecosystem was built up, with over 100 manufacturers joining it, 90 of which were the company's partners and customers.

#### What You'll Learn

- How did the company alleviate the shortage of talents through digital technology given that the traditional industry hardly attracts talents due to its stagnated growth and poor working conditions?
- How did the company make use of digital technology to preserve the technical skills and knowledge in the face of alteration of generations?
- How did the company integrate information flows to reduce the complexity of operation and management issues while facing demands for diversified products that are highly customized and small volume?
- How did the company develop new products and new business model by standing in customers' shoes to solve their pain points?
- How did the company shape a corporate culture that facilitates grassroots staff to become a driving force of innovation and improvement?

## I. Organization Background

Founded in 1985, YOKE Industrial Corp. has grown into a company with 450 staff. Engaging in traditional metal processing industry, the company placed its focus on two production lines: 8 Series industrial lifting accessories and N Series fall protection equipment. The company's products are mainly used in 7 fields, which include: offshore wharf, construction engineering, logistics handling, mining engineering, mold lifting, wind power generation, maintenance and repair.

Headquartered in Taiwan, the company gradually established its subsidiaries in China and Vietnam as well as bases in Germany, Canada, South Korea, and Thailand in the form of joint venture. With more than 100 distributors all over the world, currently the company's products are sold in over 45 countries. At the moment, the company continues its expansion of their product sales and services. The company's industrial lifting hooks have been ranked among the world's top 3. In addition, the fall protection equipment occupies 65% of the global market.



Fig.1: Steven Hong, Chairman of YOKE

Compared with other industries, YOKE has four distinct characteristics:

	The traditional metal products require heat
Arduous working	treatment and forging during the processing,
conditions	making the workplaces dangerous, hard, and
	noisy.
Apprenticeship system	The technological skills and knowledge owned by
	seasoned technicians need to be passed down to
	apprentices so that the experience can be
	inherited.
	Products are highly customized with small
Dominated by	volume, which are profitable but hard to scale up.
customized production	Moreover, different product portfolios will also
	increase the complexity of management.
Required high product	Products have to support various industries in
safety and quality,	need of lifting operations so that safety is the
emphasizing the	priority. The use of lifting products and pre-use
importance of	check shall also be in line with safety regulations
regulatory compliance	of countries.

## II. Impetus for Digital Transformation

1. The maturity of the traditional manufacture along with its harsh work environment makes it difficult to attract talents

The difficulty in attracting new talents is two-fold. First, as a result of the maturation of the traditional manufacturing industry, its growth rate has become stagnated. Second, harsh work environment (e.g. heat, noises, and flying scrap iron) plus the remoteness of the factory location also contribute to the problem. Not only are young people reluctant to join in, but the industry itself has a hard time competing for first-class talents with other industries, which ultimately lead to a labor gap and shortage of workers. For example, according to the statistics of Directorate-General of Budget, Accounting and Statistics, Executive Yuan, the total shortage of workers in Taiwan is as high as 248,000 in 2021, of which the manufacturing industry is ranked first with

91,000 workers, accounting for  $36.7\%^{1}$ .

2. The high dependence on the experience inherited from seasoned technicians makes it hard to promote digitalization

In the old days, the traditional manufacture heavily relied on seasoned technicians to teach newbies unique techniques, and it took at least 10 years to cultivate a professional master. As seasoned technicians reach the age of retirement one by one, all the technological skills and related knowledge of the industry goes with them without any successor. Additionally, the absence of standardized process and data because of the manual record of work process makes it difficult to go digitalization. How to pass on the experience has been a tough nut to crack.

3. The ever-diversified product lines and mixed production give rise to highly complicated management

The company has been focusing on industrial lifting accessories and fall protection equipment, which can be applied to all kinds of lifting operations. With the emergence of different industries, the products are characterized by highly customized demands. So far, the company has as many as 4,000 products. As product lines are diversified and the manufacturing processes are complicated, production lines need to be changed frequently for mixed production, which increase the difficulty in management.

## 4. The reliability and traceability of pre-use check is vital for maintaining product safety

Since product safety is regarded as the top priority, the laws of each country have stipulated various regulatory compliance and documentation requirements, such as Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) by the U.K. and ASME B30.26, safety standards formulated for ropeway, sling and lifting equipment by American Society of Mechanical Engineers (ASME). These regulations have provided specifications for pre-use

<sup>&</sup>lt;sup>1</sup> Directorate-General of Budget, Accounting and Statistics, Executive Yuan, *Results of the Employment Survey (Job Vacancy Profile) in 2021*, Retrieved from https://www.stat.gov.tw/ct.asp?xItem=48015&ctNode=6214&mp=4 (Accessed on 31st Aug. 2022).

check process and check record preservation. Typically, the records must be preserved for 10 years for traceability, and the accumulated papers not only take up a large space, but also are unfavorable to preserve and query.

### **III. Digital Transformation Strategies**

1. From standardization to semi-automation and to full intelligent technologies

The digital transformation of the company takes a gradual approach, starting with standardization, then systematization after employees become familiar with standardization systems. At the beginning of the systematization, simple data tools such as Excel will be adopted to digitalize the repetitive operations. The company shall only consider how to introduce automated or smart systems for further improving production and operation efficiency once the processes are gradually on track, running smoothly, with data and records all well-preserved and executed.

# 2. From enterprise-led digital transformation to digital citizen-led continuous improvement

For an enterprise to achieve digital transformation, two forces are required to complement each other so that continuous improvement can become a reality: on the one hand, an enterprise must lead from the top down to quickly scale up the digitalization through large-scaled projects; on the other hand, employees are required to constantly come up with new ideas and improvement proposals from the bottom up to keep moving.

Grassroots employees of traditional industry, however, are prone to reject new technologies and need time to adapt. Therefore, the company creates a digitally friendly environment for developing innovation from the perspectives of grassroots, sets up a mechanism for employees to participate in activities, and tries to reduce their rejection to digital transformation. Moreover, the company also inspires grassroots' digital creativity by praising the teams for their proposals to shape a culture of continuous improvement and experience sharing among them.

3. Strive for not only operational excellence within the company but also new business opportunities on the way to platform economy

YOKE not only pursues internal operational excellence through digital transformation, but also observes customers' pain points to develop new business model. Since safety is the company's first priority, lifting equipment manufacturers and asset owners are required to comply with the safety regulations of countries on lifting equipment for the reliability of pre-use check and data traceability. Companies that fail to comply with the code will be subject to heavy fines or prison sentences if people are injured or killed.

For example, a British company was fined 160,000 pounds for violating the LOLER after an investigation into its failure to conduct a risk assessment and set up protective measures to prevent personnel from touching the antenna, which ultimately resulted in the electrocution of a worker operating a truck crane.<sup>2</sup>

YOKE prioritizes customer experience, focuses on their demands for regulatory compliance, and develops the products that comply with the international regulations. Since then, the company has opened its way to platform economy, expands its products and services ecosystem, going from internal excellence to beyond.

 $<sup>^2</sup>$  Safety & Health Practitioner, 2021, £160k fine for scaffolding company after crane operator electrocuted, Retrieved from

https://www.shponline.co.uk/lifting-and-handling/160k-fine-for-asl-access-scaffold-after-crane-operato r-electrocuted/ (Accessed on 14 Sep. 2022).



Fig. 2: Digital Development Strategy of YOKE

#### **IV. Implementation Approaches**

- 1. Digital automation for improving production and operation efficiency
- (1) Standardized integration of information flows to create digital operation platform

YOKE introduced Enterprise Resource Planning (ERP) to manage its production and operation activities back in 2010. After more than a decade, the company decided to turn its ERP into a cloud-based one, considering that the cloud could provide it with a more efficient collaboration platform. However, great changes have taken place to business processes from 2010 to 2021. To improve process efficiency, before the cloud was launched, the company re-examined more than 700 process activities to ensure process rationalization, optimization, and standardization. The company believes that only right processes and systems can ensure the accuracy of the data, which can be used as the basis for decision-making and improve the decision quality.

Given the high demand for customization of YOKE's products and the increasing complexity of product line management, the company expects to integrate information flows and improve internal operation efficiency. The core system is on ERP and interconnects with other platforms for production, R&D, manufacturing, warehousing, purchasing, and customer relationship management. The company plans to build a data warehouse to integrate all the data and create an integrated digital operation center in the future. The company's current focus is on improving its digital platforms and establishing respective databases of their own, gradually linking them to each other and moving towards the enterprise war room, where each department can have its own dashboard, thereby enhancing real-time decision-making efficiency.



Fig. 3: Planning Framework of Digital Operation Platform

YOKE's digital transformation is not only taking place within the company, but also collaborating with upstream and downstream supply chain manufacturers to facilitate resource integration. The company introduced the supplier portal in 2021. Up to now, the number of online suppliers has accounted for 95% of suppliers, so that the supply side can also deal with orders through the platform. In the past, there were delivery errors caused by the suppliers' delivery orders without uniform specifications, handwriting errors, and illegible handwriting. Now, when the suppliers make the delivery orders, they can directly click the purchase orders to be delivered on the platform and check the delivery status at any time. The warehouse receipt printed from the platform has also been standardized in format and attached with QR Code, so that the material control personnel can directly scan the barcode to simplify the receiving procedure.

In consideration of the small scale of some suppliers, the platform helps suppliers bear part of the business management needs. The relationship between the company and suppliers is closer thanks to information sharing. At the same time, it allows suppliers to experience the benefits of digital platforms and recognize the advantages of digitalization, which integrate the suppliers into the company's smart ecosystem.

(2) Promote automation and intelligent technologies on the factory site In order to cope with the shortage of manpower, YOKE implements shop floor management through process automation in factories, such as robot arms, automatic boxing, and automatic warehousing systems in hopes of reducing the labor cost so that manpower can be invested in activities with more productive value. In addition, the company collects data in the factories through IoT, integrates data flows, and makes real-time decisions on the state of machines. With more and more data flooding into the company, the development of artificial intelligence has improved the efficiency of data processing to a new level, enabling the quality and speed of the data driven decision-making to reach even greater heights.<sup>3</sup>

For example, YOKE created an automated assembly line in its industry. Before the automation, it took 13 staff members to complete the processes from assembly, riveting, inspection, stamping to packaging. But with automation, it

<sup>&</sup>lt;sup>3</sup> PwC Taiwan, 2021, *Initiating Digital Transformation -- Distance from Competitors*, Retrieved from <u>https://www.pwc.tw/zh/news/press-release/press-20210820.html</u>. (Accessed on 28 Aug. 2022)

took just three workers to complete the assembly work of the whole production line. The time to change production lines was reduced from 60 minutes to 10 minutes, with the efficiency improved by 83%, unit cost reduced by 35%, and achievement of zero customer complaint for rivet missed as well as zero case of work accidents.



Fig. 4: Automatic Assembly Line

Additionally, in the stage of forging, it is necessary to strike the materials with the power of stamping equipment so that the materials can be cut, bent, formed into the shape or size required by the mold to create the finished product. By installing sensors to the stamping equipment, YOKE connects the equipment to a private network to collect and transmit production data in real time, and to update equipment status at any time to cope with machines in abnormal state. Furthermore, the smart dashboard of machine is used to present the planned production volume, activation, yield rate, equipment management report, operation status and other information so that employees can timely grasp the current situation of the production lines. In terms of intelligent technologies, YOKE trains flash welding machines on how to optimize process parameters through device digitalization and AI models and seeks to judge the optimal temperature for workpiece to weld and joint in the flash welding process in a scientific way. In the flash welding of metal products, it used to rely on the seasoned technicians to observe the spark in the manufacturing process to judge whether the temperature was proper, and to determine the quality of the workpiece by comparing the finished product state based on their personal experience and skills.

However, as seasoned technicians gradually retire one after another while foreign machines and technical advisers cost a lot, YOKE started with data collection by recording the output result of setting different parameters and comparing the final product condition. With the data recorded, the optimum processing temperature range of the product can be calculated by simulation. Through the AI model establishment, the company took it one step at a time to determine the ideal parameter range for successful flash welding, which then allowed equipment to conduct production with stable quality according to this parameter setting. By replacing seasoned technicians' experience with AI technology, it not only reduces the need for manpower, but also standardizes the quality of the products to ensure good manufacturing yield rate.

- 2. Initiate culture building to create a development environment for digital innovation from the bottom up
- (1) Create cultures of continuous improvement to inspire grassroots for brainstorming new digital ideas

To successfully promote the digital transformation, both the top-down enterprise-led and bottom-up employee-led efforts should be made so that the new ideas can turn into a continuous drive for consistent innovation.



Source: PwC Taiwan Fig. 5: Two-Way Drives for the Enterprise to Promote Digital Innovation

However, in the promotion of digital transformation, how employees adapt to digital tools in a short-term is a problem faced by most enterprises. According to 2021 Taiwan SME Digital Transformation Survey released by PwC Taiwan, employees engaging in metal product manufacturing industry may adopt a negative attitude or even resist the use of digital tools because they are often constrained by past experiences, unfamiliarity with digital technology, or worried about their jobs being replaced by digitalization. Even about 30% Taiwanese Small- and Medium-sized Enterprises (SMEs) identify "cultural resistance to change in their organizations" as the biggest challenge in digital transformation.<sup>4</sup>

However, the digital transformation of YOKE is an exception. Steven Hong, Chairman of YOKE said confidently that

<sup>&</sup>lt;sup>4</sup> PwC Taiwan, 2022, 2021 Taiwan SME Digital Transformation Survey, p. 39.

"Many people mistakenly believe that digital transformation or the use of digital tools will cause a lot of internal resistance, which is no longer the case. Now it's the other way around: people are eager to use technology in the workplace and in their lives."

Why can YOKE feel pride to say this? The key is that, by putting people first, YOKE creates a culture of continuous improvement and an organizational climate that encourages employees to embrace digital tools, thereby creating a positive cycle of trying new things. The company has been committed to promoting Total Productive Management (TPM), aiming to maximize the total productivity of the production system and make improvements based on people and equipment, thereby improving the operation system of the enterprise. In recent years, the company has launched the Continuous Improvement Team (CIT) activities to constantly strengthen the corporate system and increase the competitiveness of the company with ever-improving activities and mechanisms.

YOKE's all-staff proposal for improvement sets key performance indicators (KPI) of 100% of participation rate, requiring every staff, including production line operators, to make an improvement proposal regarding their work every month. It is an iterative way to facilitate digital transformation. After problems are identified, processes are sorted out and systems are implemented, the spirit of continuous improvement will encourage employees to brainstorm how to introduce new technologies to keep upgrading. In this way, the company can not only continue the digital transformation, but also keep itself, a SME composed of only 450 people, pioneering the cutting-edge technologies.



Fig. 6: Digital Transformation of YOKE: Iterative Evolution

Over time, the mindset of continuous improvement becomes internalized into active thinking. YOKE, after years of employee proposals, found that employees began to reject manual processing and to think about ways to simplify the work process through digital tools, such as scanning QR codes, instead of writing by hand. This means that changes have gradually taken place in their mindsets, and the digital transformation is no longer an insurmountable technological divide gap for employees, but a tool to help them solve their work problems.

YOKE's proposals for improvement are not only for individuals but also for cross-departmental proposal contest in which the best team receives high praise. Good proposals will be shared among departments as successful cases, prompting other departments to observe and consider whether the concept of others' proposal can be applied their own business. Such to cross-departmental learning and sharing expands the reach of digital thinking to achieve digital empowerment.



Fig. 7: Presentation of CIT and TPM Projects

(2) Actions are better than words. Implementation of proposals to cultivate future digital superstars

Proposals need to be implemented so that changes can be made; otherwise, they'll just be empty talk. YOKE selects two proposals a month from each department, sets up a review committee of senior executives, and asks proposers to report. Senior executives help to implement the proposal considered feasible so that the proposer can actually participate in the proposal. In this way, the proposer will be part of the improvement project, which will help them not to resist the change of work content and reduce the pain of adjustment period. Not only does this give YOKE's employees a chance to grow, but it also gives the company a chance to discover the potential talent in the company and seek the digital talent that can be cultivated in depth.

In addition, YOKE always asks consultants to help with TPM or CIT projects. These kind of project activities usually go through many rounds, with the first round mainly involving a small number of people such as senior or seed staff. During the process, employees with outstanding performance are given the opportunity to serve as coaches or counselors in the second round. As the number of rounds increases, so do more employees involved, which means the number of employees who are capable of acting as coaches or counselors also goes up, in turn accelerating the promotion of the project activities, thereby achieving the purpose of staff training and talent extraction.

- 3. Identify customers' pain points and establish new digital business models
- (1) Paper-based information evolves into cloud-based; RFID digital chip makes sure safety is within one's grasp

Since YOKE's products are mainly used for operators working at height, safety first is the supreme principle. Back in 2017, when going to visit customers in Europe, YOKE found that they all spontaneously raised concerns about regulatory compliance. Since safety is of importance in regard to lifting equipment, the LOLER of the U.K. and many other international codes impose obligations on individuals and companies that own, operate or control lifting equipment, requiring that all lifting equipment should be fit for purpose, appropriate for the task, suitably marked, and subject to statutory periodic thorough examination. All examination records must be kept in a good condition and any defects found must be reported to both the person responsible for the equipment and the relevant enforcing authority.<sup>5</sup>

Safety regulation seems to be simply a routine to ensure equipment safety in use. However, in practice, a series of complicated processes, including staff training, daily pre-use check, periodic check, third-party inspection, are involved, and corresponding inspection documents will also be required for each process. If the supporting documents are not fully provided, the factory may be shut down until all the documents are cleared before it can reopen. In addition to the complete preparation of documents, the problems of timeliness and easy storage of documents also follow.

YOKE, a maker of lifting accessories and fall protection equipment, faces a similar problem. For many SMEs, the traditional lifting safety operations rely on paper, often resulting in safety concerns. For example, workers did not keep traditional safety operation instructional manuals properly, fail to fully record safety testing results, or neglect inspection knowledge and regular test

<sup>&</sup>lt;sup>5</sup> Health and Safety Executive (HSE), "Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)," Retrieved from <u>https://www.hse.gov.uk/work-equipment-machinery/loler.htm</u> (Accessed on 14 Aug. 2022).

processes. In addition, low efficiency of management and maintenance also shortened the machines' duration of service. All of these caused the frequent occurrence of occupational accidents.

With this in mind, YOKE embedded Radio Frequency Identification (RFID) chips into the lifting hook products or attach SupraTag digital tags embedded with RFID chips to products. In this way, the field staff can connect to the cloud management platform by using the RiConnectAPP developed by the partner Ri Connect, Inc. to scan the digital chip with their mobile phones or readers, follow the instructions to complete the pre-use check steps, and check the detailed status of the assets. By doing so, the company can meet the application needs of customers' daily pre-use check and asset management, and also enable all information to be read and remotely accessed on a single platform. It will make product safety information not only transparent but also accessible, which truly implement the pre-use check process and data traceability, creating a triple-win situation for manufacturers, asset owners, and field staff.

With this smart platform, YOKE can quickly and effectively solve safety compliance problems for SMEs. Once, a supplier of wind power industry in Taiwan had to stop work immediately after all lifting equipment was inspected by a foreign wind power customer due to incomplete inspection records and inconsistent inspection data records, which resulted in the closure of nearly 60% of the entire factory. The company later came to YOKE for solutions. YOKE's team helped introduce SupraTag and the RiConnect platform, which solved the compliance problems in about a week, impressing foreign wind customers with their efficiency.

At present, YOKE's RFID SupraTag technology has been granted seven patents, and digital services have been introduced into about 950 products by 2021. More than 100 companies have joined the safety digital ecosystem, including some from Taiwan. YOKE's RFID SupraTag solution can also help companies improve their corporate social responsibility (CSR) by digitizing traceability. The company reckons that it takes at least 60 sheets of inspection data for a product, which must be kept for 10 years. Since the company produces more than 40 million hooks a year, going digital not only ensures that information is readily available but also saves more than 12.4 billion pages of paper each year, which is equivalent to 5 times of all trees on Ali Mountain. Hence, the paperless asset information management and transmission not only facilitates the safety practice of the company, but also contribute significantly to environmental sustainability.



Source: YOKE





Fig. 9: Mobile User Interface of RiConnect APP

(2) Product manufacturers seize the opportunity to join digital platform economy, extend services, and create new business models Considering that the RFID SupraTag digital chip application and its digital solution are completely different from YOKE's existing business model, the company has expanded from a safety products supplier with manufacturing mindset to a smart solutions supplier with technological thinking through co-development with its partners.

YOKE's expansion from a manufacturer of industrial hooks and fall protection equipment to a new RFID SupraTag smart solution aimed at customers' pain points is a big business model shift: first, the hardware and software of RFID SupraTag itself is a set of new products that are profitable; second, in terms of data application, the big data collected by SupraTag and analyzed by the RiConnect platform can be used as a basis for product development and improvement, such as predicting the limit of use of products for preventive maintenance. Finally, YOKE has developed occupational safety training and education courses. By designing four types of courses such as online courses, live online courses, field courses, and customized training, the company can operate different business models, organize different revenue structures, and create new business opportunities.

Looking into the future, YOKE is ambitious to increase platform economic benefits in other related industries or fields that also pay attention to the reliability and traceability of the safety inspection processes by promoting SupraTag and its compatible platform, so as to build a safe and digital ecosystem. By doing so, while practicing its commitment to safety, YOKE also enables itself to lay a foundation for its growth by developing new business models.

#### V. How to Measure the Benefits of Digital Transformation?

Being the manufacturer of equipment for lifting operations, YOKE's core value can be condensed into "safety is our first priority." The ultimate and core focus

of the company's digital transformation involves how to keep learning and innovating, so as to show the value of "safety" and "sustainability" to the world while developing the markets of industrial lifting hook and fall protection equipment. Through the establishment of digitally friendly environment credited to the continuous improvement cultures, the company incorporates operation and management, corporate cultures, and new business model development to serve as the target to measure the benefits of digital transformation, which in turn transforms into a driving force of growth for the future.

	Integrate not only internal core systems across departments
	but also supply chain resources: YOKE has been committed
	to improving digital platforms and establishing shared
	databases, aiming to create an integrated digital operation
	center. In addition, it also integrates resources of the supply
Operation	chain manufacturers through the supplier portal, which has
and	accounted for 95% of YOKE's suppliers.
Management	• Alleviate the problems of labor shortage and knowledge
	inheritance through automation and intelligent
	technologies: YOKE introduces automation and intelligent
	technologies to (1) reduce labor demand by 8.8%; (2)
	shorten the knowledge gap, so that the production lines can
	be managed by young workers with an average age of 37.
	• Shape the continuous improvement corporate cultures:
Corporate	From 2021 to 2022, the annual number of improvement
Cultures	proposals reached 87, with 55 launched and completed,
	resulting in savings of approximately NT\$14.58 million.
New	• Successfully establish a new business model: A new
Business	business ecosystem was built up, with over 100
Model	manufacturers joining it, 90 of which were YOKE's partners
Development	and customers.

#### VI. Critical Success Factors

1. Leadership team needs to have digital mindsets and embraces digital transformation

As digital technology changes faster than ever before, YOKE emphasizes that companies need management talents to establish digital mindsets, so as to lead companies to find new value through digital transformation. PwC also points out that an enterprise leader must be both strategists and implementers, who is tech-savvy, humanity-focused, and capable of discovering differentiation through digitalized actions to achieve sustainability, thereby leading the enterprises to find their place on the global stage while creating unique values for customers and society.<sup>6</sup>

#### 2. Be enthusiastic for and curious about new digital technology

PwC Taiwan, 2021 Taiwan SME Transformation Status and Demand Survey, pointed out that compared with other manufacturing industries, the metal products manufacturing industry is slower and more conservative in introducing digital tools due to the resistance to digitalization.<sup>7</sup> However, compared with other companies, which are hesitant about new technologies or prefer to use mature ones, YOKE is enthusiastic and curious about emerging digital technologies. YOKE lays more emphasis on thinking about how to apply new technologies to enterprises, which makes it become a pioneer to initiate new digital projects one after another. As a result, although YOKE is a SME, it always introduces the latest systems and technologies, and spares no effort to be the forerunner in the industry.

#### 3. Guide the employee to continue digital innovation; thus, shaping the enterprise's positive recognition of digitalization

By creating a culture of continuous improvement within the enterprise through the project and activity mechanism, YOKE enables employees to have the flexibility to try new things, stimulate new ideas to propose improvement

<sup>&</sup>lt;sup>6</sup> PwC Taiwan, 2022, PwC: Beyond Digitalization -- Seven leadership Keys to Success or failure in enterprise Transformation, Retrieved from

https://www.pwc.tw/zh/news/press-release/press-20220408.html. (Accessed on 11 Sep. 2022)

<sup>&</sup>lt;sup>7</sup> PwC Taiwan, 2022, 2021 Taiwan SME Digital Transformation Survey, p. 41.

plans for the current system application, and continue the circular engagement in digital innovation. At the same time, employees can witness the digital benefits repeatedly in this process and have confidence in the continuous investment so that they will gradually agree with the practice of digital transformation. As Tom Lin, CEO of YOKE, said in the interview that:

"The problem I have now is the company has formed the culture where they (employees) chase after me to strive for new IT application systems. It was not me to propose whether we should introduce the systems. It was they who came up with digital solutions to problems."

#### VII. Lessons Learned

YOKE's digital transformation narrates a story that even a SME can make good use of technology to solve the challenges as long as it has the perseverance to establish a bottom-up culture for continuous improvement to provide the driving force for transformation. In YOKE's case, it standardized integration of information flows, tried to develop digital operation platform for operational improvement and decision-making quality, as well as promoted automated and smart applications to the factories. These strategies not only alleviate labor shortage, but also replace the seasoned technicians' experience with technologies, thus ensuring the consistent product quality.

According to PwC Taiwan, the digital transformation of enterprises should accelerate the transformation in a speed and act like a startup. Enterprises should develop unique digital capacities in regard to culture, resource, business process, ability, customer, and market characteristics to show their differences and distance themselves from the competitors.<sup>8</sup> Under such context, YOKE can be regarded as the best case of tapping into the service potential of its own industry through its constant pursuit of digital innovation and its delicate insight into customers' pain points on safety and regulatory compliance. All of these grants the company the opportunity to develop a new

<sup>&</sup>lt;sup>8</sup> PwC Taiwan, 2021, *Initiating Digital Transformation -- Distance from Competitors*, Retrieved from <u>https://www.pwc.tw/zh/news/press-release/press-20210820.html</u>. (Accessed on 28 Aug. 2022)

niche market.

Limited by resources, digital skills, planning abilities, etc., SMEs often come to a stalemate. However, the rapid development of new technologies has dramatically changed consumer patterns and industrial boundaries. From the case of YOKE, it can be learned that the choice of digital tools may not be the core concerns of digital transformation, but rather the enterprise's absolute determination to push itself to become a high-tech enterprise. In this way, companies can be equipped to solve future problems, thereby continuing to grow and thrive.