# 3

# Corporate Innovation Value and Digital Transformation

- 3.1 Innovation Management
- 3.2 Customer Relationship Management
- 3.3 Sustainable Supply Chain Management



# **3.1 Innovation Management**

ltem	Content		
Policies, Commitments, and Importance	Giga Computing, driven by a spirit of continuous innovation, is actively expanding into new server application markets, especially in the AI field with GPU module architecture. Additionally, the Company focuses on leading-edge technologies such as direct liquid cooling (DLC), immersion cooling, and integrated control software. We consistently deliver diverse, high-quality products and services to global customers, embodying our core values of high performance, data security, flexible scalability, and sustainability in every product we offer.		
Responsible Unit	R&D Center, Development Support Division		
Short-, Mid-, and Long- term Goals	<ul> <li>Short-term goals (2024):</li> <li>1. Number of patents obtained <ul> <li>Encourage patent incentives for energy-saving and green products.</li> <li>The AC Power Team will enhance energy conservation through system architecture.</li> </ul> </li> <li>2. Proportion of carbon-reducing product revenue to total revenue <ul> <li>Increase the proportion of carbon-reducing products, such as direct liquid cooling (DLC) and immersion cooling products.</li> <li>Assist customers to build green data centers, reducing PUE, and recycling hot water for domestic use.</li> <li>Collaborate with customers on energy-saving initiatives in the data center environments, such as reusing hot water for snow removal.</li> </ul> </li> <li>3. Green product revenue as a percentage of total revenue <ul> <li>Increase the use of environmentally-friendly packaging materials.</li> <li>Increase the use of recycled plastic materials.</li> <li>Increase the adoption of high-performance components, such as switching from platinum to titanium, to improve product efficiency.</li> </ul> </li> </ul>	<ul> <li>Mid- and long-term goals (2025-2030):</li> <li>1. Number of patents obtained <ul> <li>By 2025, increase the number of patents by 5 to 10%.</li> <li>By 2030, green energy-related patents will be obtained.</li> </ul> </li> <li>Proportion of carbon-reducing product revenue to total revenue <ul> <li>By 2025, 20-30% of products will be low carbon emission products, such as direct liquid cooling (DLC) &amp; immersion cooling.</li> <li>By 2030, 80% of our products will be low-carbon emissions.</li> </ul> </li> <li>Green product revenue as a percentage of total revenue <ul> <li>By 2025, green product revenue will account for 5 to 10% of total revenue.</li> <li>By 2030, green products revenue will account for 50% of total revenue.</li> </ul> </li> </ul>	
Action Plan	<ol> <li>Incorporate carbon-reducing designs into product, and increase the proportion of environmentally friendly materials in packaging.</li> <li>Assist customers in building green data centers to reduce environmental pollution and enhance sustainability through effective recycling.</li> </ol>		
2023 Performance	<ol> <li>The annual R&amp;D expenditure was NTD 1.43 billion.</li> <li>A total of 36 education and training sessions related to product R&amp;D were held, with 479 participants and total training hours of 662.1 hours.</li> <li>Giga Computing has accumulated a total of 245 global patent applications, with 163 patents approved (including granted certificates).</li> </ol>		
Grievance Mechanism	Stakeholders can obtain product and technology-related information from Giga Computing through the technical support unit and marketing-related channels. Additionally, we conduct at least one internal audit annually to ensure the effectiveness of material topic management.		



Corporate Stable Operations

Corporate Innovation Value and Digital Transformation

Social Involvement and Digital Inclusion

Appendix 35

# 3.1.1 R&D Innovation Strategy

- Industry-leading AI & Cloud Servers
- Developed NVIDIA HGX™ GPU and MGX™ New Architecture AI servers
- Developed AMD INSTINCT<sup>™</sup> GPU AI servers
- Developed the latest Intel® Xeon Platform Series Servers
- Developed the latest AMD EPYC<sup>™</sup> Platform Series Servers
- Developed the latest AmpereOne Platform Series Servers
- Developed the latest G-Series Servers suitable for AI computing
- Developed the latest H-Series Servers suitable for Hyper-converged Infrastructure (HCI)
- Developed the latest S-Series Servers for big data storage services
- Developed the latest W-Series Workstations designed for multimedia designers or software development engineers
- Developed the latest R-Series Servers suitable for internal IT architectures of enterprises
- Developed the latest RACKLUTION-OP compliant OCP computing architecture, suitable for large-scale deployment of cabinet rack products in large data centers
- Develop the latest Liquid Cooling and Immersion Cooling Series products designed for energy saving and carbon reduction

## Continuously Develop Advanced Cooling Products and Optimize Energy Efficiency to Support Customers in Achieving Their Sustainability Goals

As one of the earliest server suppliers to invest in the R&D of advanced cooling technology, Giga Computing has been continuously innovating in recent years. Beyond servers and liquid tank solutions designed for immersion cooling, the market will soon welcome our comprehensive contact liquid cooling computing solutions. These offering will not only feature dedicated servers that compatible with various cooling equipment brands but also include our proprietary cold plates, cooling circulation equipment, and management systems. These measures aim to provide customers with a convenient one-stop procurement and service solution, assisting them

in achieving their sustainability objectives. At the same time, they help Giga Computing master key computing infrastructure technologies. This not only expands our business scope but also lays a solid foundation for the development of IT computing equipment for various future scenarios, accumulating valuable experience and a rich database.

## Innovate Data Center Deployment and Design Technologies to Expand the Market Demand for L11 Full Cabinet Rack Server Systems

Building on the existing technology leadership of L6 (barebones system) and L10 (fully assembled system), we have innovatively developed the L11 cabinet rack server array designed for data centers. With the rise of Al cloud computing, which differs from traditional mainstream cloud data centers, there is a need for multiple GPU AI servers to form foundational working groups, maximizing the data processing performance of AI. The current development deploys a structure where 8 GIGA PODs form a foundational working group. Each group is equipped with 32 G593 servers, totaling 256 NVIDIA H100 Tensor Core GPUs, achieving 1 exaflop (one quintillion floating-point operations per second) of FP8 floating-point performance. We will later offer diversified GIGA POD solutions, incorporating AMD INSTINCT™ GPU AI servers, to significantly enhance AI workload capabilities.

# 3.1.2 Energy Conservation and Carbon-Reducing/ Green Product Design

To address the increasing demand for data centers and the global trend toward carbon reduction, Giga Computing has developed server cooling solutions using DLC and immersion cooling.

The DLC solution involves immersing operating components like CPUs or GPUs in sealed pipelines filled with coolant. This approach eliminates the need for fans and heat sinks typically required in air-cooled servers. By efficiently transferring the heat generated from high-performance operations out of the server, this method allows for the installation of more processors in a confined space, helping customers achieve costs savings, reduced energy consumption and noise, and enhanced system performance in high-density IT deployments.



36

The immersion cooling solution is suitable for any enterprise application. With immersing servers in a cooling tank, where the heat generated by high-performance computing is conducted into a non-conductive cooling liquid. The cooling liquid distribution system then transfers the heat to either air or liquid cooling pipes, maintaining the servers' high-efficiency operation. The immersion cooling solution system does not require the use of pumps or sprinklers, significantly reducing equipment failure rates and maintenance needs. This approach not only lowers operating costs but also benefits the environment, with simultaneous upgrades in energy efficiency.

During the product lifecycle of a server, the phase with the highest carbon emissions is the usage stage, followed by the raw materials stage. After evaluating different cooling solutions during the usage stage, it has been confirmed that the immersion cooling solution offers the best energy-saving and carbon reduction effects, followed by the DLC solution.

## H262-Z63 Product Carbon Footprint



# 0.22%

♦ G492-ZD2 Product Carbon Footprint



## H262-Z63 Carbon Emissions by **Cooling Solutions**

(kg-CO<sub>2</sub>e/year)



#### G492-ZD2 Carbon Emissions by **Cooling Solutions** (kg-CO<sub>2</sub>e/year)





Digital Inclusion



The emergence of liquid cooling solutions is mainly due to the higher heat transfer efficiency of liquid compared to air, allowing heat to be dissipated more effectively. As a result, liquid cooling solutions improve cooling efficiency compared to traditional air cooling technologies, enhance the PUE of data centers, and significantly reduce energy consumption.



Corporate Innovation Value and Digital Transformation

37

**Case Focus** 

## Japanese Telco Leader KDDI Invents Immersion Cooling Small Data Center with Giga Computing

Japanese telco giant KDDI Corporation has invented a new class of data centers "container-type immersion cooling small data centers", that are mobile and eco-friendly. Giga Computing drew from its years of experience in the telco sector to provide the R282-Z93 and R182-Z91 Rack Servers for KDDI to use as the management and GPU computing nodes in the data center. In addition to being more energy-efficient, there are other advantages, as well. Immersion cooling can support a higher density of servers and protect the servers from the environment, whether it is high temperatures or salt and dusts in the air.

This Case uses advanced CPU and GPU configurations to empower data centers with robust computing power. Coupled with immersion cooling, this setup allows operators to integrate toptier GPUs like NVIDIA A100 Tensor Core GPU without encountering power consumption or heat dissipation bottlenecks. Giga Computing's expertise in the R&D and deployment of immersion cooling ensures smooth server operation within immersion cooling enclosures. This capability has supported KDDI in testing and constructing new-generation data centers. Moving forward, Giga Computing will continue to expand and upgrade its products to realize the vision of "Compute for the Future".



# 3.1.3 R&D Responsible Unit and Investment

The Product Center at Giga Computing is responsible for developing new products. This center, under the General Manager Office, includes various specialized units dedicated to ensuring the comprehensive development of products and managing other related matters. The center holds weekly departmental meetings to report on R&D progress and address problem-solving. The Strategic Marketing Division publishes a new product roadmap quarterly for relevant units. Additionally, at the end of the year, meetings are held with unit managers to decide on the R&D direction and plans for the next year. In 2023, Giga Computing had a total of 493 people dedicated to R&D, with a R&D expenditure of NTD 1.43 billion, accounting for 2.94% of total revenue.

## • Giga Computing's R&D Organizational Structure





# **3.1.4 Establishment of an Internal Innovation Culture**

Giga Computing places a strong emphasis on product R&D innovation. To foster internal R&D innovation, weekly meetings are held within the R&D unit to discuss product progress and the development of new technologies. To enhance development efficiency and reduce costs, we have invested in thermal design simulation software. This assists R&D personnel in identifying the best thermal management solutions during the early stages of product development. Additionally, to enhance the R&D capabilities of key personnel, 36 training sessions related to product development were held in 2023, with a total of 479 participants and 662.1 hours of training.

# 3.1.5 Intellectual Property Management

### Intellectual Property Management Responsible Unit

Giga Computing places great emphasis on product and technology R&D, as well as intellectual property protection. Under the Operation Management Center, the Legal and Intellectual Property Affairs Division is responsible for managing the Company's patent and trademark matters, protecting the innovations and intellectual property of both employees and the Company, and maintaining Giga Computing's competitive edge in the market.

## Intellectual Property Management Process (new patent application process, existing patent maintenance):

- 1. Patent inventors should submit their patent proposal application by filling out the "Patent Proposal Application Form" on the Giga Computing intranet's Legal and Intellectual Property Management System.
- 2. The Legal and Intellectual Property Department regularly compiles a list of patents with expiring annual fees and inquiries with department heads at or above the division-level whether to renew the annual fees for these patents. If the original department no longer exists, the Legal and Intellectual Property Department will select a new department for inquiry.
- 3. The Company has also established a "Patent Bonus for Energy-Saving and Green Products" program. If a division-level manager in the R&D unit confirms that patent pertains to "energy-saving/green product" technology, the relevant key patent items will be further annotated. For patents approved as key items, the related bonuses for patent proposals, applications, and approvals will be increased by 50%.

### **Patents Obtained Over the Years**

As of the end of 2023, Giga Computing has accumulated a total of 245 patent applications globally, with 163 patents granted (including those already certified).

	Giga Computing (Headquarters)	GIGAIPC	Total
Number of Patent Applications	225 cases	20 cases	245 cases
Number of Cases Approved (including those already certified)	155 cases	8 cases	163 cases



Appendix

# **3.2 Customer Relationship Management**

# 3.2.1 Policy and Responsible Unit

To develop a mutually beneficial supply chain relationship with customers, the Company establishes close communication channels to understand their feedback and meet their needs. The Company established interaction models with customers at key management levels, ensuring engagement between top-tier executives on both sides. Throughout the entire product lifecycle, there are substantial opportunities for interaction and information exchange with customers. Understanding and grasping customer supply chain development strategies, customer needs, and the value positioning of our products and services allows the Company to become an actively effective support organization for our customers.

The Sales Department uses various methods to understand customer and market needs, such as customer visits and project meetings. They collect and analyze crucial intelligence or information related to customers and the market and hold weekly internal business meetings to discuss product and service value positioning and develop strategies to meet customer needs. The Quality Department is responsible for regular tracking and review of quality improvements with customers, including audit reports, corrective actions, performance, customer concerns, and engineering complaints. They also conduct customer satisfaction surveys and facilitate communication.

## Responsible Unit:

The Quality Department summarizes the information and improvement measures of each department, and reports to the General Manager and other relevant units on a quarterly basis.

- General Manager: Understands customer needs and the value positioning of the Company's products and services, and decides on the interaction and communication models with customers.
- · Sales Department: Collects and analyzes important information or intelligence related to customers and the market, and manages customer communication and reporting.
- · Quality Department: Receives customer feedback on product usage and conduct customer satisfaction surveys, and manages customer communication and reporting.
- · Each department: Executes various activities throughout the product lifecycle to maintain customer relationships and communication.

# 3.2.2 Customer Satisfaction

The Company regularly measures customer satisfaction with its products and service quality as a basis for improving product and service quality and adjusting quality competition strategies. Customer satisfaction surveys, including regular or occasional communication, contact, and visits with customers, are conducted by the department responsible for customer service. This is achieved through routine customer interviews or by having customers complete online surveys. For customers with regular shipments and scheduled meetings, surveys are collected quarterly (in March, June, September, and December). For customers with occasional shipments or those who do not request regular communication, surveys are collected annually. If the average score is below 4 out of 5, improvement measures must be proposed. The Quality Department is responsible for tracking and implementing these improvements. In 2023, a total of 48 surveys were distributed, with 31 valid responses recovered, resulting in a recovery rate of 64.58%.

In the 2023 annual satisfaction survey, the satisfaction with the delivery date and the engineering change process did not meet the standards. Regarding the engineering change process, the satisfaction survey results were not fully reflective of actual data, as the survey was conducted with only a portion of customers. In the future, this item will be removed from the general satisfaction survey and will be specifically evaluated with certain customers who use this service to avoid biases caused by the survey sample. For delivery timelines, we will communicate with customers through our sales team to request actual forecasts and planning during discussions. Additionally, we will implement internal improvement plans to better meet customer requirements.

## Investigation Items:

### A total of 12 items in 5 categories

- I. Quality management and planning: Including green product and hazardous substances control management (satisfaction with hazardous substances control, environmental compliance of packaging materials, product compliance with customer green specifications, and adherence to international green regulations).
  - 1. Do the products from Giga Computing meet your expectations?
  - 2. Does the guality control meet your requirements?



Corporate Innovation Value and Digital Transformation

Appendix

- II. Service quality management: Satisfaction with handling of anomalies, repair services, response tracking, and the quality of problem resolution.
  - 1. Do the anomaly handling and improvement countermeasures report meet your requirements?
  - 2. Do the response, follow-up, and resolution of issues related to anomaly handling by Giga Computing meet your needs?
  - 3. Does the quality and speed of the Return Merchandise Authorization (RMA) of Giga Computing meet your needs?
  - 4. Are you satisfied with the service attitude of Giga Computing's sales or customer service units?
- III. Product shipment management: Satisfaction with the product packaging and the delivery date.
  - 1. Is the product delivered by Giga Computing on time/accurate/complete?
  - 2. Are you satisfied with the packaging of Giga Computing's products?
- IV.Effectiveness of technical support: Whether the technical solutions provided for product issues meet customer requirements.
  - 1. Does the technical support and response from Giga Computing meet your needs?
- V. Design and R&D: Conduct customer satisfaction surveys on five major categories, including product performance, reliability, and usage, etc.
  - 1. Does the R&D management performance of Giga Computing meet your needs?
  - 2. Do the hardware designs of Giga Computing meet your needs?
  - 3. Are you satisfied with Giga Computing's Engineering Change process?

## 2023 Customer Satisfaction Survey Results



Note 1: In 2023, the satisfaction survey was conducted solely for Giga Computing's customers, with data disclosure boundaries excluding the subsidiary GIGAIPC.

# 3.2.3 Customer Complaint Handling Process

Establish channels for customer inquiries and feedback regarding product quality, product safety, technology, and services to facilitate quality improvement and efficiency enhancement, with the goal of meeting customer needs and increasing customer satisfaction.



In 2023, we received a total of 66 customer complaints, all related to product functionality, performance specifications, or appearance issues. None of these complaints involved serious safety issues affecting customer usage. In order to effectively reduce the occurrence of customer complaints, we have also formulated the following improvement measures for the incidents that have been opened and handled:

- In the new R&D stage, collect unsolved issues from the Chief Engineer and the System Integration unit, and formulate countermeasures.
- · During the trial production stage, each quality-related unit verifies the production process and provides improvement suggestions.
- Collecting issues related to production and shipment from the Chief Engineer and plant. and tracking improvement measures.
- In the sales and service stage, we collect customer feedback from product application engineers and BYTE International Co., Ltd., to prevent similar problems from recurring.

# 3.3 Sustainable Supply Chain Management

Giga Computing views suppliers as long-term partners. To promote sustainable management across the supply chain, in addition to essential criteria such as competitive quality, technology, delivery, and cost, Giga Computing incorporates ESG considerations. The Company refers to the "RBA Code of Conduct", and evaluates existing supplier risks based on four management areas and four zero-tolerance regulations. Additionally, we have started planning an ESG screening mechanism for new suppliers. In 2023, we established the "Social Responsibility Commitment" and actively encouraged new suppliers to sign it. We are also setting up an ESG screening mechanism for new suppliers. In the future, Giga Computing will place greater emphasis on suppliers' adherence to environmental management systems, occupational safety and health systems, CSR, and hazardous substances. We are committed to selecting partners that meet sustainable procurement standards.

Giga Computing collaborates with approximately 460 suppliers globally, categorized into two main types of raw material suppliers and non-raw material (miscellaneous/engineering) suppliers. In 2023, the majority of procurement expenditures were allocated to raw material suppliers. In 2023, the amount of raw material procurement was approximately NTD 45.16 billion, accounting for 95.44% of the total procurement. Additionally, in 2023, Giga Computing's procurement from domestic suppliers accounted for 79.40% of the total number of suppliers, with domestic procurement expenditures comprising 81.10% of the total.

# 3.3.1 Supplier Management Policy

Giga Computing follows the "Sustainable Procurement Guidelines" of its parent company, GIGABYTE. The Company refers to the "RBA Code of Conduct" and evaluates risks based on four key management aspects and four zero-tolerance regulations.



## ◆ 4 Zero-tolerance Regulations

- Child labor
- Forced/Prison labor
- · Discharge of untreated toxic and hazardous substances or materials
- · Behaviors that cause immediate injury to employees



Appendix 42

# 3.3.2 Supplier Classification and Management

#### **Existing Partners**

Each quarter, all suppliers will be evaluated based on quality, cost, delivery time, and service and technical capability. Suppliers with lower scores will undergo annual quality and RBA spot audits, particularly focusing on categories such as chassis, power supplies, and PCBs. For suppliers identified as medium or high risk, we will provide corrective actions and measures, requiring them to implement improvements within 90 days. If no improvement is made, we will gradually reduce procurement from these suppliers, ultimately phasing out those that are unsuitable. In 2023, we conducted RBA audit for a total of 42 suppliers and the results showed that over 90% of suppliers are in good condition (with a score of 85 points and above), and the overall average score was 94.32. According to the overall audit results, of the 3 medium-risk suppliers and 1 high-risk supplier identified, all have been guided for improvement, and the improvement rate was 100%.

## Quarterly Supplier Evaluation for All Suppliers

Evaluation Item	Rating Ratio
Quality	50%
Cost	10%
Delivery Date	30%
Service and Technical Capability	10%

The total score is calculated based on the proportions of four aspects: quality, cost, delivery time, and service and technical capability, and grades are distinguished according to the score.

Total Score	Grade	Total Performance for the Quarter
91~100	А	Excellent
75~90	В	Moderate
60~74	С	Poor
Below 59.9	D	Worst

## 2023 Supplier Audit Rresults



## Regular RBA Audit Evaluation Items

Aspect	Evaluation Items		
Environmental Aspect	<ul> <li>Environmental permit</li> <li>Hazardous substance handling, transportation, and storage</li> </ul>	<ul> <li>Water resource management</li> <li>Energy consumption and GHG emissions</li> </ul>	
Social Aspect	<ul><li>Ethical corporate management</li><li>Information disclosure</li></ul>	<ul> <li>Respect for intellectual property rights</li> <li>Fair trade</li> </ul>	
Governance Aspect	<ul> <li>Duties and responsibilities of management</li> <li>Employee training plan</li> </ul>	<ul> <li>Employee feedback, participation, and grievance</li> <li>Risk assessment and risk management</li> </ul>	
Labor Rights	<ul><li>Working hours</li><li>Salaries and benefits</li></ul>	<ul><li>Humane treatment</li><li>Freedom of association</li></ul>	



**Newly Introduced Supplier** 

Since its official spin-off in 2023, Giga Computing has implemented procurement management based on a green supply chain, evaluating suppliers according to the following basic principles. Moving forward, the Company will continue to encourage new suppliers to sign the "Social Responsibility Commitment", gradually enhance the ESG evaluation mechanism for new suppliers, and track relevant data for continuous improvement.

- · Giga Computing's suppliers must fully comply with local laws and regulations and define their risk control mechanisms (low/medium/high risk).
- Giga Computing's suppliers should establish environmental, employee health and safety, and hazardous substance management systems. (Supplier environmental safety and health management status survey and supplier environmental safety score evaluation)
- Comply with Giga Computing's Harmful Chemical Substances Requirement (HCSR) and the REACH Substances of Very High Concern (SVHC) guidelines.

## **3.3.3 Conflict Minerals**

Tungsten, tin, tantalum, gold, cobalt, and mica are indispensable raw materials for electronic products. However, if these minerals are sourced from regions where forced labor, child labor, or armed conflict occurs, they are classified as conflict minerals, which oppress and harm local human rights and living conditions. Based on its commitment to respecting international human rights and fulfilling CSR, Giga Computing avoids using conflict minerals in its products. The Company conducts conflict minerals usage investigations with firsttier suppliers using the latest Conflict Minerals Reporting Template (CMRT 6.31) and Extended Minerals Reporting Template (EMRT 1.2). According to the suppliers' responses, Giga Computing references the gualified smelters published on the RMI website and the prohibited smelters indicated by customer feedback to manage its supply chain. If any use of non-compliant smelters is discovered, the supplier is immediately notified to make improvements and is placed on a watch list. If the supplier fails to comply, Giga Computing will notify relevant internal units to evaluate and potentially prohibit the use of that supplier. In 2023, Giga Computing initiated an investigation with 219 first-tier suppliers, achieving an 84.02% response rate for the CMRT and an 82.65% response rate for the EMRT. The suppliers who did not respond are still being tracked, and the feasibility of discontinuing their use is being evaluated. Each year, Giga Computing conducts surveys with first-tier suppliers based on the latest versions of CMRT and EMRT published on the Responsible Minerals Initiative website, updating the smelter list accordingly.

