２０２３年度

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受賞報告講演要旨

Bangkok Komatsu Company Limited

1. Corporate Profile

1.1 Overview

Bangkok Komatsu Co., Ltd. (BKC) is an overseas group company of Komatsu Ltd. (KLTD) and was established in 1995 by a joint venture with Bangkok Motor Works (BMW) in order to expand the Thai market. BKC has started local production of 20t class hydraulic excavators for Thai market and has expanded production.

Since then, BKC has expanded exports to Southeast Asia, North America, and Latin America to meet global demand, and has established its position as a global cross-source base.

The scale of the company is shown in Table 1.1.1, and the factory site includes Welding plant F1, Assembly plant F2, Warehouse for Spare parts, and Casting plant. BKC has production activities in this area.

In addition to the production of construction machinery, Bangkok Komatsu Industries (BKI), which manufactures casting parts, was integrated in 2014.

In 2015, BKC also started the spare parts business and has been strengthening our business as a global production base for construction machinery and parts. BKC has a history as shown in Table 1.1.2.

Table 1.1.1. Scale of BKC

Company Name	Bangkok Komatsu Co.Ltd (BKC)
Established	2 November 1995
Registered Capital	620 MillionBath (19millionUSD)
sales	16,608 M THB (As of Mar '23)
Business	Manufacturing of small and medium-size construction machinery(HE, WA). Business of Casting Parts & Spare Parts
Area	161,276 Sqm2
No. of Employee	1,023 employees (As of July '23)
Shareholder	Komatsu Asia & Pacific Private: 75% Bangkok Motor Works Co.Ltd: 15% Dr.Phornthep Phornprapa: 10%

Total Area: 161,276 M² (Approx. 3.5 times the size of Tokyo Dome)
Casting 33,724 M² / Welfare 10,724 M² / Machine 117,528 M²

Table 1.1.2.BKC history and sales trends

1.2 Major products

BKC's main product is the 20t class hydraulic excavator, which accounts for more than 70% of the total. BKC has expanded its production models to meet customer needs and also offers special specifications. BKC also handles Casting parts and spare parts and provides them globally. Figure 1.2.1 shows BKC's major products.
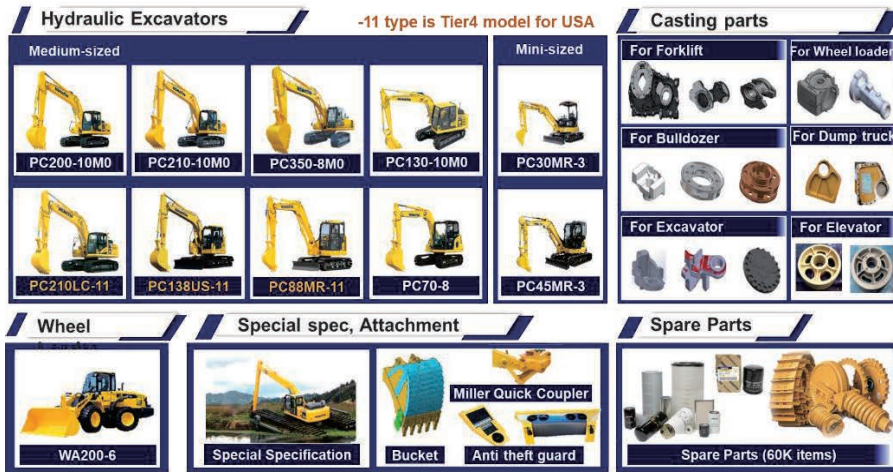
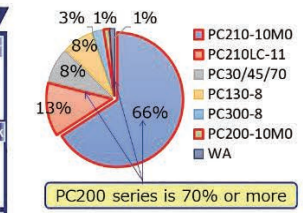— 129 —

Figure 1.2.1 BKC's Major products

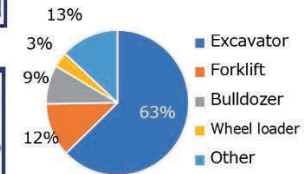Figure 1.2.2. Machine Production ratio

PC200 series is 70% or more

Figure 1.2.3. Casting Production ratio

1.3 Business structure and its characteristics

The business flow and business deployment of BKC are shown below. The value chain in Thailand has an organization from Asia Product Planning(APP) to Asia Training & Demonstration Center(ATDC), and business operations in Thailand have a consecutive system from product planning, production, and sales, to after-sales service. This is a beneficial value chain for BKC and also our strength. BKC is deployed in three businesses construction machinery, casting, and spare parts. BKC not only manufactures products developed by KLTD, and has a role to meet customer needs. BKC develops its business in collaboration with these related departments in order to fulfill its role. In particular, the relationship with BKS and APP is important for BKC to collect market information and provide products that meet needs, and BKC is developing its business by strengthening cooperation. BKC also works in collaboration with its parent company, KLTD, and operates under a clear division of roles. BKC is more than just a manufacturing plant, we are developing our business to provide new value to our customers. Table 1.3.1 shows the business characteristics and role of BKC.
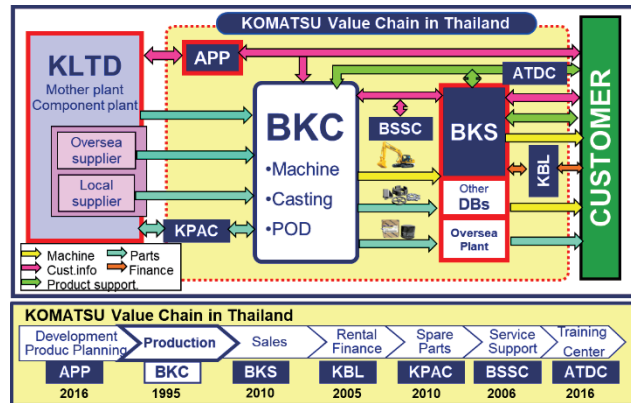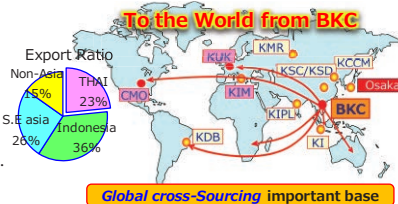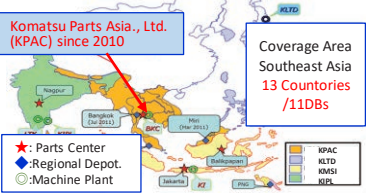
Figure 1.3.1 BKC's Business flow

Table 1.3.1 Business deployment and characteristics

BKC business	Business characteristics	Role of BKC	Role of KLTD
(1)Construction machinery since 1995	◆ Export to countries around the world. **(14 countries)** ◆ BKC can also be produced the latest **model (Tier 4) for the USA.** ◆ **Over 70% export** ratio. ◆ Majority is 20-ton class	・Reflect customer needs in products. ・Production to meet global demand with best QDC ・Expansion of localization	・Development of new products ・Global Hanseizai planning. ・Production technology support
(2)Casting parts business since 2014	◆ Ships to Komatsu Group **in 5 countries** around the world. ◆ Also **sells to local companies**. ◆ **Castings are also machined** to produce high-added-value products.	・Casting production with high added value ・Expand casting procurement in Thailand	・Design of casting parts ・Technical development and support
(3)Spare parts business since 2015	◆BKC **undertakes parts operations from KPAC.** ◆ Quick delivery by taking **advantage of BKC's procurement and logistics strengths**.	・Supply spare parts on time with the optimal inventory to Southeast Asia.	・Global inventory planning. ・Quality control of spare parts

BKC collaborates with KLTD and provide new value that meets customer needs

2. Organization Structure and Management
2.1 Organization and main work contents
The organization and main work contents of BKC are shown in Figure 2.1.1.

BKC Organization & Main job function

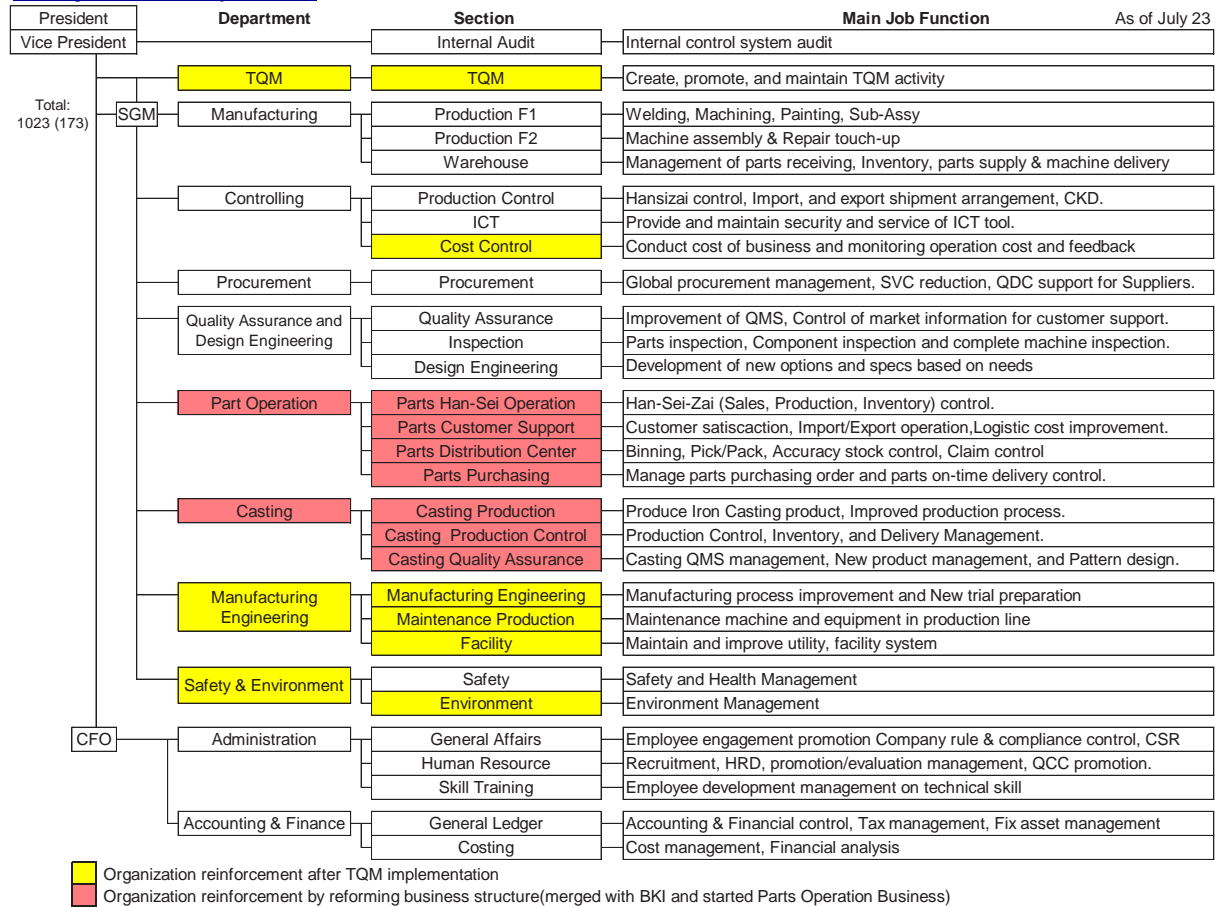| Department	Section	Main Job Function	As of July 23
	Internal Audit	Internal control system audit	
TQM	TQM	Create, promote, and maintain TQM activity	
Manufacturing	Production F1	Welding, Machining, Painting, Sub-Assy	
	Production F2	Machine assembly & Repair touch-up	
	Warehouse	Management of parts receiving, Inventory, parts supply & machine delivery	
Controlling	Production Control	Hansizai control, Import, and export shipment arrangement, CKD.	
	ICT	Provide and maintain security and service of ICT tool.	
	Cost Control	Conduct cost of business and monitoring operation cost and feedback	
Procurement	Procurement	Global procurement management, SVC reduction, QDC support for Suppliers.	
Quality Assurance and Design Engineering	Quality Assurance	Improvement of QMS, Control of market information for customer support.	
	Inspection	Parts inspection, Component inspection and complete machine inspection.	
	Design Engineering	Development of new options and specs based on needs	
Part Operation	Parts Han-Sei Operation	Han-Sei-Zai (Sales, Production, Inventory) control.	
	Parts Customer Support	Customer satiscaction, Import/Export operation, Logistic cost improvement.	
	Parts Distribution Center	Binning, Pick/Pack, Accuracy stock control, Claim control	
	Parts Purchasing	Manage parts purchasing order and parts on-time delivery control.	
Casting	Casting Production	Produce Iron Casting product, Improved production process.	
	Casting Production Control	Production Control, Inventory, and Delivery Management.	
	Casting Quality Assurance	Casting QMS management, New product management, and Pattern design.	
Manufacturing Engineering	Manufacturing Engineering	Manufacturing process improvement and New trial preparation	
	Maintenance Production	Maintenance machine and equipment in production line	
	Facility	Maintain and improve utility, facility system	
Safety & Environment	Safety	Safety and Health Management	
	Environment	Environment Management	
Administration	General Affairs	Employee engagement promotion Company rule & compliance control, CSR	
	Human Resource	Recruitment, HRD, promotion/evaluation management, QCC promotion.	
	Skill Training	Employee development management on technical skill	
Accounting & Finance	General Ledger	Accounting & Financial control, Tax management, Fix asset management	
	Costing	Cost management, Financial analysis	

President / Vice President
Total: 1023 (173)
SGM / CFO

🟨 Organization reinforcement after TQM implementation
🟥 Organization reinforcement by reforming business structure(merged with BKI and started Parts Operation Business)

Figure 2.1.1 BKC Organization & Main job function.

2.2 Major Meeting
BKC holds regular internal and external meetings to ensure smooth business operations and communication between organizations (Table 2.2.1). These meetings are important meetings for BKC to promote TQM, and are systematized in the system chart.

Table 2.2.1 BKC's Major meeting

	Category	Title	Hosted by	President	VP	CFO	Others	Freq.
INTERNAL	Management	BOD Meeting	Administration dept.	O	O	O	Other Directors,Auditors	4/Year
		Strategy review committee Meeting	Controlling dept.	O	O	O	all AGM up	Quarterly
		GM Meeting	Administration dept.	O	O	O	all AGM up	4/Month
	Safety	Safety & Environment Meeting	Safety dept.	O	O	O	Safety committee	1/Month
	Quality	Quality Meeting	QAD dept.	O	O	O	MFG, PU, QAD, PC, CQA, etc.	1/Month
		Customer information Meeting	QAD dept.	O	O	(O)	PC, MFG, Procurement, APP	1/Month
	Planning & Production	Production Meeting	Controlling dept.	O	O	O	PC, MFG, GA, ME, etc.	1/Month
		E-project Meeting	Controlling dept.	(O)	(O)	(O)	PC, MFG, QAD, ME, etc.	2/month
		ICT Meeting	Controlling dept.	(O)	(O)	(O)	ICT Team.	1/Month
	Cost	Cost Meeting	Controlling dept.	O	O		All AGM up	1/Month
EXTERNAL	Management	Top management Meeting (BKS,BKC,BSSC)	BKS	O	O		QAD,PC & BKS Team	1/Month
		Thai Management Committee(TMC)	KLTD MKT div	O	O	O	All AGM up.	2/Year
		Asian Plant Manager Meeting(APMM)	KLTD Prod. Div.	O	O	O	All AGM up.	2/Year
	Planning & Production	BKC-BKS Hansei Meeting	Controlling dept.		(O)		PC Team & BKS Marketing	2/Month
		BKC-Asia div. Hansei Meeting	KLTD MKT div		(O)		PC Team & KLTD Marketing div.	2/Month
		BKC-Osaka Hansei Meeting	Osaka plant		(O)		PC Team & KLTD CKD Team	2/Month
		Thai Midori-kai Meeting	Procurement	O	O		PU & All Thai Midorikai supplier.	Every 2 month
	Quality	BKS-BKC Quality Meeting	QAD dept.	(O)	(O)		QAD Team, BKS team	3/Month
		Thai Regional QA Meeting	BSSC	O	O		QAD Team, BKS Team & KLTD	2/Year

Attendee Members
O=attend, (O) attend for the time being

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3. Business Objective and Mid-term strategy
3.1 BKC Mission and Vision
BKC's corporate value is the sum of the trust and happiness of all people, and BKC pursues customer value to increase this corporate value. Figure 3.1.1 shows the direction of BKC's TQM activities.

BKC sets a mission and develops activities toward a vision in order to increase customer value and connect it to the existence value of the company.

BKC aims to improve corporate value and has set the following missions in order to show the significance of its existence.

In addition, customer value for BKC is defined as making customers smile with BKC products, and aiming at this, BKC has a vision and promotes Business Quality Management.

BKC aims to be a company that makes everyone happy with the smiles of our customers, and with the catchphrase "BKC of Smiles", all employees understand what this means and promote our activities.
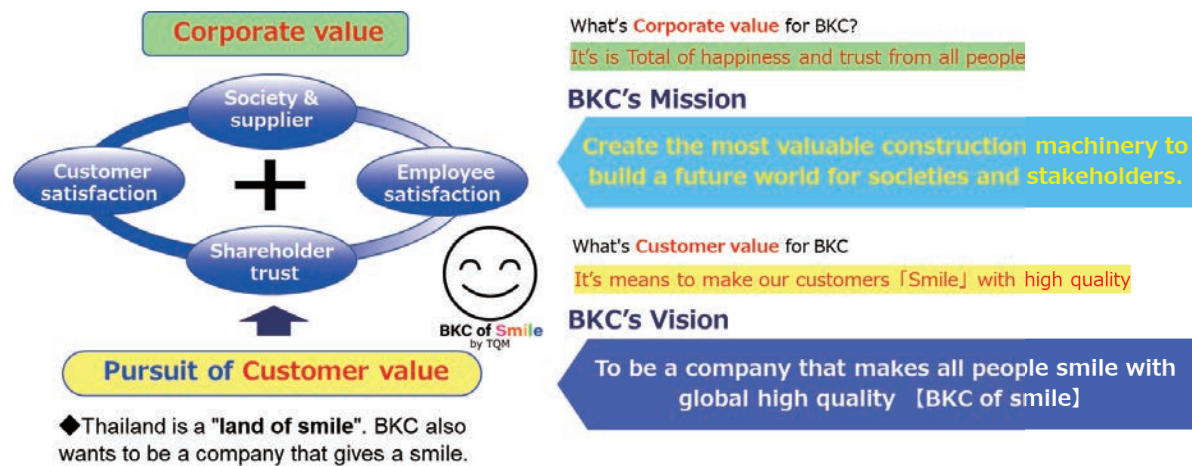

Figure 3.1.1 Direction of TQM activities for BKC

3.2 Background of business objective and Mid-term strategy (environment surrounding business)
3.2.1 Economic situation
As a central presence in Southeast Asia, Thailand conducts economic activities in an important position to support economic growth. The rapidly growing ASEAN countries are expected to continue growing in the future, and the demand for construction machinery is also expected to increase.

While the economy continues to grow, Thailand faces labor shortages and rising wages due to the declining birthrate and aging population. BKC needed to respond to these changes, and to develop human resources for the future, taking advantage of its limited labor force.

3.2.2 Market situation in Southeast Asia
Regarding the market situation in Southeast Asia, Komatsu had been active as a market leader, however, in recent years, the market share had been declining due to the entry of competitors. In particular, the Thai market was in a difficult situation due to the success of competitors. Customers' main business in the Thai market is focused on the construction business to meet the demands of the construction sector. Demand for 20-ton class hydraulic excavators was overwhelmingly high, the customer base was changing to economy users who could handle light work, and the usage and needs were diversifying.

3.2.3 Global Market situation
Global demand has been growing in recent years, especially in North America and Europe. Therefore, BKC's role as a cross-source factory is becoming increasingly important. In 2015, with the expansion of exports of high-spec models to North America, BKC had been working under the slogan of "**Quality first and customer satisfaction to achieve global high quality**". However, in order for BKC to expand its global cross-sourcing in the future, it needed to increase its competitiveness and further strengthen quality.

BKC recognized these changes in the environment and sorted out the issues. Then, BKC set up the business objective and mid-term strategy to become an even more important presence for our customers as a global production base and to ensure the continued growth of our employees and the company.
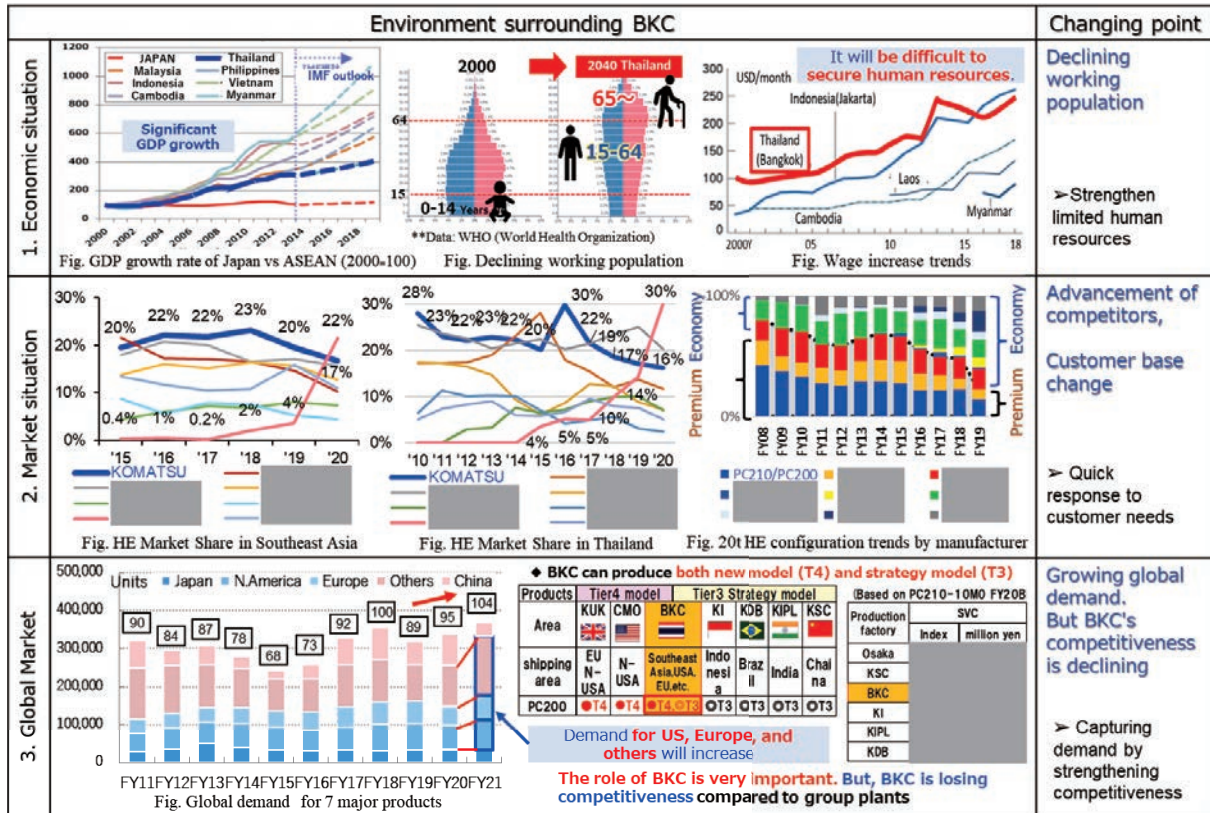
Figure 3.2.1 Summary of the environment surrounding BKC

3.3 Business objective

BKC set the following business objective to realize our vision from the environment surrounding BKC. BKC constantly watches these indicators and they guide us in achieving our vision.

1. No.1 market share in Southeast Asia, 2. Growth of business profitability, 3. Increase employee satisfaction

3.4 Mid-term strategy

BKC researched customer information, needs, and product usage to achieve business objectives. In addition, BKC rented a competing machine, compared the gap with BKC machines, and summarized issues. And then BKC considered strategies using the strategy deployment table from customer needs (Table. 3.4.1).

Based on the analysis results, BKC has set strategies that are the pillars of its vision from the four aspects of **Quality, System, Competitiveness, and Human resources**, formulated a mid-term management plan, and promoted activities toward goals.

BKC has diagrams the direction of its business objectives as shown in Figure 3.4.1 and shares them with employees to promote its activities.

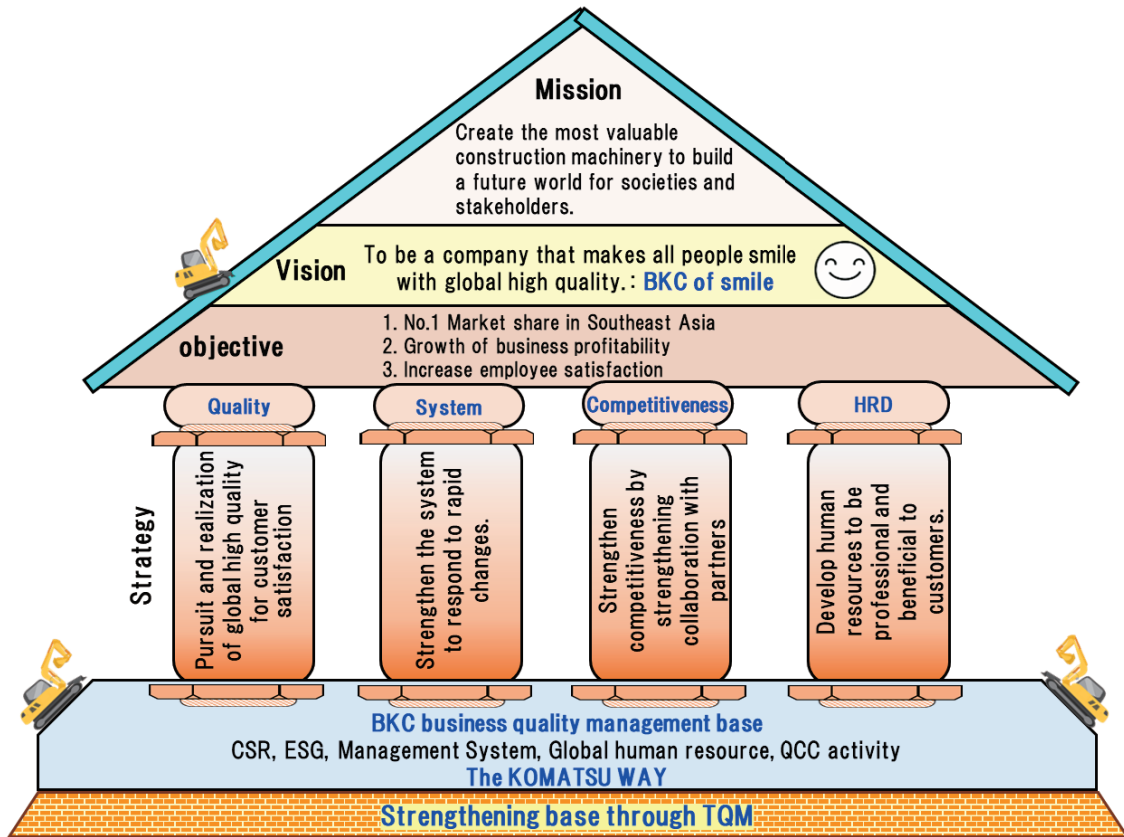Table 3.4.1 Strategy deployment table from customer needs

Figure 3.4.1 BKC's Mission, Vision, Objective, and Mid-term Strategy

3.5 Mid-term management plan and policy management system

BKC develops a mid-term management plan based on strategies that support the vision, and develops policies through Strategy Review Committee. Strategy Review Committee is held every three months to review the status of business objectives, discuss the achievement of targets and implementation of measures for each activity, and lead to the next action. Details of the policy development system are described in Section 5.1.

3.6 BKC's CSR activity

BKC has strengthened CSR activities as a foundation to support its business. BKC has carried out many activities that believes are good for society, but BKC has once again discussed the responsibilities that BKC should fulfill and has clarified the direction of CSR activity and promoted it. BKC must align with KLTD's policies, focus on global environmental protection, and fulfill its social responsibilities. Furthermore, Thailand is in an important position to support the growth of Southeast Asia, and BKC is also on a mission to support the development of the region.

To fulfill these social responsibilities and coexist with the planet, society, and people, BKC would like to contribute to a sustainable society, including the concept of SDGs. From these perspectives, BKC has developed a new **BKC's CSR concept** and has been promoting activities centered on ① **Creating a clean environment** and ② **Developing local human resources**. In the environment, BKC focuses on CO2 reduction and resource conservation and carries out activities in collaboration with KLTD and the local community. In terms of developing local human resources, as BKC's original activity, BKC is expanding the acceptance of internships, giving opportunities to students in rural areas, and developing activities to enrich people's lives.

Figure 3.6.1 BKC's CSR activity

4. Strengthen Business Quality Management by introducing TQM

4.1 Background of TQM activity

BKC needed to further strengthen its strategy to respond to increasingly severe market changes. In order for BKC to continue growing in the future, BKC needed to build a system that could surely achieve its strategy and increase customer value. Therefore, in 2020, BKC introduced TQM activities and strengthened efforts to achieve business objectives. BKC discussed what was necessary to achieve the strategy, and derived what should be practiced through TQM activities.

4.2 Strengthen management base through TQM activity

BKC has broken down what should be strengthened to achieve the strategy and identified activities to strengthen through the following steps.

Breakdown steps
① What is necessary to achieve strategies? (Ideal situation)
② Recognize gaps in the current situation of BKC. (BKC's gap)
③ Clarify the organizational abilities required for BKC.
④ Measures that reinforce those abilities
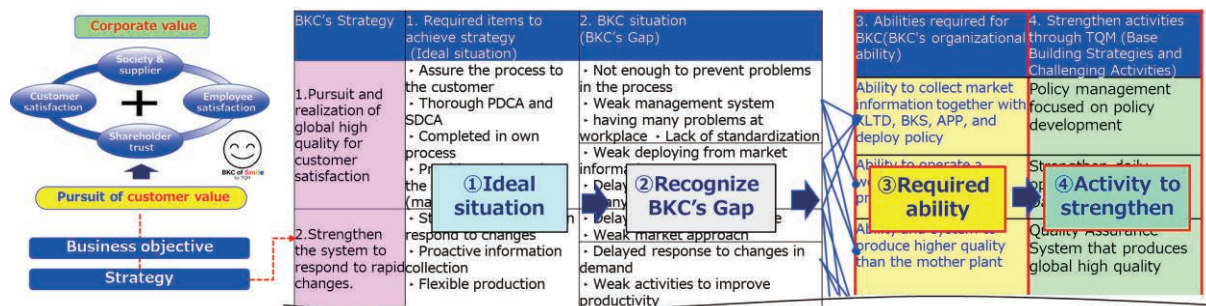
Figure 4.2.1 Breakdown Steps to achieve strategies

BKC discussed BKC's current situation according to these steps, and we recognized the gap between the ideal situation to implement the strategy. Then BKC identified and defined the organizational capabilities needed to fill the gaps. The organizational abilities required of BKC are shown in Figure 4.2.2, and BKC identified activities to practice utilizing TQM to reinforce these abilities.

Figure 4.2.2 Organizational ability for BKC and activity to strengthen

In this way, BKC has recognized the necessary organizational abilities, and set and practiced Base Building Strategies and Challenging Activities utilizing TQM.

Table 4.2.1 visualizes how TQM is relevant to strengthening BKC's organizational abilities. This clarified the relationship between utilizing TQM and the activities to be implemented. BKC has practiced these activities, strengthened its organizational abilities, and worked to achieve business objectives.

Table 4.2.1 Relationship between BKC's organizational abilities and strategic activities through TQM

● : Main   ○ : Sub

BKC's Vision :
To be a company that makes all people smile with global high quality.
[BKC of smile]

Objective:
1. No.1 Market share in South East Asia
2. Growth of business profitability
3. Increase employee satisfaction

Mid-term Strategy				Organizational abilities for BKC	No	Base Building Strategies and Challenging Activities (Strengthen activites through TQM)	Policy management	Daily management	Quality assurance	Production engineering	Production control	Purchasing management	Cost management	Human resource development	Safety/environment	Utilization of ICT and DX	Small group activity/QCC activity	Problem solving, QC tool
Quality	System	Competitiveness	HRD															
Pursuit and realization of global high quality for customer satisfaction	Strengthen the system to respond to rapid changes.	Strengthen competitiveness by strengthening collaboration with partners	Develop human resources to be professional and beneficial to customers.															
Customer satisfaction : >86%	Productivity : 5% up(Sale AMT/pax,)	Sale unit to global market : >80%	TQM Level: 4.0 up															
●	●	●	●	Ability to collect market information together with KLTD, BKS, APP, and deploy policy	5.1	**Policy Management** focused on policy development	●	○	○	○	○	○	○	○	○	○	○	○
●	○	○	○	Ability to operate a workplace with stable products	5.2	Strengthen daily operations through **Daily Management**	○	●	○	○	○	○	○	○	○	○	○	○
●	○	○	○	Ability and system to produce higher quality than the mother plant	5.3	**Quality Assurance System** that produces global high quality	○	○	●	○	○	○			○	○	○	
●		●	○	Ability to analyze the needs of Southeast Asia and develop special specification products	6.1	Development of value-added products that meet regional needs	○		●	○	●	○	○			○		○
○	●	●	○	Ability to provide quickly to global demand and expand cross-sourcing	6.2	Rapidly launch and supply the machines that market demands	○		○	●	●	○	○			○		
		●	○	Ability to expand parts globally with local suppliers	6.3	Expand global procurement by localization	○		○	○	○	●	●			○		
●	●	●	○	Ability to consistently assure from supplier to customer in the casting business.	6.4	Reform Casting Business with new value-added products	○	○	●	○	○	○	○	○	○	○	○	○
○	●	●	○	Ability to innovate business with partners through ICT	6.5	Create new value with partners through ICT	○	○	○	○	○	○	○	○	○	●	○	○
○	○	○	●	Human resource and training system to implement BKC's management system	6.6	Human Resource Development to achieve BKC's Strategies	○	○	○					●	○	○	●	●

Rows 5.1–5.3 are grouped under **Base Building Strategies**; rows 6.1–6.6 are grouped under **Challenging Activities**.

Figure 4.2.3 is a framework that shows the direction of TQM activities practiced by BKC.

BKC has been aiming to maximize corporate value by using TQM to implement strategies and improve organizational abilities. BKC has built 10 strong management systems for TQM and has developed the ability to work based on those systems. And then through its activities, BKC has developed its abilities such as the development of special specifications, expansion of cross-sources, consistent assurance system from suppliers to customers, and business innovation through ICT.
We believe that BKC will become stronger and grow by recognizing this structure well and practicing activities.
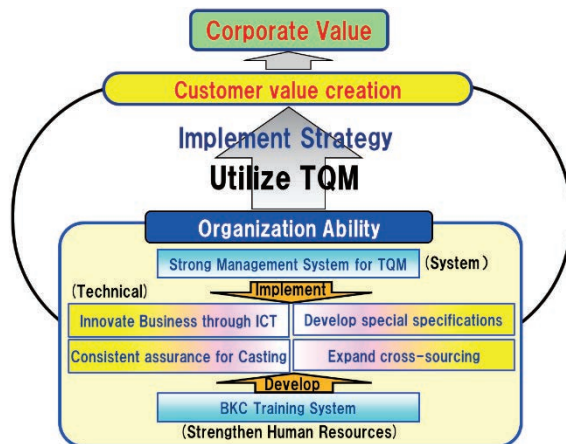

Figure 4.2.3 TQM and Organizational ability Framework

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4.3 Progress of TQM activities

Since BKC's establishment in 1995, BKC has been developing its activities based on the basic policy of manufacturing, "Quality First". In 1999, BKC acquired ISO9002 and carried out quality activities based on the quality management system. Since 2008, BKC has been expanding QCC activities company-wide, and BKC has participated in All Komatsu QC convention and has been able to win prizes. In 2008 and 2014, BKC received a project award from the president of KLTD. Since 2015, BKC has established the Komatsu Way Center and has been conducting activities in order to further promote the Komatsu Way, which is Komatsu's philosophy of action.

In 2019, BKC decided to introduce TQM activities to further strengthen the management base for the future, then in 2020, the president declared the introduction of TQM and announced BKC's vision. And then TQM promotion department was established, and BKC has been working to realize our vision company-wide.

In addition, in order to acquire the knowledge of TQM and proceed with activities efficiently, BKC received guidance from external experts, and the actions to be taken became clearer. As a result, the awareness of all members increased, and activities progressed. The progress of TQM activities is shown in Figure 4.3.1.
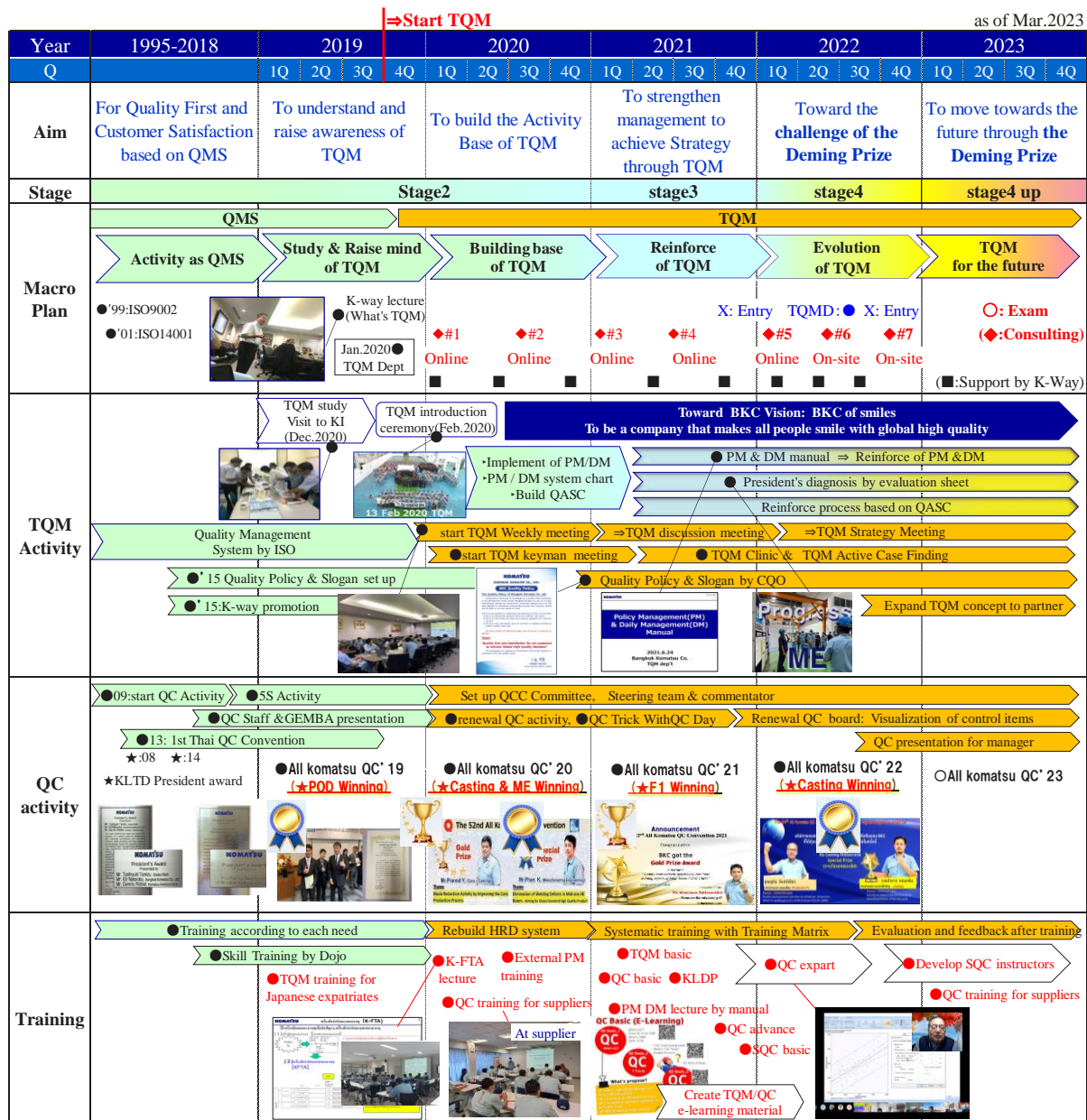

Figure 4.3.1 Progress of TQM activity

5. Practice of Base Building Strategy through TQM activity

After the introduction of TQM, BKC has built and practiced 10 main management systems, as shown in Table 5.1. While practicing TQM, BKC has improved the process of the management system and has brushed up the system. These system charts are always kept with the latest version and maintained and improved.

As a base building strategy, the building and practice of main management systems are described below.

Table.5.1 List of main Management System Chart

As of Mar 2023

No	System chart	Rev.	Plant		
			Machine	Casting	POD
1	Daily Management System Chart	Rev.4	○	←	←
2	Policy Management System Chart	Rev.6	○	←	←
3	Quality Assurance System Chart	Rev.8	○	○	○
4	Customer Feedback Connecting System	Rev.7	○	–	–
5	Cost Control System Chart	Rev.5	○	←	←
6	Hanseizai System Chart	Rev.3	○	○	(in QASC)
7	Human Resource Development System	Rev.4	○	←	←
8	ICT Development System Chart	Rev.7	○	←	←
9	Safety Management System Chart	Rev.4	○	←	←
10	Internal Audit System Chart	Rev.2	○	←	←

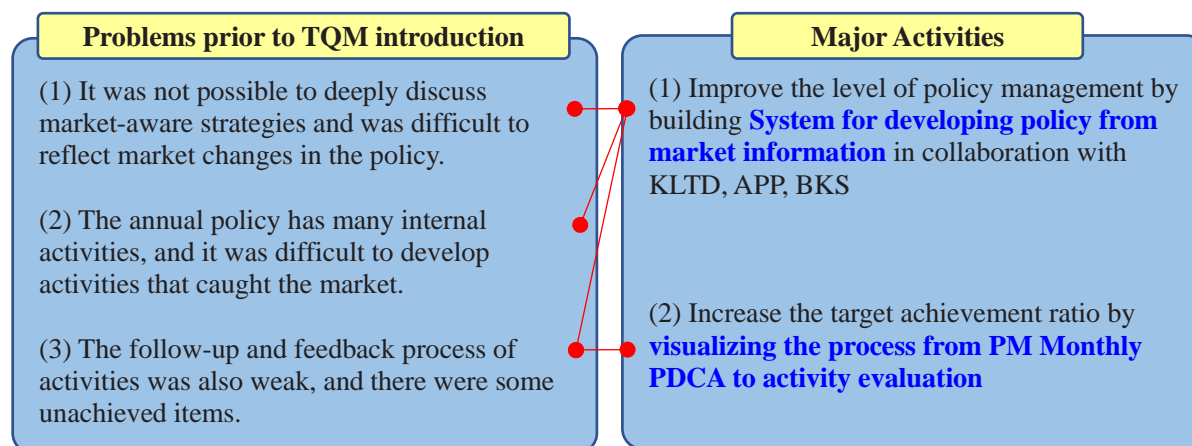### 5.1 Policy Management focused on policy development

5.1.1 Overview

In order for BKC to achieve its strategy, BKC needed to improve the quality of its policy management and strengthen its system to ensure the achievement of its targets. However, before the introduction of TQM, the annual policy had many internal activities, and it was difficult to develop strategically focused activities.

Therefore, BKC strengthened its policy management system to link strategies and policies based on market information and develop accurate policies.

In creating the policy, BKC has gathered market information together with KLTD, APP, and BKS, and has become possible to obtain more detailed information by sharing it at meetings. Then BKC analyzed market needs, created Mid-term Management Plan, and developed important policies at Strategy Review Committee. In the activity development of each department, BKC visualized and strengthened the Process from PM Monthly PDCA to Activity Review.

As a result, BKC has been able to develop policies that consider market and customer needs and improve the level of policy management.

5.1.2 Focus of activities

Problems prior to TQM introduction	Major Activities
(1) It was not possible to deeply discuss market-aware strategies and was difficult to reflect market changes in the policy.	(1) Improve the level of policy management by building **System for developing policy from market information** in collaboration with KLTD, APP, BKS
(2) The annual policy has many internal activities, and it was difficult to develop activities that caught the market.	
(3) The follow-up and feedback process of activities was also weak, and there were some unachieved items.	(2) Increase the target achievement ratio by **visualizing the process from PM Monthly PDCA to activity evaluation**

5.1.3 Progress of activities

The progress of activities is shown in Table 5.1.3.1 below. (Only chapter 5.1 is described, chapters 5.2 and after are omitted)

Table. 5.1.3.1 Progress of activities

FY	Up to 2019	2020	2021	2022
Aim	‣To leverage BKC's strengths and overcome its weaknesses.	‣To clarify business objectives and mid-term strategies. ‣To build a system for deploying strategies and policies.	‣To improve the quality of policy management. ‣To clarify the relationship between policies and activities.	‣To strengthen activities to achieve the strategy.

	(1) Improve the level of policy management by building System for developing policy from market information in collaboration with KLTD, APP, BKS			
Major Activities	‣ To understand weaknesses and strengths by **SWOT analysis** ‣ Make common understanding by the annual policy explain meeting	‣ To strengthen policy development by **BKC's Policy Development Management System Chart** ‣ To embody Mid-Term Strategy by ④ **Strategy Review Committee** ‣ Prepare document formats for Policy management	‣To share market information by ② **Meetings with KLTD/APP/BKS.** ‣ To deploy strategy by **Mid-Term Management Plan** ‣ To turn PDCA cycle by **Annual Activities Summary Sheet** ‣ To check the relation by **Policy X-type Matrix**	‣To research the market by ① **Visiting customer sites with Customer Survey Team** ‣ To develop strategies and policies by ③ **Strategy Deployment Table from customer needs** ‣ To review the status of target at Strategy Review Committee
	(2) Increase the target achievement ratio by visualizing the process from PM Monthly PDCA to activity evaluation			
	‣ Review the activity in a half-year activity review meeting	‣ To deploy next action by ⑤**PM Activity Review Sheet.** ‣ To evaluate by ③**PM Diagnosis Evaluation Sheet** ‣ To correctly implement policy management by **PM & DM Manual**	‣ To run PDCA by ① **PM Monthly PDCA Sheet** ‣ To diagnose efficiently by ② **President's Diagnosis Manual**	‣ To visualize activity status by ⑥**PM Monthly PDCA Check List** ‣ Level up departmental activities by **Cross-Diagnosis** ‣ To feedback by ④ **President Diagnosis Result Report**
Effect	BKC's strengths and weaknesses were sorted out and can be developed into strategies.	The basis for policy management has been established.	BKC is now able to develop policies that reflect market information.	Target achievement is improving.
Problem	BKC's mid-term management strategy and policy management system are unclear.	‣Policy has many internal activities. ‣The connection between policy and each activity is weak.	There are still some unachieved items in the activities of each department.	Market information needs to be analyzed in more detail and reflected in policy.

5.1.4 Contents of activities

(1) Improve the level of policy management by building System for developing policy from market information in collaboration with KLTD, APP, BKS

BKC improved **BKC's Policy Management System Chart** in order to develop policies from market information. BKC strengthened the process of developing policy by collecting market information with relevant departments to build System for developing policy from market information. In policy development, BKC visited customer sites together with APP and BKS to collect information, and BKC built a system to collect more detailed information by sharing information through **Meeting with KLTD/APP/BKS** (Customer Information Meetings and Hansei Meetings). Based on that information, BKC analyzed using the Strategy Deployment Table from customer needs and created **Mid-Term Management Plan**. And then **Strategy Review Committee** was established to discuss strategy and policy.

BKC's policy management focuses on the Plan for creating policies, and Strategy Review Committee plays an important role in policy development. This Committee is held every 1Q to review the business situation based on market information and needs and discuss the achievement status of targets.

The annual activity results were reviewed using **Annual Activities Summary Sheet** and improved to consider policies for the next year.

As a result, BKC is now able to collect market information in collaboration with relevant departments and develop policies that reflect the market.
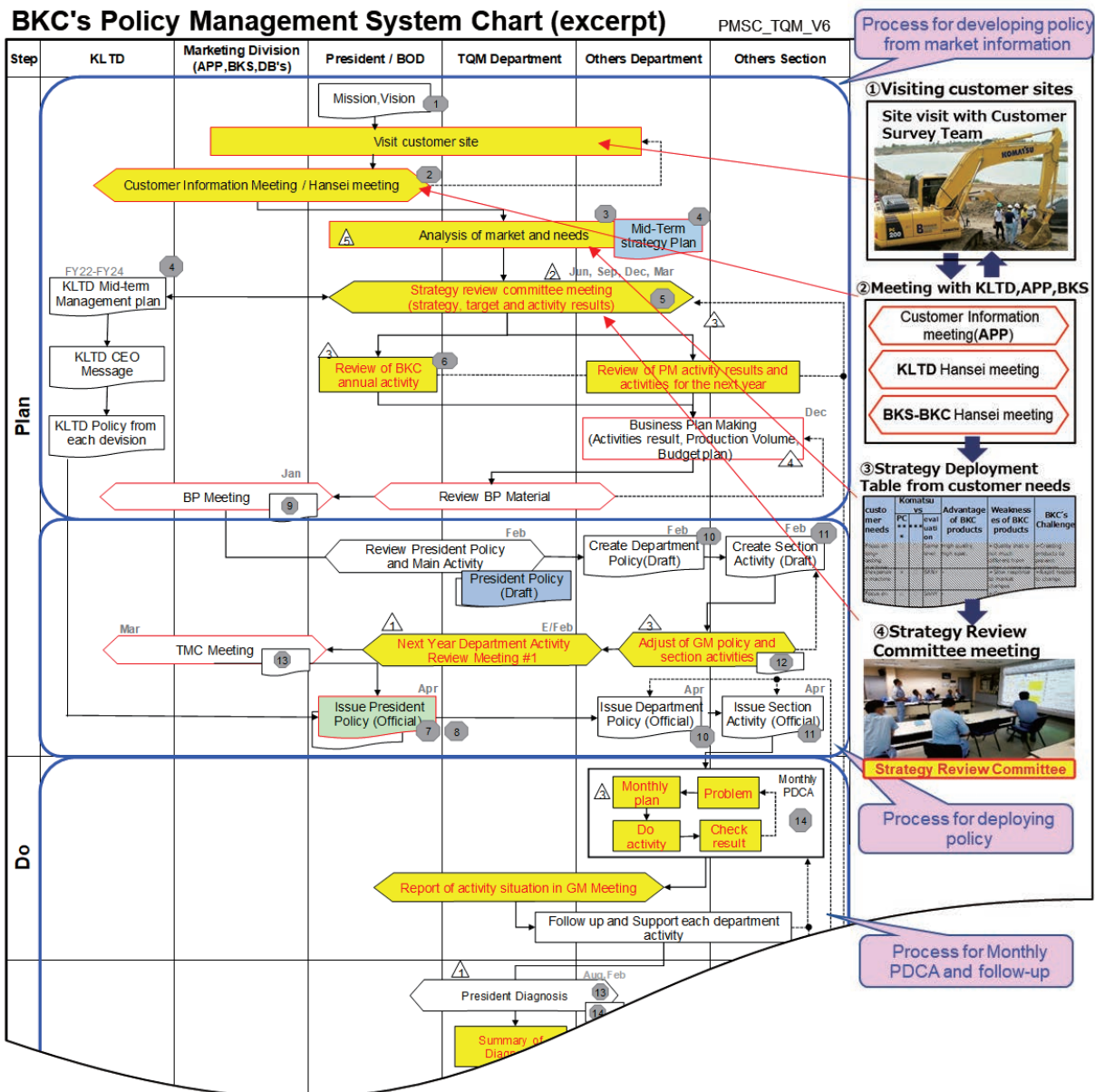
Figure 5.1.4.1 BKC's Policy Management System Chart (excerpt)

(2) Increase the target achievement ratio by visualizing the process from PM Monthly PDCA to activity evaluation

In the policy deployment process, BKC prepared a format for policy management and improved its system for implementing activities under PDCA cycle.

Department activities were practiced using ①**PM Monthly PDCA Sheet**, and the activity status was shared at GM meeting. And then the process evaluation of the activities was evaluated utilizing ②**President's Diagnosis Manual** and ③**PM Diagnosis Evaluation Sheet**. The evaluation results are summarized by ④ **President's Diagnosis Result Report**, and improvements are promoted for level up. Then, in the Half-Year Activity Review, ⑤**PM Activity Review Sheet** is used to reflect on the activity and connect it to the next activity. The activity status of each department has been visualized by ⑥**PM Monthly PDCA checklist** and promoted.

The status of target achievement is reviewed quarterly with **Matrix of target achievement and implementation status**, and the next action is taken.

In this way, BKC has built a system to deploy its policies and has implemented activities to achieve its targets.
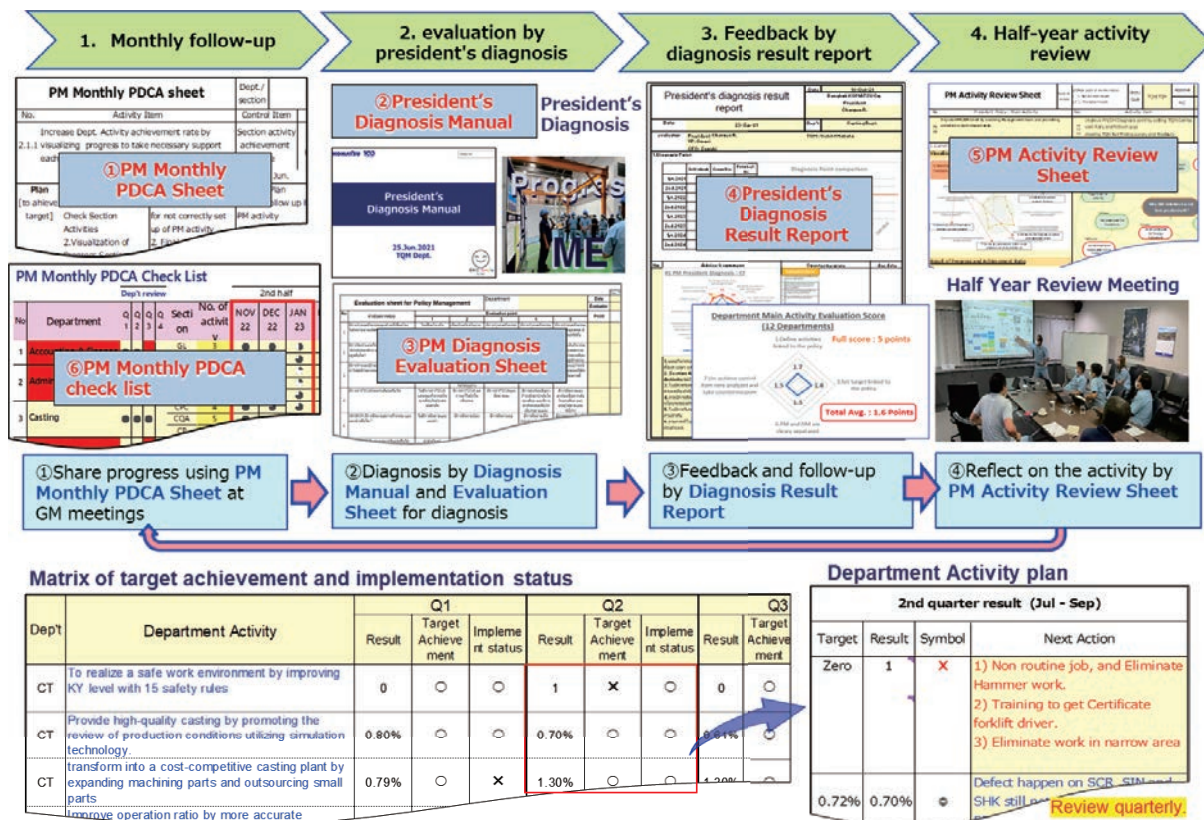
Figure 5.1.4.2 Process from PM Monthly PDCA to Activity Review
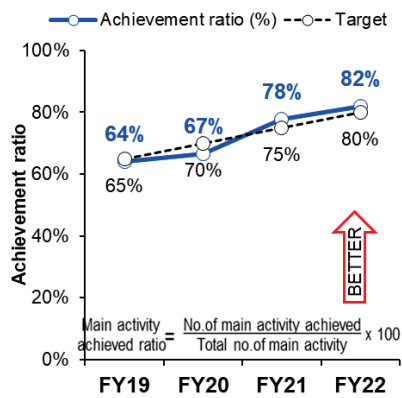
5.1.5 Effects

(1) Tangible effect
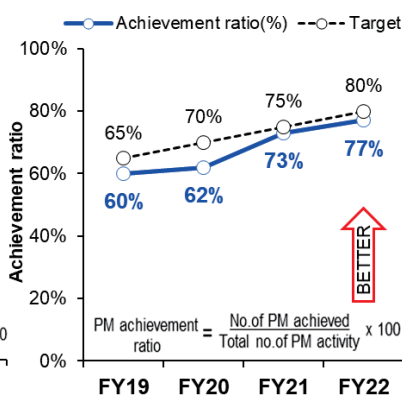

Figure5.1.5.1 Achievement ratio of BKC Main activity
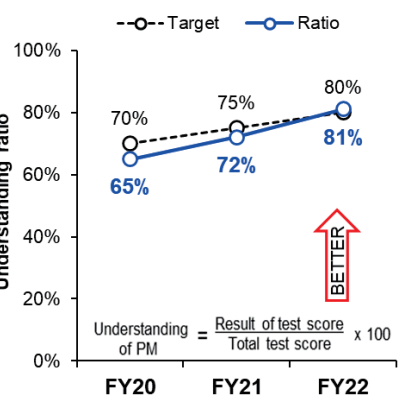
Figure5.1.5.2 Achievement ratio of Dep't activity

Figure5.1.5.3 Understanding of policy management

(2) Intangible effect

1. BKC strengthened its collaboration with Komatsu Group companies through the collection of market and customer information. And BKC can further enhance strategies based on market information and develop its policies.

2. BKC has learned the importance of policy management and is working together as an organization.

5.1.6 Future plan

BKC will build a system to quickly share market information with APP and BKS by utilizing ICT, and further evolve its strategy to achieve business objectives.

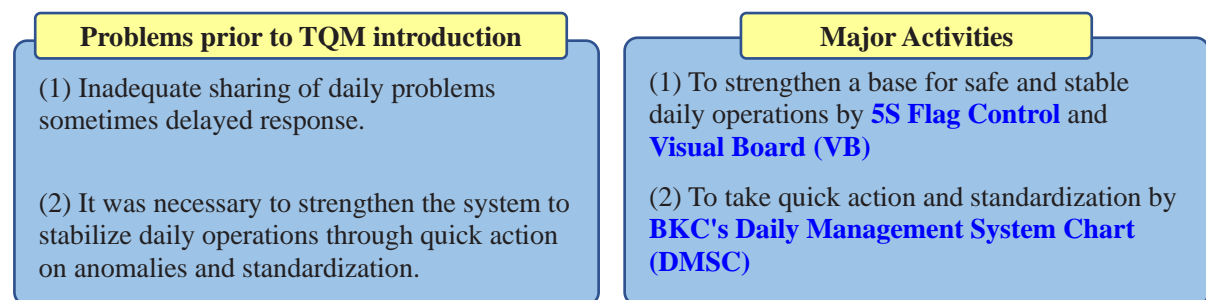## 5.2 Strengthen daily operations through Daily Management
5.2.1 Overview
BKC has maintained and improved its operations based on its basic policy of quality first. And BKC has developed and grown through steady activities. But on daily operations, sharing of problems was lacking, and sometimes action was delayed. The workplace environment is changing daily, and BKC needed to strengthen its system to immediately take action on any abnormalities and stabilize daily operations.
After the introduction of TQM, BKC has returned to the basics, formulated the following three guidelines for workplace operations, and improved its system.

1. Workplace that ensures 5S implementation
2. Workplace to visualize the problem and have a common understanding
3. Workplace that takes quick action on problems and standardizes

BKC established 5S system as the foundation of daily operations and strengthened its system to produce safe and stable products. BKC set up **5S Committee** and established a system to thoroughly promote 5S through **5S Monthly Evaluation** and **5S Flag Control**. And then, BKC visualized the problems on SQDC using **Visual Board (VB)** and created an environment in which all members worked with a common understanding. For quick action on problems and standardization, BKC improved our system to ensure daily management based on **BKC's Daily Management System Chart (DMSC)**.
As a result, BKC's workplace operations have been strengthened and improvements are being made to ensure stable daily operations.

5.2.2 Focus of activities

Problems prior to TQM introduction	**Major Activities**
(1) Inadequate sharing of daily problems sometimes delayed response.	(1) To strengthen a base for safe and stable daily operations by **5S Flag Control** and **Visual Board (VB)**
(2) It was necessary to strengthen the system to stabilize daily operations through quick action on anomalies and standardization.	(2) To take quick action and standardization by **BKC's Daily Management System Chart (DMSC)**

5.2.3 Contents of activities
(1) To strengthen a base for safe and stable daily operations by 5S Flag Control and Visual Board
1) To ensure 5S implementation
BKC has worked on the thorough 5S and safety based on the guideline that "good quality starts from 5S and safety". Since 2019, BKC has set up **5S Committee**, visualized the 5S situation in each area, and each employee has been working to improve 5S. 5S and safety promotion were reflected and reinforced in **BKC's Safety Management System Chart (SMSC)**. the issues on 5S and safety in the workplace can be pointed out anytime and anywhere by **5S APP** and are followed up at Safety Meeting.
In addition, 5S status of each area is managed by **5S Monthly Evaluation**, visualized by **5S Flag Control**, and leading to improve level of 5S.
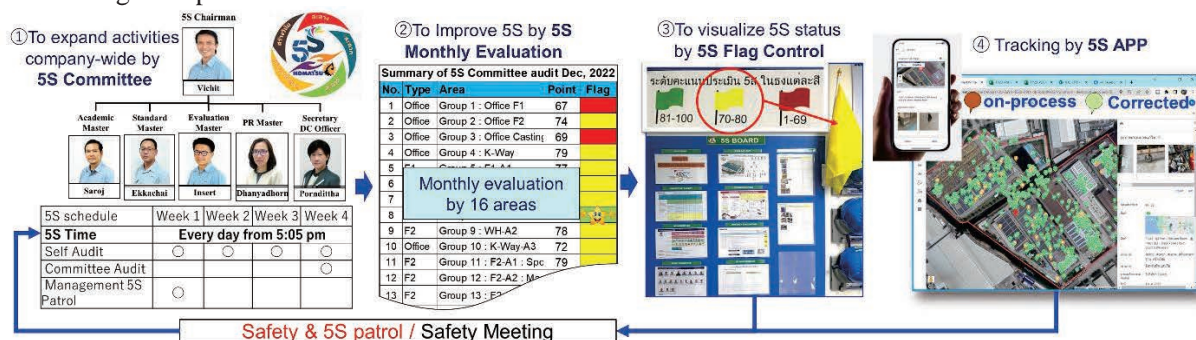

Figure 5.2.3.1 System for 5S promotion

2) To visualize the problem and have a common understanding
BKC has set up a visual board and promotes information sharing in order to have a common understanding with members about workplace issues and activities. **TQM Visualization Board** was set up to align the vectors on the activity situation.

In addition, **SQDC Control Board** is used to share daily problems and take quick action based on a common understanding. At **Zero Accident Meeting** held every morning and afternoon, information is shared using this board, and workers are aware of their roles and perform their daily work.
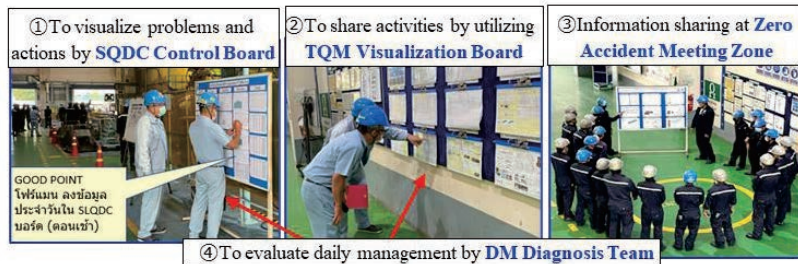

① To visualize problems and actions by **SQDC Control Board**
② To share activities by utilizing **TQM Visualization Board**
③ Information sharing at **Zero Accident Meeting Zone**
④ To evaluate daily management by **DM Diagnosis Team**

Figure 5.2.3.2 Share information with members by Visual Board

(2) To take quick action and standardization by BKC's Daily Management System Chart (DMSC)

BKC built **BKC's Daily Management System Chart (DMSC)** to take quick action through information visualization, and maintained and improved its operation. BKC has clarified the work role and control items by **Function Sheet for Daily Management** and strengthened the flow from anomaly detection to standardization. If anomalies are found, take measures and standardize using **DM Measures Record Sheet**. When a problem occurred for three consecutive months, **A3 QC Story Sheet** was used to solve the problem, and the system to standardize was strengthened. In addition, in order to solve problems quickly, BKC has set **Cross-function Room** and works together with related departments to solve problems.

As a result, employees are more sensitive to problems, respond quickly, and are being made improvements to stabilize processes.
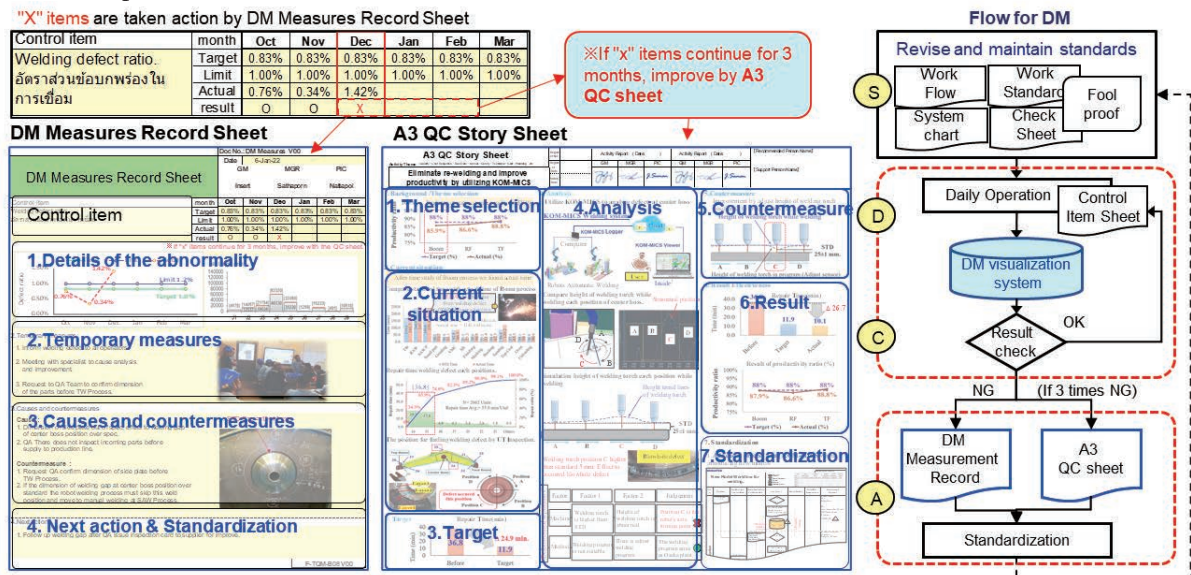

Figure 5.2.3.3 Flow from anomaly detection to standardization

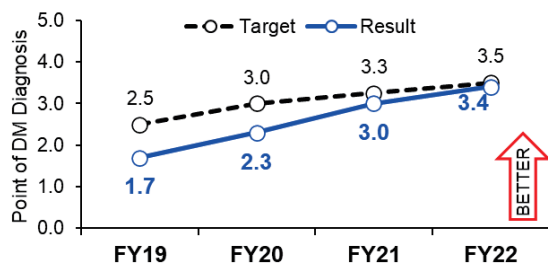**5.2.4 Effects**

(1) Tangible effect
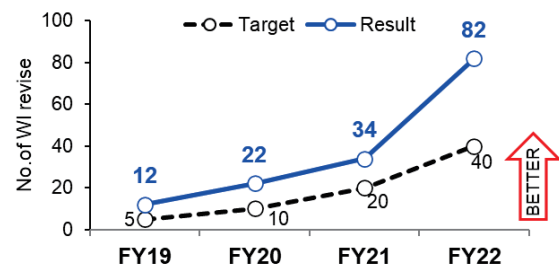

Figure 5.2.4.1 Point of DM Diagnosis

Figure 5.2.4.2 Number of Work Instruction revised

(2) Intangible effect

Employees now recognize their roles, perform their daily work, and act more agilely on issues.

5.2.5 Future plan

BKC builds a system to quickly share daily problems by utilizing ICT, and further improve the management level of each department.

5.3 Quality Assurance System that produces global high quality
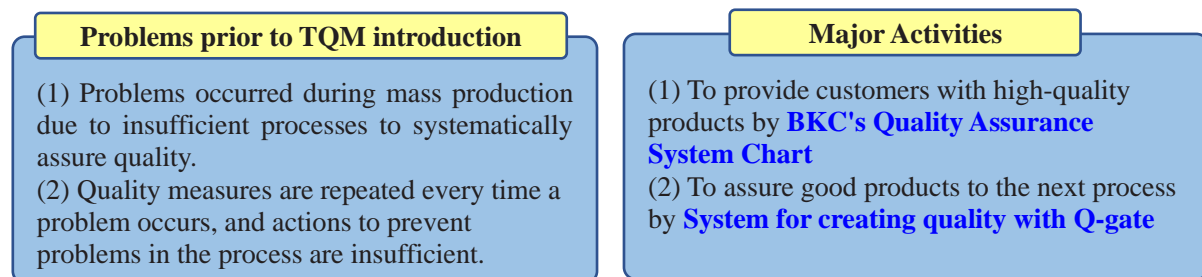
5.3.1 Overview

As a cross-source factory, BKC has expanded production models and provided high-quality products globally. Currently, cross-source models are expanding. BKC needed to further strengthen its quality and assure stable high quality globally.

BKC had been developing our activities under the slogan "To achieve global high quality" even before the introduction of TQM. At that time, each department made efforts to conduct individual quality improvement activities. However, the links between the activities of each department were weak, and sometimes quality problems occurred in the next process. BKC needed to strengthen quality creation in each process by connecting all department quality activities from the production preparation stage to customers.

After the introduction of TQM, BKC organized the flow from the mass production preparation to after shipping and built a new **Quality Assurance System Chart (QASC)**. BKC set up a review process at each step, from the new model introduction to the customer process, and improved the system to send good products to the next process. And BKC improved the system to assure its process to our customers.

As a result, BKC built a consistent assurance system from suppliers to customers, and a system that produces global high-quality was strengthened. BKC develops daily activities to ensure each process of QASC.

5.3.2 Focus of activities

Problems prior to TQM introduction	**Major Activities**
(1) Problems occurred during mass production due to insufficient processes to systematically assure quality. (2) Quality measures are repeated every time a problem occurs, and actions to prevent problems in the process are insufficient.	(1) To provide customers with high-quality products by **BKC's Quality Assurance System Chart** (2) To assure good products to the next process by **System for creating quality with Q-gate**

5.3.3 Contents of activities

(1) To provide customers with high-quality products by BKC's Quality Assurance System Chart

BKC has been working to provide Global High Quality (Same quality as mother factory) even before the introduction of TQM. However, BKC's quality assurance system chart was based on QMS, and was not enough as a process to create global high quality.

Therefore, BKC strengthened QASC to create quality in the previous process and prevent problems in the next process. BKC's QASC is divided into 4 steps, and in each step, the review process to take the next step is set and evaluated. In the mass production preparation step, BKC checks the preparation status using **Production Preparation Check Sheet**, and during the mass production trial, holds **Appearance Evaluation Meeting** with the mother plant and decides on the start of mass production using **Shipping Judgment Form**. Then, any manufacturing or drawing problems feedback to KLTD, and BKC has a system to follow up until the drawing is changed. During mass production, quality information is quickly sent to Q-gate using **Quick Feedback Sheet** to create quality. In addition, BKC has launched **Customer Survey Team**, promoted activities to prevent problems at customer sites, and strengthened its system to collaborate with KLTD and APP. These processes are reflected in BKC's QASC, maintained and improved.

As a result, BKC's claim rate is kept lower than that of the mother plant, leading to customer satisfaction.
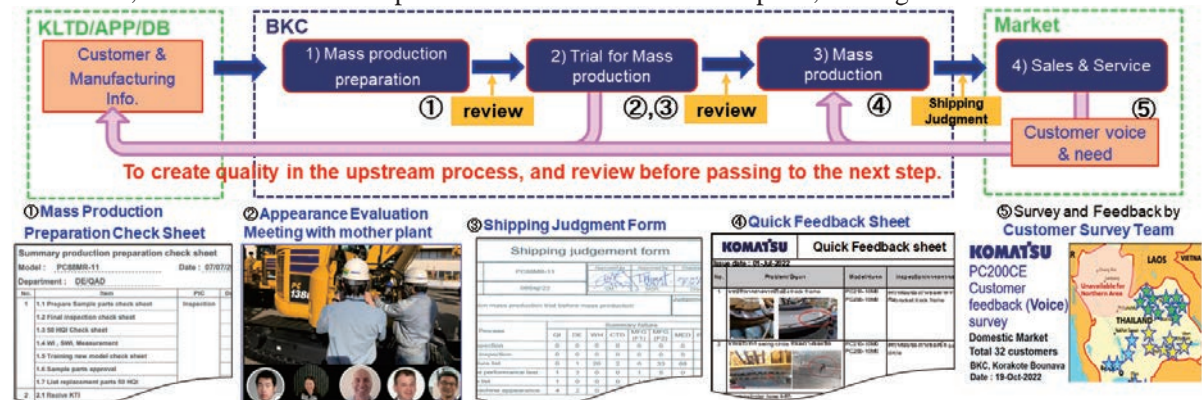

Figure 5.3.3.1 Improvement point of QASC

(2) To assure good products to the next process by System for creating quality with Q-gate

BKC has set up Quality Gate (QG) in the manufacturing process and voluntarily assured quality in the process. However, its function was to find defects in the process in advance and prevent them from outflowing to the next process. As the production line becomes more multi-model, BKC needed to strengthen quality creation in the process in order to send good products to the next process without relying on checks.

After the introduction of TQM, BKC enhanced the system to create quality in the process by utilizing QG. **Quality Police (QP)** was assigned to guide the standard work based on the WI and train the workers. Then, worker skills were visualized using **Skill Map**, and work processes were managed according to their skills. Defect information for each QG was visualized by **Quality Problem Record by Quality Gate** to strengthen quality creation at the previous process. Quality information is quickly shared between QP, QG, and QA using **Quick Feedback Sheet** and countermeasures were taken in the process. In addition, the equipment is controlled by a self-maintenance sheet, and tightening tools are controlled for **torque by Control Chart**. BKC has improved to complete its own process while utilizing Q-Gate and workers are responsible for their own processes and are working to prevent problems.

Figure 5.3.3.2 Quality creation with Quality Gate (Q-gate)

5.3.4 Effects

(1) Tangible effect

Figure 5.3.4.1 Claim ratio (compare mother plant)

Figure 5.3.4.2 In-house final defect ratio

(2) Intangible effect

The assurance process for customers is now clearly visualized, and BKC is confident in its quality assurance system to produce global high quality.

5.3.5 Future plan

BKC will build a process to proactively absorb quality information from KLTD and create quality with feedback to development.

6. Practice of Challenging Activities
6.1 Development of value-added products that meet regional needs
6.1.1 Overview

New models are developed by KLTD, manufactured by BKC, and sold to customers from Distributor (DB). BKC cannot develop the base machine on its own, but BKC can respond to customer needs by developing and providing new Attachments and Options (ATT/OPT) based on regional needs.

BKC's role is not only to manufacture the models developed at KLTD. What is required of BKC is to understand customer requirements in Southeast Asia, provide

Figure 6.1.1.1 Development flow to meet region needs

accurate solutions, and become an indispensable presence for customers.

In recent years, medium-sized hydraulic excavators in Southeast Asia have become increasingly commoditized with competing machines, and BKC needed to make its products more competitive by producing value-added products that meet customer needs.

Therefore, BKC has built **Customer Feedback Connecting System**, quickly identified regional needs, and strengthened its activities to develop products.

6.1.2 Focus of activities

Problems prior to TQM introduction
(1) BKC was unable to fully grasp customer needs, and some products were unable to meet customer needs.
(2) Due to limited development resources, there were only a few types of products that could be developed, and development lead times were long.

Major Activities
(1) To provide products that meet customer needs by building **Customer Feedback Connecting System**
(2) To shorten development L/T by **Multi-Sourcing Development Resources**

6.1.3 Contents of activities
(1) To provide products that meet customer needs by building Customer Feedback Connecting System

Until now, BKC has developed new ATT/OPTs based on information from the DB, but BKC needed to strengthen its systematic approach to proactively identify and materialize customer needs.

Therefore, BKC set up **Customer Survey Team** to gain a deeper understanding of customer information. And then, BKC built **Customer Feedback Connecting System** to discuss customer needs in depth with relevant departments based on the results of the customer survey and lead to better products. After collecting customer feedback, BKC shared and discussed them in **Customer Information Meetings (CIM)** conducted jointly with Asia Product Planning (APP) to identify the true needs of our customers. Figure 6.1.3.1 shows an example of the flow and utilization of CIM.

BKC conducts a customer visit survey together with Distributors and APP to specifically understand requests for improvement. BKC then shares improvement proposals based on the survey in CIM for further discussion. During the development process, suggestions for productivity and cost improvement are also made, and further discussions are continued in CIM, including the side effects of design changes, before proceeding to quality checks. Through these processes, the initial idea is brushed up before mass production, and a better solution is provided to the customer.
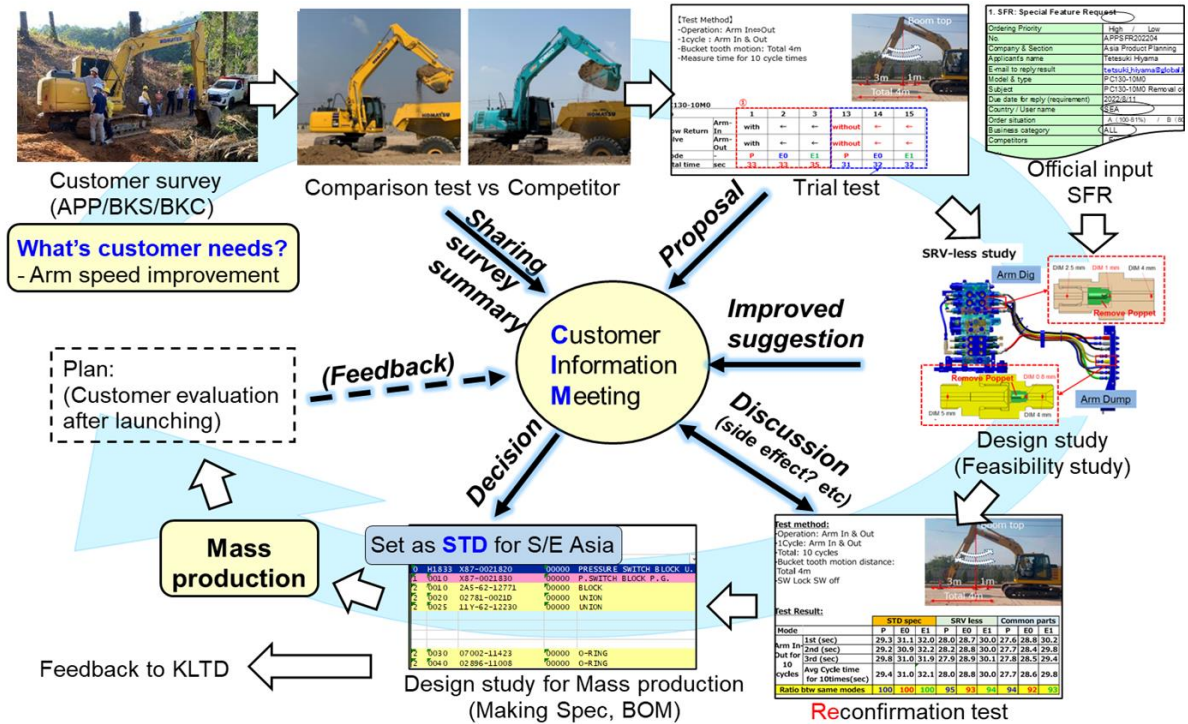
Figure 6.1.3.1 How to utilize Customer Information Meeting

(2) To shorten development L/T by Multi-Sourcing Development Resources

A challenge in the process of realizing customer needs is that customers require specifications that have never been developed before. BKC's development resources are limited, and development lead times are sometimes long in order to meet customer needs.

Therefore, in order to respond quickly to customer needs, BKC built a development system through Multi-Sourcing Development Resources, utilizing ADC (Asia Development Center) and 3rd Party. Figure 6.1.3.3 shows an example of BKC developing **PC210 Amphibious (AMP) spec** in cooperation with a third party (EIK). By collaborating with EIK, BKC was able to develop a specification that met the customer's needs in a short L/T of 3 months. In addition to this, BKC has flexibly responded to customer needs by developing **Special Bucket** and **Super Long Front** work equipment utilizing 3rd Party.

In collaboration with KLTD, BKC also mass-produced a cylinder with a new structure called **Oil Passage Integrated cylinder (OPI)** and introduced specifications suitable for the customer site. These development processes are incorporated into **Customer Feedback Connecting System Chart**, and BKC has expanded its development resources and established a system that can quickly respond to regional needs.

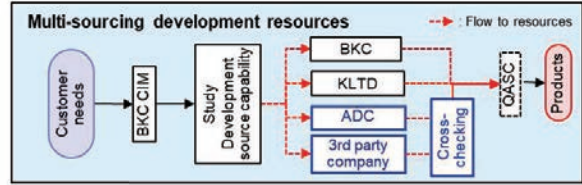Figure 6.1.3.2 Examples of development based on regional needs
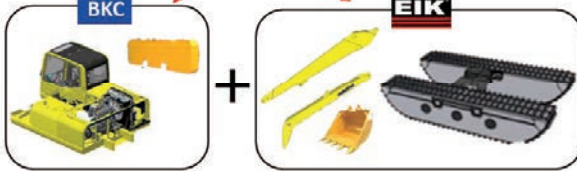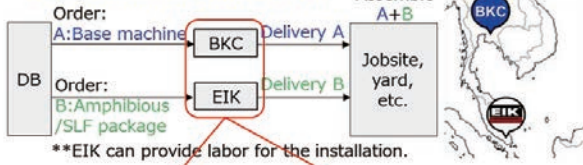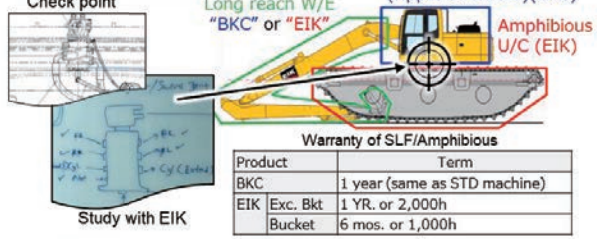
Figure 6.1.3.3 To produce PC210-10M0 Amphibious (AMP) spec by utilizing 3rd party (EIK)
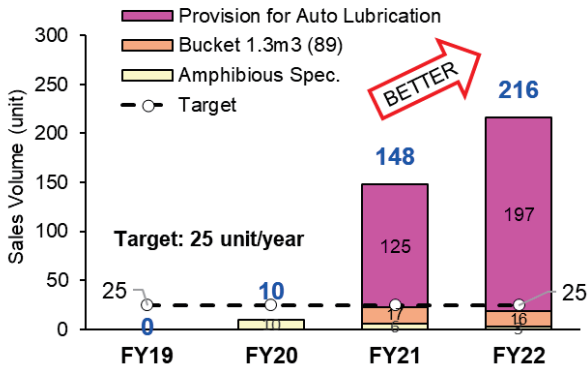
6.1.4 Effects

(1) Tangible effect

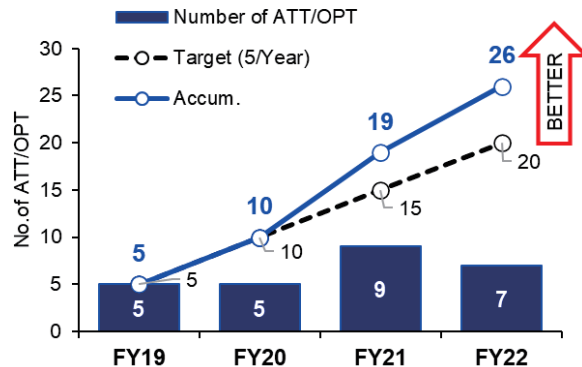Figure 6.1.4.1 Sales Volume of New Spec/OPT

Figure 6.1.4.2 Number of New ATT/OPT (20t class)

(2) Intangible effect

1. BKC is able to strengthen its relationship with APP and BKS and discuss more deeply to materialize customer needs.

2. BKC was able to gain a deeper understanding of how its products are used in the actual customer's site through customer survey activity.

6.1.5 Future plan

BKC will add Working Gear function to our Design Engineering to enhance its development capabilities and strengthen the strategy of responding to customer needs.

6.2 Rapidly launch and supply the machines that market demands

6.2.1 Overview
As a cross-sourced factory, BKC has a mission to meet global demand not only in Thailand. BKC's key role is to quickly provide the machines that the market requires.

In the Southeast Asian market, Komatsu had significantly lost market share due to the rapid increase of competitors, especially in the mainstay HE20T, and the shift in customer base from premium models to economy models. Therefore, BKC needed to quickly launch a new model that could meet the needs of the economy segment. In the global market, BKC, which can produce Tier 4 model, needed to expand cross-sourcing to meet global demand.

6.2.2 Focus of activities

Problems prior to TQM introduction	Major Activities
(1) In the Southeast Asian market, competitors, especially in HE20T, have grown dramatically.	(1) To quickly launch the most optimal machines for Southeast Asia by **2-Lineup Strategy**
(2) Global Komatsu supply was insufficient in comparison with the demand.	(2) To meet global demand by **System for Quickly Cross-Sourcing**

6.2.3 Contents of activities
(1) To quickly launch the most optimal machines for Southeast Asia by 2-Lineup Strategy
BKC launched the PC200-10M0 (CE) based on KLTD's 2-lineup strategy in a historically short lead time to enable customers to select the optimal model for their needs and introduced it to the market for general civil engineering customers (CE customers). BKC has built **System to launch new models in a short lead time** and contributed to expanding its market share in Southeast Asia. (Details of activities are omitted)

(2) To meet global demand by System for Quickly Cross-Sourcing
BKC is one of the Komatsu Group companies that can supply Tier 4 model. Leveraging this strength, BKC has strengthened its efforts to catch market demand to meet global demand. BKC established **System for Quickly Cross-Sourcing** through four types of Hansei Meetings for each region and captured demand and expanded production.
As a result, BKC's production models have increased, and production volume has expanded. Therefore, in order to improve the efficiency of the production line, BKC has formulated **New Line Expansion Plan** and is now constructing a new assembly line to start operations in 2023. (Details of activities are omitted)

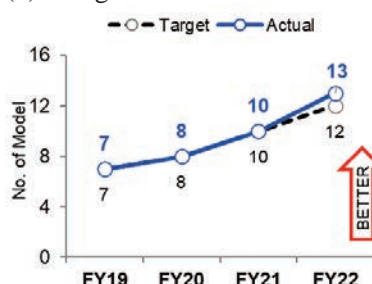### 6.2.4 Effects
(1) Tangible effect
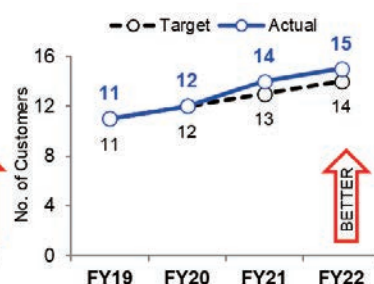

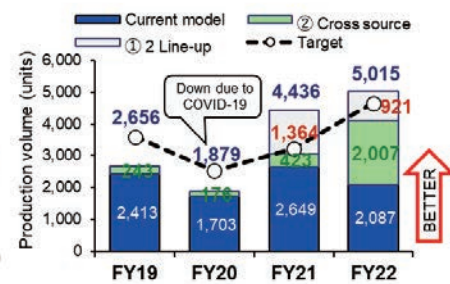Figure 6.2.4.1 Number of model   Figure 6.2.4.2 Number of Customers(DB)   Figure 6.2.4.3 Production Volume

(2) Intangible effect
1. The quick introduction of new models to the market has expanded sales strategies and was appreciated by sales companies.
2. BKC became the first priority cross-source factory in Global Komatsu.

6.2.5 Future plans
BKC will reinforce its production capacity by launching New Line to meet global demand.

6.3 Expand global procurement by localization (Omitted)

In order to improve our global competitiveness, BKC had strategically promoted cost reduction activities through localization and globally deployed competitive parts with stable quality. BKC strengthened cooperation with suppliers and established a system to reduce costs while ensuring quality. Then, BKC has expanded its localization and expanded its parts supply globally. (Details of activities are omitted)

6.4 Reform Casting Business with new value-added products

6.4.1 Overview

The casting business in Thailand was established in 1989 as Bangkok Komatsu Industry (BKI) and had production activities in the BKC area. However, due to the reorganization of production, in 2010 and 2013, the small and medium product line (F1 and F2) was closed and consolidated into the F2 line. Furthermore, in 2014, BKI was merged with BKC in order to create synergies and improve efficiency. The casting business has a structure that makes it difficult to generate profits, and BKC needed to operate the casting business more efficiently and transform it into a competitive casting plant that could support BKC's business.
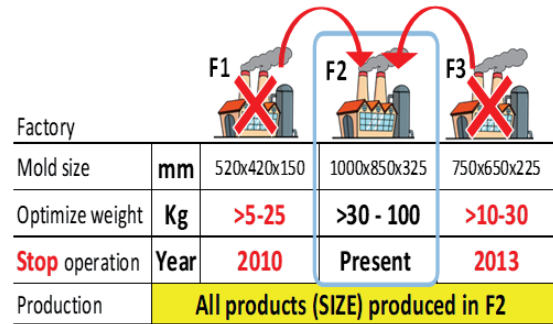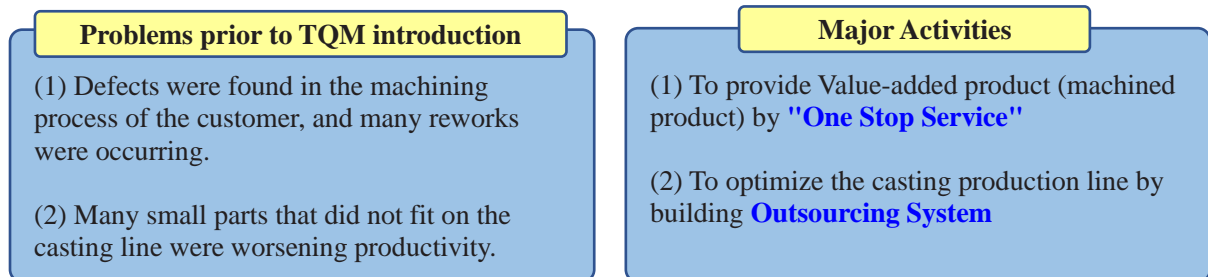

Figure 6.4.1.1 History of Casting Plant

The casting business has produced various castings to meet customer needs. However, when defects were discovered in the customer's processing process, rework occurred, confusing production. In addition, BKC was producing many small parts that were not suitable for casting lines, reducing productivity.

Therefore, BKC strategically implemented activities to optimize the casting production line and provide value-added products. BKC improved the quality of its castings by transferring machining for casting to Thailand and providing **One Stop Service** from casting to finished assembly. And then, BKC built **Outsourcing System** for small parts and worked with suppliers to provide value-added castings, and reformed a new business model for casting.

Through these activities, BKC built a consistent quality assurance system from suppliers to customers and improved its system to provide new value-added products to customers. As a result, productivity and quality in the casting business have improved, and the profit structure of the casting business has improved.

6.4.2 Focus of activities

Problems prior to TQM introduction
(1) Defects were found in the machining process of the customer, and many reworks were occurring. (2) Many small parts that did not fit on the casting line were worsening productivity.

Major Activities
(1) To provide Value-added product (machined product) by **"One Stop Service"** (2) To optimize the casting production line by building **Outsourcing System**

6.4.3 Contents of activities

(1) To provide Value-added product (machined product) by "One Stop Service"

Cast parts shipped from BKC are machined at the customer's site and assembled into finished products. However, some defects were found during machining at the customer's site, which affected the customer's production.

Therefore, BKC implemented a strategy to transfer the machining process to Thailand in order to prevent problems at the customer's site.

In order to incorporate machining products, BKC studied machining know-how from the machine department of BKC and acquired machining technology. In order to enhance the quality assurance of machining products, BKC checked the supplier's quality by ①**Quality Document Issue**. And BKC used ②**New Item Preparation Summary Sheet** to evaluate the adequacy of production and make the decision to launch new parts. In addition, BKC adopted ③**5 Lots Inspection method** to confirm initial quality and established a system to assure quality with **One Stop Service** from casting to machining.
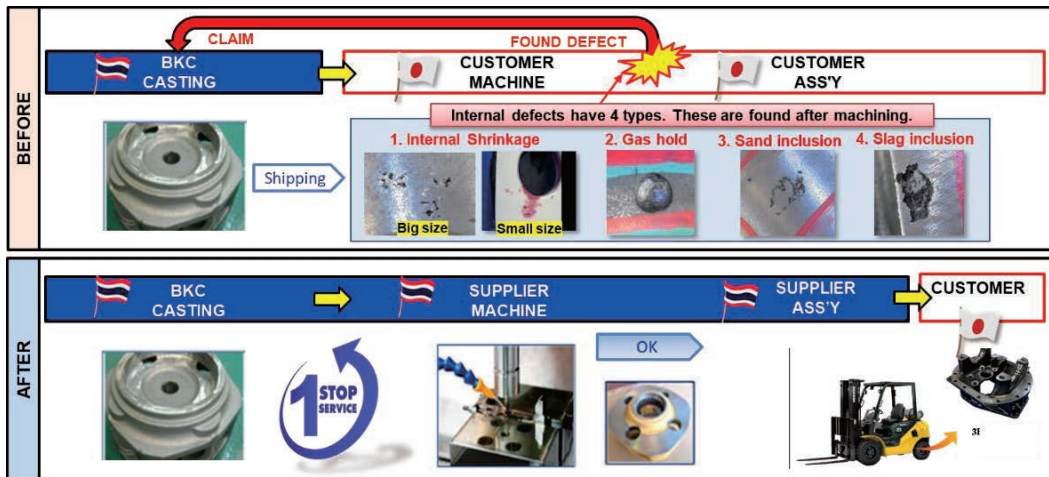
Figure 6.4.3.1 Value-added product (machined product) by "One Stop Service"

(2) To optimize the casting production line by building Outsourcing System

BKC's casting line was suitable for producing castings weighing over 30 kg. Small parts weighing 30 kg or less had a lower yield rate, which was a factor in deteriorating productivity.

Therefore, BKC built **Outsourcing System** to perform production suitable for the casting line and selected the most suitable production line from the weight and shape. When launching new parts, BKC evaluated internal and external production by ④**New Item Information Sheet** and decided on the production line. In addition, in order to reduce casting defects, BKC has evaluated the mold design using ⑤**JS-Cast Simulation Sheet** and expanded it to suppliers to support quality evaluation. BKC reflects these processes into Casting's Quality Assurance System to ensure the quality of outsourcing parts.
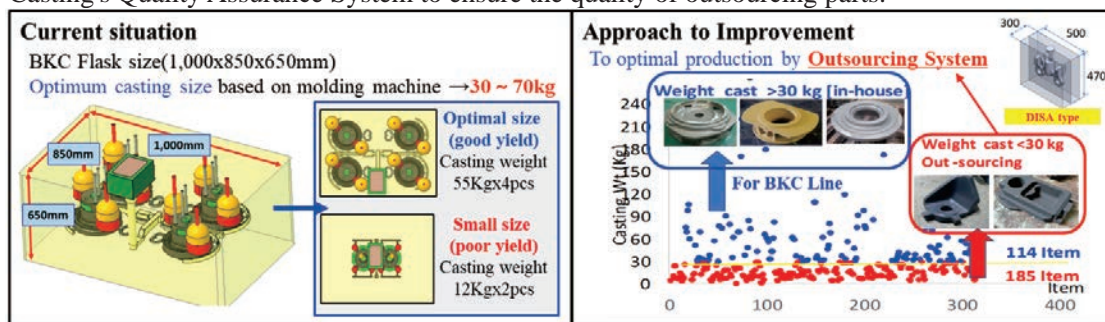

Figure 6.4.3.2 Outsourcing of small casting to optimize production line

6.4.4 Effects

(1) Tangible effect
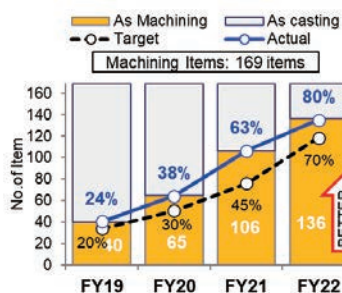
Figure 6.4.4.1 Expansion of machining parts   Figure 6.4.4.2 Increase outsourcing parts   Figure 6.4.4.3 Customer claim ratio
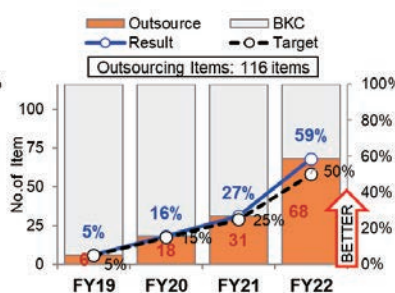
(2) Intangible effect

1. One-Stop Service from casting to machining has received high praise from customers.
2. BKC was able to contribute to the improvement of casting technology in Thailand through technical support to suppliers.

6.4.5 Future plan

BKC will make improvements to stabilize production and reduce energy consumption based on the equipment renewal plan for the casting line.

6.5 Create new value with partners through ICT
6.5.1 Overview
BKC has a specialized department for ICT development to efficiently perform operations and respond to advanced information technology and is actively developing ICT. So far, BKC has developed many ICT systems in-house and has operated efficiently with partners (BKC In-House, Supplier, Customer) as tools to support business. ICT development has proceeded based on requests from users, but ma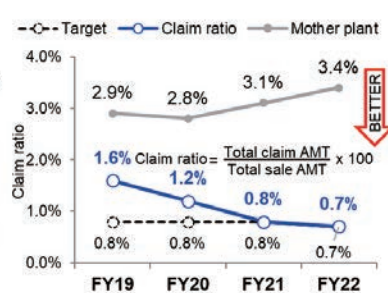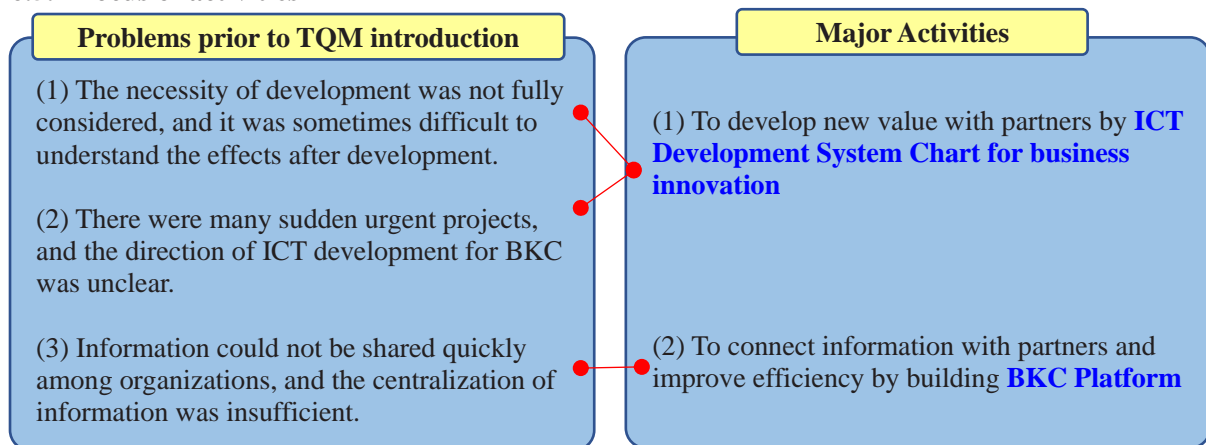ny projects pursued only convenience, and the direction of ICT development for BKC was unclear. BKC needed to focus on development to innovate its business by fully utilizing ICT in an accelerating digital society.

Therefore, BKC improved **ICT Development System Chart** and strengthened its system to develop based on **ICT Development Basic Policy** in order to create new value with partners through ICT. Then BKC promoted the centralization of information to improve information communication with partners and built a base to innovate business while improving operational efficiency. BKC's systems have been centralized on **BKC platform**, and can share information on the same database with partners, from suppliers to customers. As a result, information sharing with partners has progressed and BKC is able to utilize ICT to create new value while increasing efficiency.

6.5.2 Focus of activities

Problems prior to TQM introduction	**Major Activities**
(1) The necessity of development was not fully considered, and it was sometimes difficult to understand the effects after development.	(1) To develop new value with partners by **ICT Development System Chart for business innovation**
(2) There were many sudden urgent projects, and the direction of ICT development for BKC was unclear.	
(3) Information could not be shared quickly among organizations, and the centralization of information was insufficient.	(2) To connect information with partners and improve efficiency by building **BKC Platform**

6.5.3 Contents of activities
(1) To develop new value with partners by ICT Development System Chart for business innovation.
In order to strengthen ICT development for business innovation, BKC formulated ①**ICT Development Basic Policy** and improved the system to develop based on that policy. BKC formulated ②**ICT Mid-term Plan**, clarified development projects for each year, and promoted development to create new value with partners. ③**Project Proposal Sheet** was prepared to review the effectiveness of a development project, and the proponent used it to appeal the necessity of development. Then the priority of development was evaluated using ④**Evaluation Priority Table**, and a development plan was created. In addition, in order to promote speedy innovation in an accelerating digital society, BKC has strengthened ICT training program and has also incorporated **DX basic training**.
In this way, BKC has strengthened ICT development system for business innovation and promoted development to create new value.

(2) To connect information with partners and improve efficiency by building BKC Platform.
BKC took the following steps to centralize information and share information efficiently among partners in order to strengthen the base for business innovation.
  Step1: ICT Development to improve communication between partners
  Step2: Centralize information with a centralized database
  Step3: Create new value through the application for sharing
Figure 6.5.3.1 shows an example of improved information sharing with partners by centralizing and connecting information. The system of BKC was centralized in **BKC Platform** and it has also been improved so that it can be shared between partners on a single database.
Through these steps, BKC connects information from suppliers to customers, creates new value through ICT, and leads to business innovation.
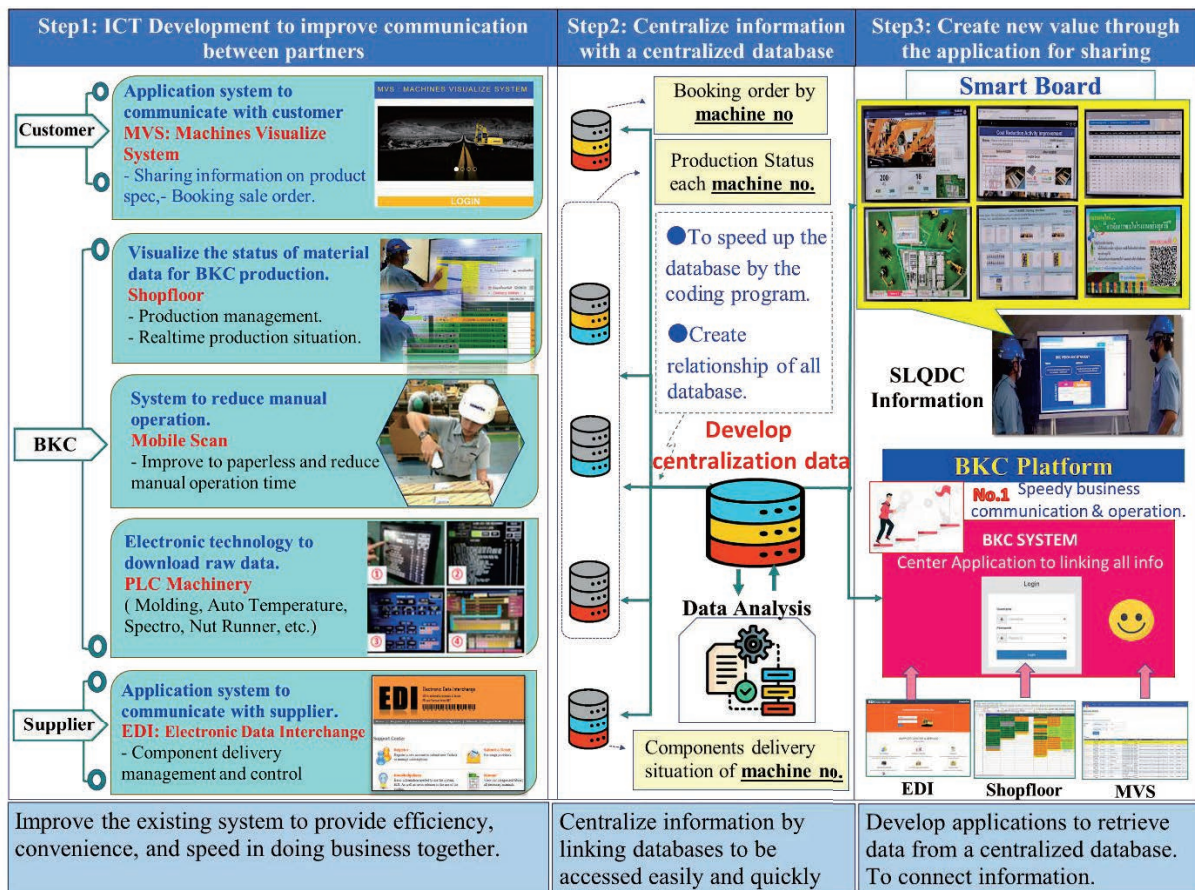
Figure 6.5.3.1 Connect information with partners by centralizing information

6.5.4 Effects

(1) Tangible effect
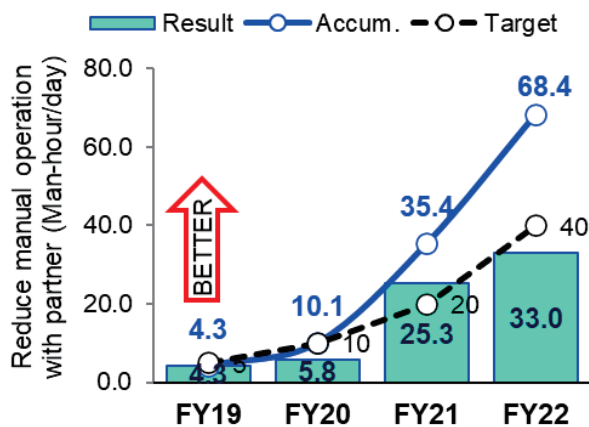
Figure 6.5.4.1 Reduce manual operation with partners
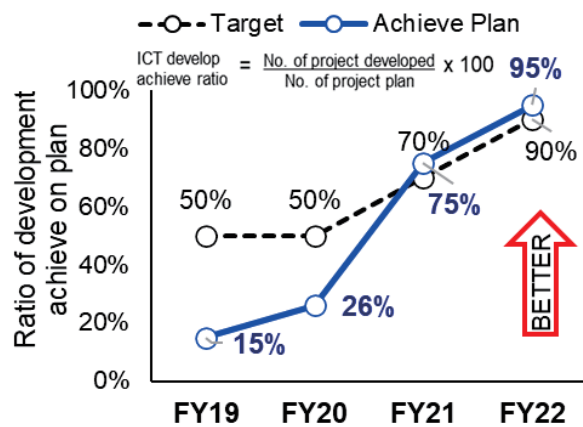
Figure 6.5.4.2 ICT development achievement ratio

(2) Intangible effect
1. BKC views ICT as a tool for business innovation and is now able to utilize ICT to create new value with partners.
2. Suppliers and customers use the system developed by BKC and are satisfied(praised) with the performance.

6.5.5 Future plan

BKC provides timely visibility into the supplier's production status (Real-time WIP, Finished, Packing, and Delivery). BKC also improves its approach to customers by capturing end-user information.

6.6 Human Resource Development to achieve BKC's Strategies
6.6.1 Overview
Employees are a valuable resource for BKC, and employees are essential to support our business as important business partners. In order to enhance their abilities, BKC conducted various training based on the needs of each department. However, the relationship between the abilities required for employees and the necessary training was unclear, and the direction of how to develop the human resources needed for BKC was not defined. In order for BKC to implement its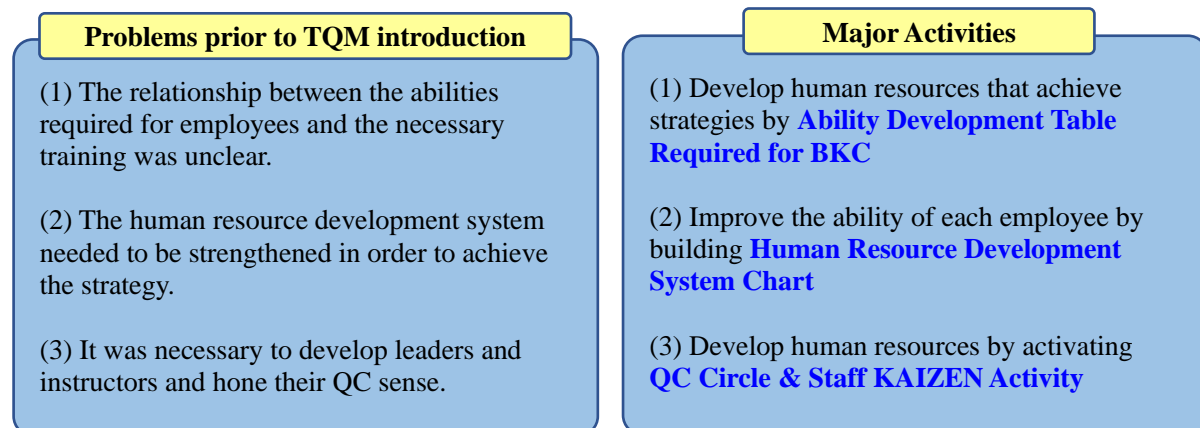 strategy based on its business objectives, it was necessary to link the strategy with the human resources needed for BKC, and to strengthen the system to enable each employee to demonstrate their abilities.

Therefore, BKC organized the abilities required of employees in order to achieve the strategy by **"Ability Development Table Required for BKC"** and developed training programs to strengthen those abilities. BKC created **BKC Training Matrix** by position/function, and strengthened its system for systematically developing human resources through **Human Resource Development System Chart**. BKC has utilized these tools to implement Human Resource Development to achieve BKC's Strategies. In addition, In order to develop human resources through daily improvement activities, BKC enhanced QC training and built a support system by instructors. And BKC revitalized QCC activities to develop human resources.
As a result, BKC has identified the abilities required of employees and has practiced human resource development to achieve business objectives.

6.6.2 Focus of activities

Problems prior to TQM introduction	**Major Activities**
(1) The relationship between the abilities required for employees and the necessary training was unclear.	(1) Develop human resources that achieve strategies by **Ability Development Table Required for BKC**
(2) The human resource development system needed to be strengthened in order to achieve the strategy.	(2) Improve the ability of each employee by building **Human Resource Development System Chart**
(3) It was necessary to develop leaders and instructors and hone their QC sense.	(3) Develop human resources by activating **QC Circle & Staff KAIZEN Activity**

6.6.3 Contents of activities
(1) Develop human resources that achieve strategies by Ability Development Table Required for BKC
BKC defined the organizational abilities required for BKC in implementing strategies from business objectives, and created **"Ability Development Table Required for BKC"**. In order to enhance that ability, ①**Abilities required for employees** were broken down, and ②**Gap from the current situation (weak point)** was analyzed. And then, BKC identified ③**Training Needs to improve Gap**. Based on the training needs, BKC clarified ④**Training program for each position** and visualized the BKC training system by **"BKC Training Matrix by position/function"**.
These tools are regularly reviewed to ensure the required abilities for BKC, and BKC has developed training that should be enhanced to achieve the strategy.
As a result, BKC was able to arrange the training required for employees and BKC's training system was strengthen.

(2) Improve the ability of each employee by building Human Resource Development System Chart
BKC established **BKC's Human Resource Development System Chart** in order to ensure PDCA for training based on BKC Training. And then, BKC strengthened its training system by improving processes from training planning to post-training evaluation methods and the next training content.
BKC managed training information by utilizing ICT and improved to enhance the next training with **Annual HRD Summary Report**.
As a result, BKC is able to enhance its training to achieve its strategy and develop to acquire the necessary abilities.

Table 6.6.3.1 Ability Development Table Required for BKC (excerpt)

Mid-term Strategy	Required Organizational Ability for BKC	① Abilities required for employees	② Gap from the current situation (weak point)	③ Training Needs to improve Gap	Position	④ Training program for each position
1. Pursuit and realization of global high quality for customer satisfaction	Ability to analyze the needs of Southeast Asia and develop special specification products	Product knowledge and ability to provide technical support	Lack of technical support knowledge at the customer's site	Product knowledge (Functions, hydraulics and electrical mechanics) - Develop by **One Komatsu Project** ◢4	◎ ◎ ◎ ◎ (Engineer, Staff, Leader, Worker)	**F5: Engineer Development Program**
2. Strengthen the system to respond to rapid changes.		Ability to utilize QFD, KFTA, FMEA, Matrix Diagram, Reliability design, Design engineering, KES	Ability to utilize QFD, FMEA, Matrix Diagram, Reliability design,	**- Training to utilize QFD, FMEA, Matrix Diagram, Reliability design,)** ◢4	◎ ◎ ◎ ◎	
3. Manufacturing and strengthening competitiveness through collaboration with partners	Ability to provide quickly to global demand and expand cross-sourcing	- Ability to analyze market demand and make production plans - Ability to collaborate with	- Lack of utilization of big data from global demand.	- Utilization technology for **Komtrax Data Analysis, Power BI, AI** ◢1	◎ ◎ ◎ ◎	**F2: ICT Training Program**
		Ability to improve for flexible production	- Need to strengthen production technology capabilities with new	Courses to develop production engineers	◎ ◎ ◎ ◎	F5: Engineer Development Program
4. Fostering human resources to be professional beneficial to customers.		Ability of newcomers to work as a force	Developing a new worker takes time	**A course for newcomers to learn basic skills quickly** ◢1	◎	**O3: Training program for New employees**
	Ability to expand parts globally with local suppliers	The ability to develop the supplier's QDC to be competitive.	- Ability to improve cost reduction based on engineering techniques still	**- IE techniques - VA/VE techniques - Value Stream** ◢2	◎ ◎ ◎ ◎ ◎	**F6: Productivity Improvement Program**
		The ability to reduce production costs of suppliers.		**- SVC, SVM structure** ◢2	◎ ◎ ◎ ◎ ◎	**F8 Accounting Training Program**
		Ability to advise suppliers and drive improvement.	Few people give technical guidance to suppliers	- Development of human resources who can guide suppliers. **QC, Safety**		
	Ability to	Ability to Quality Control (QC) Ability to Quality Improvement	- Lack of Own proce			

BKC Training Matrix by position/function
(All Person / Selected person / For partners) BKCTM_V5

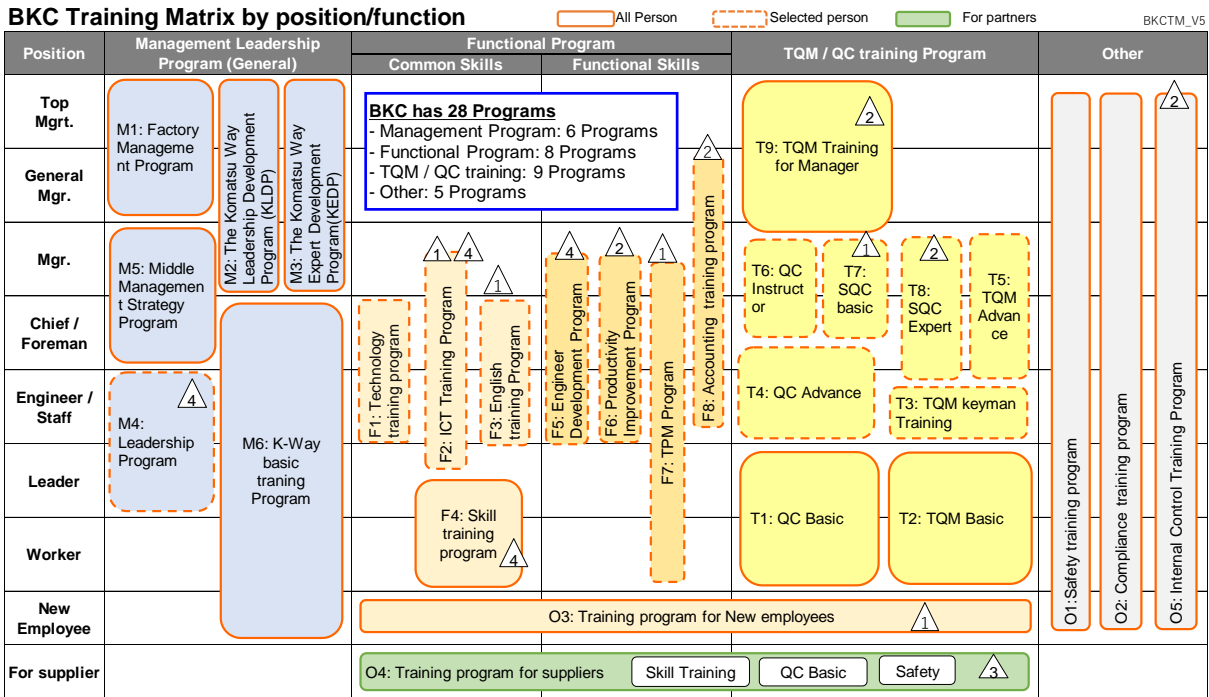| Position	Management Leadership Program (General)	Functional Program — Common Skills	Functional Program — Functional Skills	TQM / QC training Program	Other
Top Mgr.	M1: Factory Management Program	BKC has 28 Programs - Management Program: 6 Programs - Functional Program: 8 Programs - TQM / QC training: 9 Programs - Other: 5 Programs		T9: TQM Training for Manager ◢2	◢2
General Mgr.					
Mgr.	M5: Middle Management Strategy Program	F1: Technology training program ◢1 ◢4 ; F2: ICT Training Program ◢1 ; F3: English training Program	F5: Engineer Development Program ◢4 ; F6: Productivity Improvement Program ◢2 ; F7: TPM Program ◢1 ; F8: Accounting training program ◢2	T6: QC Instructor ; T7: SQC basic ◢1 ; T8: SQC Expert ◢2 ; T5: TQM Advance ; T4: QC Advance ; T3: TQM keyman Training	O1: Safety training program ; O2: Compliance training program ; O5: Internal Control Training Program
Chief / Foreman	M2: The Komatsu Way Leadership Development Program (KLDP) ; M3: The Komatsu Way Expert Development Program(KEDP)				
Engineer / Staff	M4: Leadership Program ◢4				
Leader	M6: K-Way basic traning Program	F4: Skill training program ◢4		T1: QC Basic ; T2: TQM Basic	
Worker					
New Employee		O3: Training program for New employees ◢1			
For supplier		O4: Training program for suppliers — Skill Training / QC Basic / Safety ◢3			

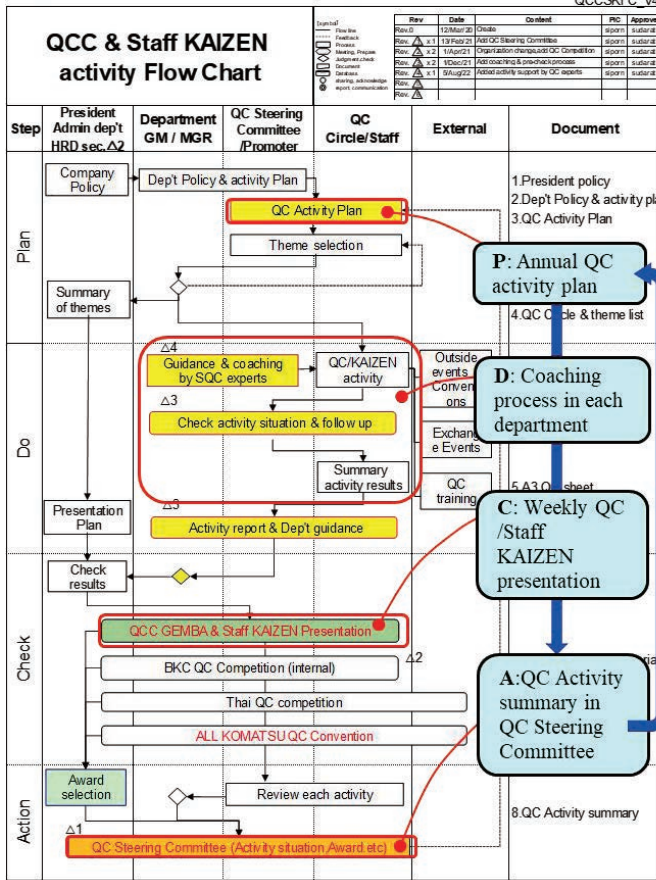Figure 6.6.3.1 BKC Training Matrix by position/function

(3) Develop human resources by activating QC Circle & Staff KAIZEN Activity

BKC has been developing human resources through improvement activities since before the introduction of TQM. The base of these activities is QCC activities. BKC needed to further refine its QC sense, develop leaders and instructors, and revitalize its activities.
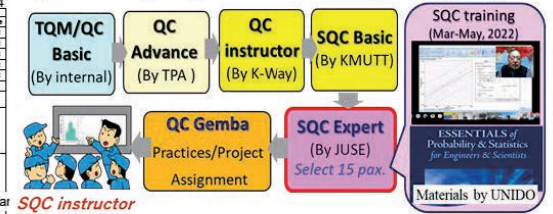
Therefore, BKC built a system to activate QC activities through **QCC & Staff KAIZEN Activity Flow Chart**, and BKC practiced activities with the aim of winning prizes at ALL KOMATSU QC Convention, which is held every year. Toward this end, BKC has enriched **QC Training Program**, created **Roadmap for SQC experts**, and cultivated human resources to support QCC activities. BKC currently has 12 SQC instructors and has a system to support various QC training and QCC activities. And then, **QCC GEMBA & Staff KAIZEN Presentation** is held on QC Day every Friday, and top management also participates and gives advice. Every year, BKC holds **Thai QC competition** together with our suppliers to improve each other's skills, and the president presents awards for outstanding cases. BKC has also provided QC training

to suppliers and internship students and has developed human resources together with the local community. As a result, BKC has won gold and special prizes every year at the ALL KOMATSU QC Convention, and motivation for QC activities of employees and local communities is increasing.

Figure 6.6.3.2 Human resource development by QCC & Staff KAIZEN Activity
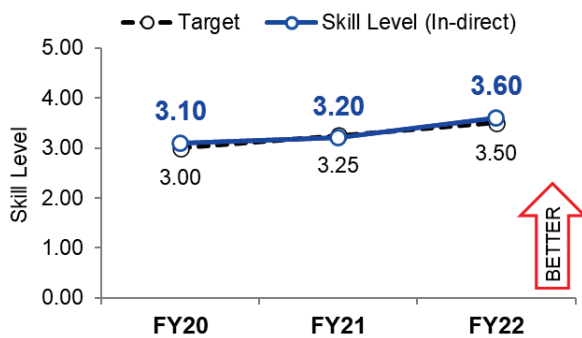
6.6.4 Effects
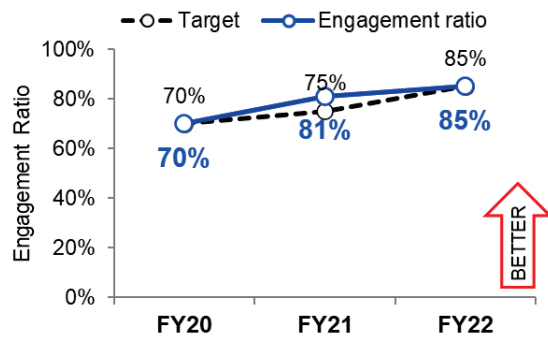(1) Tangible effect

Figure 6.6.4.1 Employee Skill Level

Figure 6.6.4.2 Engagement ratio of Training

(2) Intangible effect
1. BKC strengthened the training system to achieve strategies and BKC's human resources are contributing to demonstrating organizational abilities.
2. Employees who support the business are working with high motivation to increase their own skills.
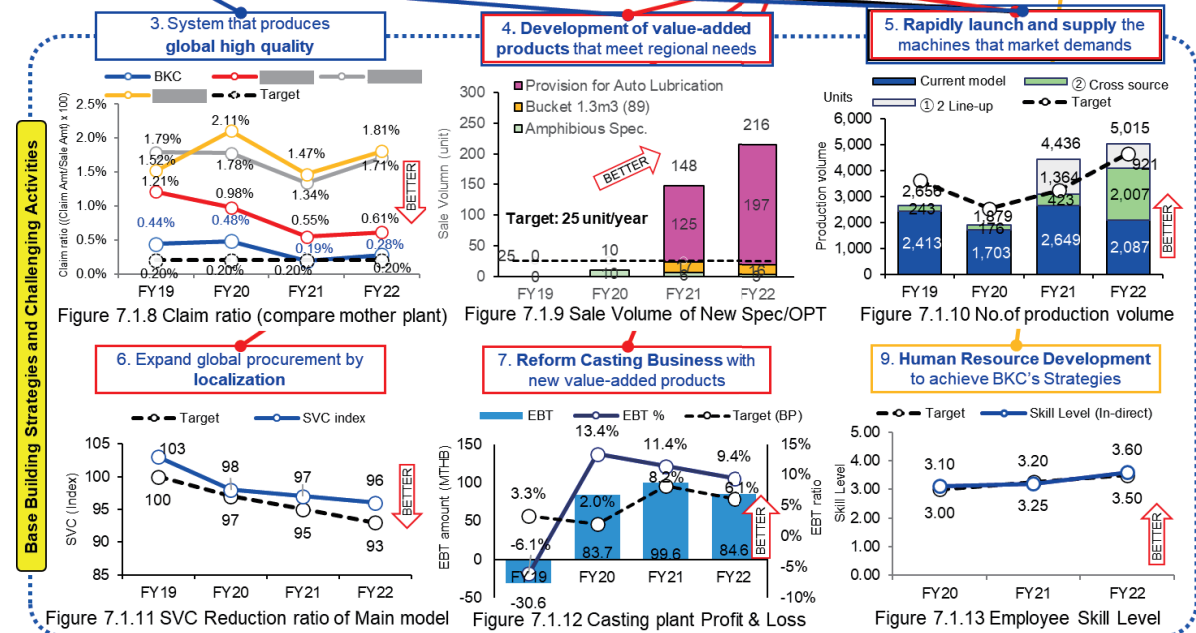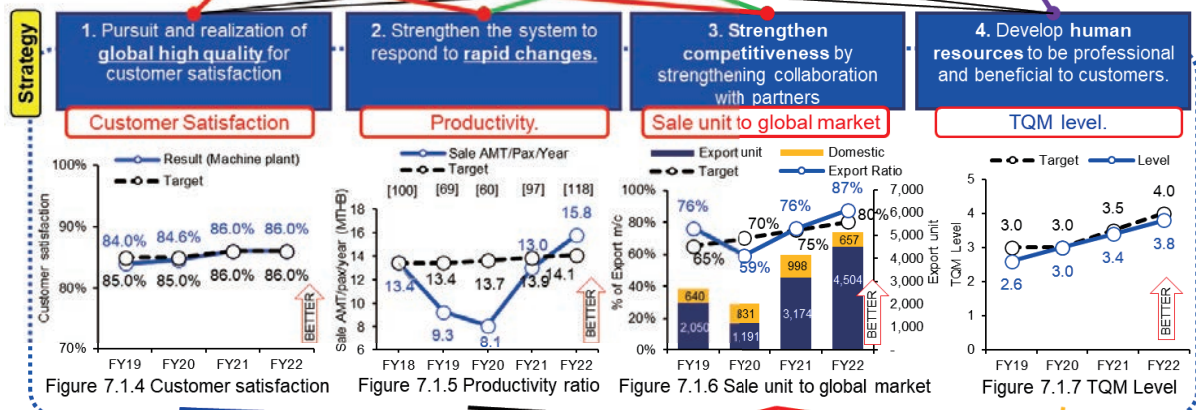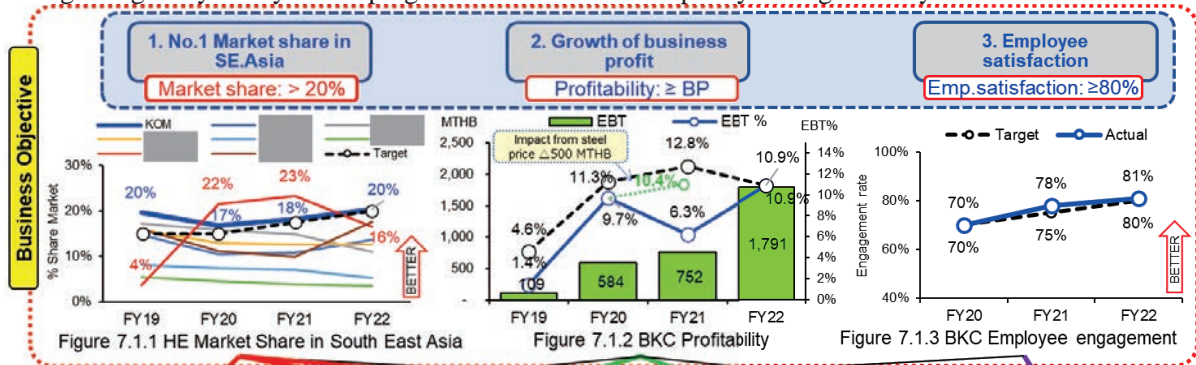
6.6.5 Future plan
BKC will expand the human resource development system to the Komatsu Group in Thailand, build a cross-function team, and develop humans.

7. Overall Effects of TQM Implementation

7.1 Tangible effect

BKC has implemented strategy through TQM and improved the achievement rate of business objectives and strategic targets by surely developing activities based on the policy management system.

Figure 7.1.1 HE Market Share in South East Asia

Figure 7.1.2 BKC Profitability

Figure 7.1.3 BKC Employee engagement

Figure 7.1.4 Customer satisfaction

Figure 7.1.5 Productivity ratio

Figure 7.1.6 Sale unit to global market

Figure 7.1.7 TQM Level

Figure 7.1.8 Claim ratio (compare mother plant)

Figure 7.1.9 Sale Volume of New Spec/OPT

Figure 7.1.10 No.of production volume

Figure 7.1.11 SVC Reduction ratio of Main model

Figure 7.1.12 Casting plant Profit & Loss

Figure 7.1.13 Employee Skill Level

7.2 Intangible effect

1. BKC believes that BKC has strengthened the management base supporting its business through TQM activities and increased the value of its corporate existence.

2. BKC's employees have become more tenacious, and more proactive, and we feel that have more smiles with partners.

3. BKC built strong management systems through TQM, and through its implementation, improved organizational ability, such as the development of special specifications, expansion of cross-sources, consistent assurance system from suppliers to customers, and business innovation through ICT.

8. Future plan

BKC will continue our best to make all people smile. BKC will challenge to achieve its business objectives by further evolving the practice of TQM activities.

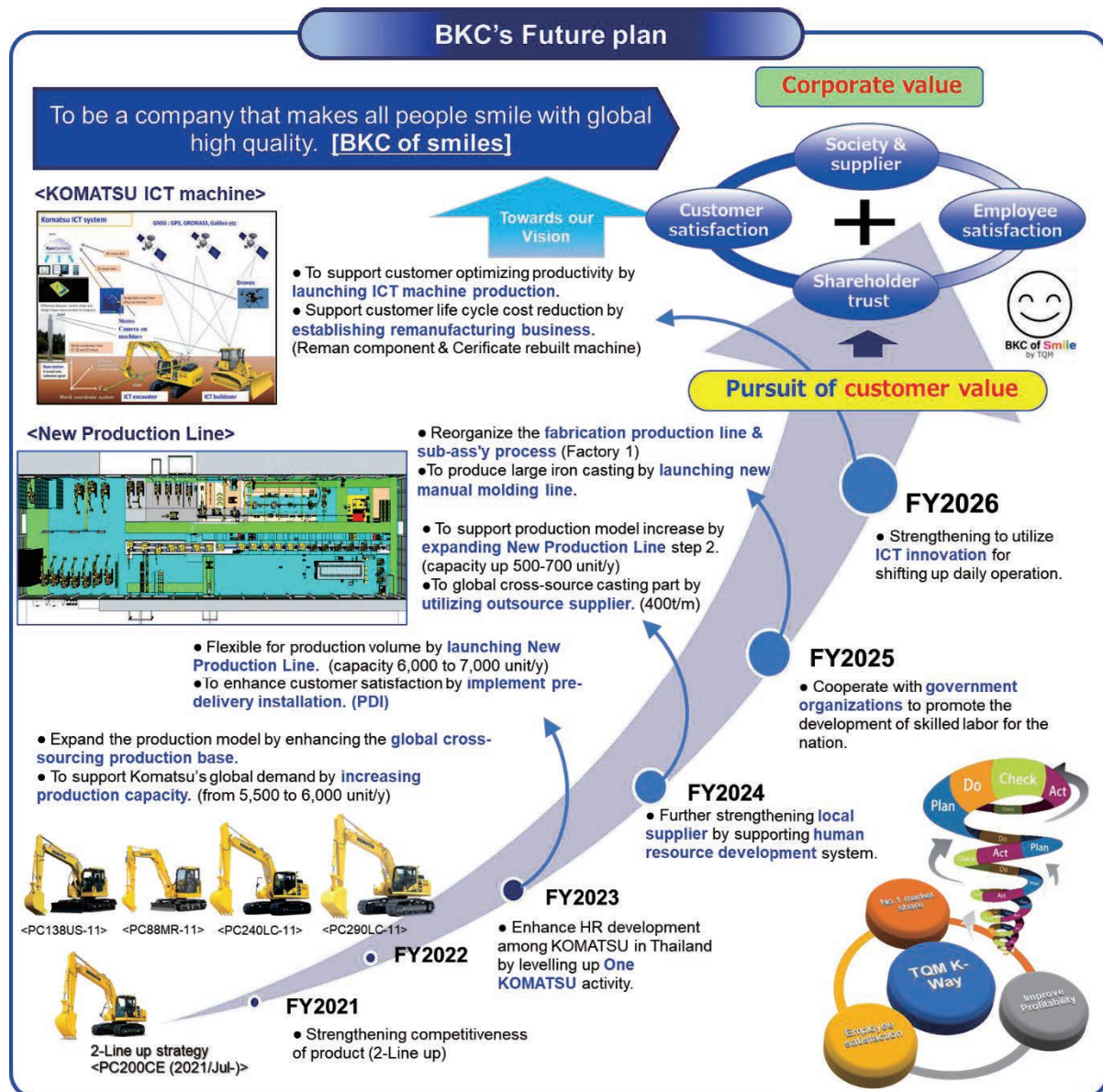BKC has the following future plans and will strive to provide value to our customers and move toward our vision.

Figure 8.1 BKC Future plan