

PROPOSAL

To



**Korea · Israel Industrial
R & D Foundation**

From

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PROJECT TITLE

3D Visual Map Based Car Navigation System

PROJECT BUDGET

	First Project Period	Second Project Period	Third Project Period	Project Total
<i>Project Duration</i>	12 months	-	-	12 months
<i>Project Cost</i>	\$ 980,038	-	-	\$ 980,038

SUBMITTED BY

Signature

Printed Name

ISAAC LEVANON

HO-KYUNG CHO

Designation

Chairman & CEO

General Manager

Company

3DVU

DPI

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PART I TECHNICAL PROPOSAL

EXECUTIVE SUMMARY

3D Visual Map Based Car Navigation System (CNS) Development is a joint project between a Korean company, Daewoo Precision Industries Co., Ltd. (hereafter DPI) and an Israel company, 3DVU, Ltd. (hereafter 3DVU) under the KORIL-RDF grant. The purpose of this project is to jointly develop the most realistic car navigation system.

The core technologies are;

- 1) Aerial photographs or/and satellite imageries which would be able to be stored and formatted to stream down to the car navigation system's graphic display module with limited computing performances and memories while maintaining the original image quality and;
- 2) A new 3D car navigation hardware platform which would be designed and optimized to display a realistic three-dimensional graphics and physical storage (DVD-ROM or HDD) for multi GB of satellite imageries or/and aerial photographs. 3D Visual Map solution utilizes aerial photographs or high resolution satellite images and conventional vector map database with all attributes to produce a realistic three-dimensional car navigation system

Objectives

The objectives of this joint development is to develop a new generation CNS with the most advanced real-time three-dimensional display feature utilizing aerial photographs or satellite imageries.

The ultimate goal of a Car Navigation System has been considered to be a system that can be installed in a vehicle and is aimed at helping the driver of a vehicle by giving him/her directions to the desired destinations. However, customers deserve more beyond the original functions of Car Navigation Systems. Customers deserve more realistic map display with fancier graphic interfaces.

In conventional car navigation systems, the map normally consists of line segments (links), points (nodes), polygons, texts, symbols, and icons to represent the world. However, such simplified vector map graphics are often too simple to draw the real world, which is in a complex series of various land cover types and shapes. However, high resolution satellite imageries or aerial photographs show the world as it is with all the shapes, colors and textures enabling the driver "landmark navigation." Simply, satellite imageries or aerial photographs provide much more information to the drivers.

Displaying high resolution satellite images or aerial photographs in its full resolution used to require workstations with high CPU performances and memories with specialized visualization software. Therefore, it has been regarded to visualize the high resolution satellite images or aerial photographs in Car Navigation Systems since most embedded digital devices normally utilize very limited CPU performances and memories compared to PCs or workstations.

However, 3DVU successfully developed and commercialized a visualization solution to display a massive 24-bit full color raster images without diminishing the original image quality with an embedded device of very limited CPU performances and memories.

To achieve the goal of this project, 3DVU and DPI are ideal strategic partners in terms of technological and marketing capabilities.

Daewoo Precision Industries is the first company developed and commercialized car navigation systems in Korea. DPI has also set important milestones in Korean Car Navigation history. For instance, DPI is the first company developed and commercialized the 1:2,500 scale detailed town map, DVD-ROM based full 3-D CNS with real building textures and shapes, and the English car navigation system.

Throughout 7 years of experience in the business, DPI has a full capability of digital mapping and GIS engineering, application software development, graphic controls, data conversion, hardware design and manufacturing, porting and testing, and graphic interface designs. Both 3DVU and DPI have thoroughly reviewed each other's technological capabilities and came up with a full confidence to develop another milestone product satisfying the progressive customers' needs in automotive industries. DPI is committed to become the world leader in car navigation system manufacturer by providing the most advanced products and services to the global market.

Commercial Value

Since DPI first developed and commercialized the Car Navigation Systems in 1997, DPI has shown steady sales records. In year 2002, DPI sold more than 20,000 units. Approximately 60% of sales were generated by automotive manufacturing customers for O.E.M uses each year. In other words, more than 12,000 units are demanded by automotive industries for O.E.M. uses.

Ssangyong Motor Company, one of the major OEM customers, produces luxury passenger cars (Chairman), luxury SUVs (Rexton and Korando), and luxury minivans (Rodius). Ssangyong Motor Company is committed to be the market leader in the high-end luxury vehicle segment in Korea rather than producing economic cars. Thanks to its unique high-end luxury policy, Ssangyong Motor Company deserves the most advanced and unparalleled Car Navigation Systems differentiating from the competitors withstanding the higher costs.

Due to the reason above, DPI is prospecting this particular project as a precious opportunity to develop the most advanced high-end Car Navigation System product exceeding Ssangyong Motor Company's high-end standards if this project is funded and completed successfully. It would be reasonable to say that the Ssangyong Motor Company alone demands over 10,000 units each year at \$1,000 per unit. In other words, revenue of 10 Million U.S. Dollars can be generated each year from a single O.E.M customer. DPI is also prospecting GM-Daewoo Auto & Technology's positive evaluation on the 3D Visual Map Based Car Navigation System for their new high-end luxury passenger car to be unveiled shortly.

<DPI's Sales Estimation in Domestic Market over 2006 ~ 2010>

		2006	2007	2008	2009	2010	Total
OEM	SYMC	\$10,727	\$9,746	\$10,746	\$9,783	\$11,000	\$51,317
	GM DAT	\$3,235	\$5,464	\$7,530	\$7,904	\$8,500	\$32,633
Aftermarket	PDA	\$12,000	\$12,000	\$14,400	\$14,400	\$16,800	\$69,600
	Other Portable Devices	\$5,000	\$5,000	\$6,000	\$6,000	\$7,000	\$29,000

Besides O.E.M business, we have the plan to develop portable navigation system which is another solution as aftermarket products in CNS market. Annual sales of portable navigation in Korea is around 50,000 ~ 80,000 units per year. The result of this cooperation can be also applied to some modifications.

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