1. What's the purpose of the design - to win more prizes or is there a more practical reason?

All our concept vehicles serve a number of purposes. Firstly there is the very practical purpose of allowing us to consider the future possibilities of our designs in a way that is not linked to current production methods or models. It is easy to focus on modifying existing designs to improve our product range, but from time to time it is useful to consider things from a completely fresh perspective.

Secondly, we have the possibility to show our ideas at various exhibitions and dealer conferences around the world, prompting discussions and giving us valuable feedback from potential users.

Thirdly, we are able to boost the awareness of Doosan as an innovator and major investor in forklift manufacture, research and development.

Finally, we hope to enter the design into awards to enhance our brand image, celebrate our achievements and give an indication of the way forward.

2. How likely are we to ever see this machine in the iron? Are all of the technologies it employs available today? If the overall machine is unlikely to appear, which of the ideas could be seen on production forklifts in the next five years?

We are already looking into the recycled, eco-friendly materials for use in interior and exterior panels, which is different from the conventional forklifts which are mainly made of steel. The technologies (in-wheel motor, linear motor, solar-control glass and fuel-cell) which applied on the concept forklift are feasible at this moment or will be in the near future. Especially the augmented reality technology on the front glass which is already successfully deployed on a commercial scale, along with the development of IT technology devices. Because these cutting-edge technologies are developing into more efficient and powerful tools day by day, we believe something could be available to apply on forklifts within the next five to ten years.

3. More specific details on work guide system?

The intelligent work guide system on the concept forklift enables operators to work safely and efficiently thanks to augmented reality technology. The augmented reality is a term for a live direct or an indirect view of a physical, real-world environment whose elements are augmented by computer-generated graphics. A view of reality is modified by a computer. As a result, the technology functions are enhancing one’s current perception of reality. The system offers real-time additional information on working processes for maximum efficiency. By integrating barcode or RF technology in the load with augmented reality technology installed on the front glass of the cabin, the operator will have additional information at their disposal.

4. What's different/special about the electric drive-train/batteries? What would be the recharging times, as well as the shift times they enable?

As we enter into the 'Electric Vehicle' age, we see the stunning development of electric drive-train technologies in the car industry. The efficiency of the secondary battery technologies and the recharging time is developing at a rapid rate. We anticipate that these technologies are going to be developed quickly for industrial vehicles within the next decade.

5. The wheels look very interesting - what's the technology there?

The wheels comprise of five modular sections, designed to allow the replacement of the broken part only.

6. The tilting cab - thoughts behind this, how it works. What else is special about the cab? It looks very uncluttered - how will the machine be operated?

The cabin elevation and tilting function uses a hydraulic device in line with a high torque linear motor system. The traditional control lever is replaced by a multifunctional control joystick, helping to provide an intuitive, simplified user environment. The built-in air conditioning system provides the operator with custom control over the interior climate and the vacuum system positioned along the floor helps to maintain a clean work environment within the operator's cabin by sweeping dusts on the floor.

7. Extendable counterweight - by how much, and is this hydraulically powered? What extra capacity could this add?

The extendable counterweight works together with the hydraulic device via an in-wheel motor system which is installed inside the wheels.

We expect over 20% of extra-capacity to be added with a more balanced peak loading position.

8. Details of the mast design

An existing conventional mast uses iron chains and hydraulic cylinders, whereas the concept utilises a high-torque electronic linear motor system, to both lift and lower, and widen if necessary.

The monitoring cameras and safety sensors are set on top of the mast and at the end of the forks to improve visibility and the 3D scanner is installed on the mast to help the operator by offering cargo information such as weight and size together with intelligent work guide system.

9. Can we expect a Bobcat concept design next?

No plans currently, but we are always looking for future developments, so you never know!

10. How much time and money has Doosan invested in its Intelligent Concept Forklift?

The design project was initially discussed at the end of 2009 and performed throughout 2010. The video of the design was premiered at IMHX in November 2010. Our design teams work on a number of projects together, so the exact investment is not easy to quantify, but we do invest a great deal in R&D each year.

11. Briefly describe the Doosan Institute of Technology Industrial Design Centre (When established? Employee numbers? Location? etc)

DI's Design team was established in 1982 and is located in Doosan Institute of Technology in Suji, Seoul. The team comprises of lots of talented professional designers who have helped to increase sales and boost the Doosan brand through improvements to the design of excavators, wheel-loaders and forklifts as well as developing advanced concept equipments design. The team was recognized in 2009 Red-dot Design Awards, receiving the 'Best of the best' award for the Doosan concept excavator(CX) design.

12. What is OLED technology?

The term OLED is a simplified form of Organic Light-Emitting Diode which is widely used for displays of information-technology devices. OLED emits light at a specific wave length from the electrons and electron holes when voltage is applied to the organic thin film placed between the anode and cathode. Doosan produces various high efficiency, long life organic light emitting materials (electron hole injected layer, hole transfer layer, light emitting layer, electron transfer layer) at a very high level of purity.

13. What are augmented reality systems?

The augmented reality is a term for a live direct or an indirect view of a physical, real-world environment whose elements are augmented by computer-generated graphics. A view of reality is modified by a computer. As a result, the technology functions by enhancing one's current perception of reality.

14. When will a prototype be ready?

The specific plan for the prototype is not yet made so far but it was designed with the aim to be feasible in 2020. We anticipate that various elements of the design will be transferred to our next generation of models as they are developed.