Revolutionary New Business Model in the Manufacturing Industry Start-up Develops State-of-the-art EV Sports Car in Kyoto – Japan's Ancient Capital

Most car enthusiasts would know the Tommykaira ZZ that was manufactured in Kyoto in 1997. 17 years after its launch, this dream sports car underwent a rebirth in 2014 and returned as Tommykaira ZZ EV in Kyoto once again. The company responsible for this comeback is GLM Co. Ltd. (GLM), a start-up that develops and manufactures sports cars with state-of-the-art technology in the ancient capital of Japan with over 1,200 years of history.

GLM was founded by Chief Executive Officer Mr. Hiroyasu Koma, who started the company after completing a Business Graduate program at Kyoto University. One of the main reasons for locating his business in Kyoto was the vast presence of suppliers for parts required in the manufacturing of electric vehicles (EV), as well as the fact that Kyoto is home to various motorsports brands such as Tommykaira and DOME Co. Ltd.

Industry

Automotive

Applications

- Inspection and 3D Modeling

Benefits

- Reduction in man-hours and costs
- Improved accuracy for mounting and quicker development

Unlike major automobile manufacturers, GLM is a 'fabless' start-up that does not possess its own manufacturing facility. Mr. Leo Kawauchi, GLM's Public Relations representative, said, "There are two main pillars to our business, namely the assembly line and platform business. Our in-depth knowledge has enabled us to drive our business to greater heights. Through adopting innovative methods or technology, we set ourselves apart from the big players who have to grapple with size and cost constraints. In this way, we're able to develop cars that are in line with GLM's vision."

Challenges in Data Creation for Existing EV Components

In 2016, Hizeaero signed a supply contract with Boeing's Typically, the parts of an EV easily fit on the car chassis – because an EV requires 10% less components compared to a gasoline-powered vehicle, and also because of advances in modularization. As a platform business, GLM develops EVs platforms and provides them to other companies. Since many of its clients still utilize existing products, GLM required those CAD data in its development phase.

Early on, the team at GLM tried to measure these components manually, using hand tools such as calipers to create the CAD data. With this method, the team had to go through many iterations of prototyping and assembling components, which made part development an onerous and costly affair. The components' complex shapes made manual measurements challenging and the hand tools simply could not provide the accuracy GLM required. As a result, the team used to spend long hours making adjustments until they were satisfied with the quality. At times, they would make use of a laser scanner that was on loan to them, but it still did not provide GLM with reliable results. On one occasion, a scan was performed without first applying a preparatory spray, and the team had to supplement their scan results with manual measurements when they found missing data after three hours of work.

Compactly fitted components of an EV can be housed snugly on the car chassis.

Real-time Measurements While Scanning

The team at GLM first became acquainted with FARO's articulated arms when they visited another company's plant and witnessed it in operation on the shop floor. "Prior to that, we were only aware of measuring devices from other brands," said Mr. Nobuhiko Kawabata, a representative from the Body Design Department. "When we came to know of FARO's 3D measuring devices, we decided to ask for a demonstration since they are widely used in various industries."

On GLM's decision for choosing FARO amongst other brands, Mr. Kawabata explained,

> "The FARO Edge ScanArm HD is convenient, as it provides real-time measurements while a scan is being performed. If there is an omission, we can simply scan the specific part of the component that's missing.

The device also allows us to scan over desired areas and process the scanned data by ourselves. Most importantly, the Edge ScanArm is easy to use and anyone can operate it. We also appreciate its portability and ability to scan without a powder spray."

Measuring the EV platform using the FARO Edge ScanArm HD.

"We are a small start-up with 20 engineers, so we have to stay productive while maintaining efficiency at the same time," said Mr. Kawabata. He is pleased with his experience with the Edge ScanArm so far, praising it for its operability, versatility, and portability. He even went on to highlight the drastic reduction in measuring time – his team can now complete a measurement within one to two hours, when it previously took them half a day using the conventional method. He also cited improvements to the accuracy and speed of obtaining the CAD data for the various components. This has led to a quickening of the development process as the team can now make better decisions with the accurate data.

In preparation for their business expansion in Autumn 2017, GLM has also implemented the FARO Laser Tracker Vantage to their operations. Pairing it with the Edge ScanArm, GLM plans to utilize the TrackArm system when they relocate their Head

Polygon data of a scanned component.

Office and Development Lab. Mr. Kawabata said, “One of the key benefits of the Laser Tracker is its ability to track coordinate measurements accurately, and the ScanArm can then be used to immediately perform further measurements. This saves us time as we do not need to reconfigure the coordinates with each measurement. This will be very useful for us in the development of prototype vehicles.”

The Future with GLM Custom Car

GLM is currently in the midst of manufacturing their latest EV sports car. Unveiled at the Paris Motor Show in September 2016, it impressed even veteran participants who were familiar with the latest state-of-the-art technology.

Scanning a mock-up, which will be utilized for the actual EV development.

Leveraging on its complete vehicle technology, GLM also works on commissioned concept cars and show cars. With FARO 3D measurement technology, GLM can easily create CAD data by scanning actual objects, and this technology can also be used in vehicle remodeling to confirm positioning. In the near future, fully customized cars will be commonplace in every city.

About GLM Co. Ltd.

GLM develops and manufactures EVs, as well as provides in-depth technical expertise to third parties through their EV platform solutions. Based in Kyoto, where world renowned companies operate, GLM is an EV company with a dedicated team that aims to create something truly unique. GLM is committed to creating state-of-the-art cars using its expertise in manufacturing technology through a horizontal business model.

Further information: http://glm.jp/

About FARO

FARO is the world's most trusted source for 3D measurement, imaging and realization technology. The Company develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO's global headquarters are located in Lake Mary, Florida. The Company also has a new technology center and manufacturing facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of its FARO Laser Tracker and FARO Factory Array Imager product lines. The Company's European regional headquarters is located in Stuttgart, Germany and its Asia Pacific regional headquarters is located in Singapore. FARO has other offices in the United States, Canada, Mexico, Brazil, Germany, the United Kingdom, France, Spain, Italy, Poland, Turkey, the Netherlands, Switzerland, India, China, Malaysia, Vietnam, Thailand, South Korea, and Japan.

Featured Product

FARO Edge ScanArm HD
The FARO Edge ScanArm HD combines the flexibility and the functionalities of a FARO Edge measuring Arm with the high-definition Laser Line Probe HD creating a powerful contact/non-contact portable measurement system ideal for challenging application requirements.
For more information www.faro.com/FaroArm/sg

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