An innovated welfare vehicle for elderly

L-D. YANG, D-A. WANG, D-S. HUANG. ***An innovated welfare vehicle for elderly and action inconvenient people.*** *Gerontechnology 2014;13(2):312;* doi:10.4017/gt.2014.13.02.299.00 **Purpose** The purpose of this study was to design, manufacture, and assembly a welfare vehicle for elderly and action inconvenient people. So, the elderly and action inconvenient people can have a self-esteem, autonomy, and independent life of action. This vehicle was designed using many innovated high-tech equipment such as safe action and biomedical supervisory control system, back car and anti-crash system, body temperature, pressure, and blood sugar measurement recall system, door and wheelchair remote control system, etc. There are seven sub-projects in the project, which are: (i) Lightened vehicle body structure design and manufacture technique, (ii) integration technique of steering and suspension systems for a welfare vehicle, (iii) constructing a balanced wheelchair for the elders, (iv) the development of driving maneuver and control for a welfare vehicle, (v) The development of electrical motor module for the power of the welfare vehicle, (vi) Safety driving and driver physical information monitoring in a welfare vehicle, and (vii) human factor engineering analysis in a welfare vehicle (*Figure 1*). **Method** This vehicle (*Figure 2*) was mainly designed by energy saving, humanity, easy operation, and satisfying elderly drive. There are many techniques and subsystems including subsystem design and manufacture, key technologies research and manufacture, interface design and fabrication, system integration test and verification, etc., have been achieved for this welfare vehicle system. The innovated vehicle has obtained about 15 patents within 5 years. The vehicle fabrication and performance include: (i) Lightened movement of vehicle body and chassis. (ii) Vehicle veers around stability analysis. (iii) Wheelchair elevated using double chain shaft mechanism. (iv) An omni-directional wheelchair movement and anti-vibration design. (v) Vehicle internet system design. (vi) Driving control module design. (vii) Turn around and transportation design. (viii) 5kw in-wheel motor and driving unit design and manufacturing. (ix) DSP base battery management system design and fabrication. (x) Anti-crash and vehicle side sensor system for action safety. (xi) Receive and report back system of biomedical information. (xii) Vehicle human-machine interface system. **Results & Discussion** The welfare vehicle can meet the elderly and action inconvenient people needs which include to drive wheelchair up to the vehicle directly, to drive safely with the anti-crash censoring system, to measure their body status using biomedical system and report back information from local medical center.

Keywords: mobility & transport, welfare vehicle

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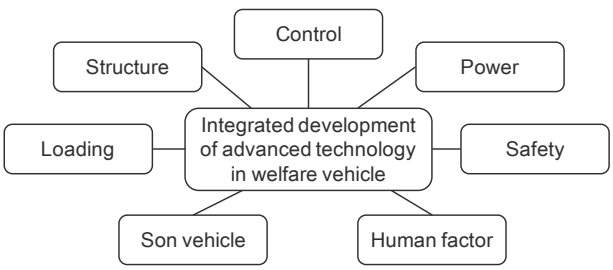

Figure 1. Project structure and connection

Figure 2. The new welfare technology vehicle