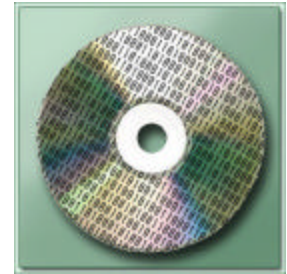**Venture Development Corporation**
Embedded Software and
Tools Practice

THE 2005 EMBEDDED SOFTWARE STRATEGIC MARKET INTELLIGENCE PROGRAM

Volume II: Embedded Software Development Tools

Prepared by:

Chris Lanfear
Steve Balacco
Matt Volckmann

Embedded Software and Tools Practice
Venture Development Corporation
August 2005

The following white paper contains some of the top-level findings from the embedded software development tools segment (Volume II) of VDC's *2005 Embedded Software Strategic Market Intelligence Program.*

MARKET OVERVIEW

The embedded market has evolved since the early nineties when software providers were compartmented and offered real-time operating systems or software development tools. Software providers could leverage the technical strengths from strategic partnerships in an effort to provide embedded developers with a total software solution for their device development while minimizing research and development costs to develop their own operating systems or development tool chains.

As time passed, many software providers converged at the center, either through acquisitions and mergers, internal development, or some combination of both, in offering a software solution that spans operating systems and tool chains and competing head-to-head in various vertical markets. Regardless of the direction of convergence, the focus was on providing an integrated and supported solution from a single vendor. Some in the industry began to vertically orient or bundle product offerings in an effort to assist OEMs by providing the infrastructure and an integrated package for:

- Jumpstarting development;

- Improving productivity;

- Managing development schedule and costs; and

- Improving reliability in the development of different devices.

> "There is an interesting 'rename embedded' campaign ongoing with one of the major players in the embedded market. Although embedded can be seen as a somewhat 'niche' term and hence industry, renaming it doesn't make it grow or make it more accessible to the outside world. We believe that new technologies such as Eclipse will have a more profound effect on the embedded market than trying to rename it and that this unilateral renaming campaign is more distracting than beneficial to the market as a whole."
>
> *– OS/Software Tools Vendor*

Developing software for enterprise, desktop and embedded devices has similar traits and challenges, however, requirements for device software development are more stringent when it comes to determinism, execution speed, footprint limitations, power management, bandwidth, and safety-critical systems if applicable. These challenges are compounded by a fast-moving silicon market across a wide spectrum of processor derivatives, introducing added levels of complexity from multi-core/multi-processor architectures that can include microprocessors, microcontrollers, DSPs, FPGAs, etc.

Call this market what you may, embedded software developers are faced with enormous technical challenges to complete their projects on time, within budget, and with the highest reliability. Competition in the embedded software market offers more options when selecting software solutions. From VDC's perspective, embedded software vendors now look to differentiate themselves as suppliers of embedded technologies that respond to the way developers are actually working, from inwardly focused technology companies with a "one size fits all" mentality.

Catalysts for change include the declining reliance of embedded system manufacturers' on in-house developed operating systems, recognition of the open source movement and Linux as a legitimate alternative to commercial OSs and in-house development, and a herd mentality toward support for the Eclipse platform as a unifying framework for software development. Past VDC research has revealed various levels of dissatisfaction for the availability of high-quality development tools for Linux. Increasing adoption of Linux has focused supplier energies to address the needs of embedded software developers rather than attack the competition.

An extensive analysis of the world market for unbundled software development tools used in embedded applications leads us to the following conclusions on the world market for unbundled embedded software development tools:

- VDC estimates that the market for software development tools and related services reached $247.8 million in 2004. For 2003, VDC's revised market estimate was $243.4 million. This represents an increase of 1.8% year over year.

- Based on recent success, operating system suppliers' strategy to provide their own tools is unlikely to change. The continuously evolving and maturing Eclipse platform has become an effective way for embedded software suppliers to reduce their costs in lieu of developing and maintaining their own proprietary tools or partnering with third-party proprietary tool suppliers.

- Major players in the market have changed their tactical sales focus from the project to the corporate executive level preaching standardization, cost benefits, and device development optimization.

- Availability of free GNU and silicon vendor tools offer a compelling economic proposition, especially to cost-conscious embedded systems manufacturers, presenting a good enough alternative to higher quality tools from standalone tools vendors.

- VDC estimates the Americas region as the largest consuming market for embedded software development tools and related services with this region accounting for greater than 48.2% of all shipments.

- Language support for embedded software development efforts in 2004 continued to be centered on the C and C++ programming languages where many vendors offer both under the same license, and to a lesser extent on the assembly language.

- VDC estimates the ARM architecture as the leading architecture supported by embedded software development tools vendors.

- Development teams using proprietary OSs (in-house developed) continued to account for a large percentage of embedded software development tools shipments in the embedded marketplace. However, this percentage has been declining as embedded systems manufacturers become more receptive to the use of and economic proposition offered by commercial operating systems. Linux ranks third behind proprietary and VxWorks as the most supported operating systems.

- In 2004, VDC estimates the leading suppliers of embedded software development tool solutions to be Metrowerks, Wind River Systems, and ARM.

- Just as embedded operating systems suppliers have moved the value proposition beyond the operating system, embedded software development tool suppliers must look to move the value proposition beyond editors, compilers, debuggers and IDEs in addressing the complex issues and optimization of the hardware and software in device development.

ABOUT THE STUDY

This study covers the worldwide market for software development tools employed in the development of embedded systems. Specifically, our research efforts focused on the market for: Compilers, debuggers, GUI-driven development environments (commonly known as Integrated Development Environments) and related products and services.

Geographic Regions

Americas; EMEA (Europe, Middle East, Africa); Asia-Pacific

Leading Vendors

Based on our estimates of shipments from the largest market shareholders.

Application Segments/Product Categories

- Automotive – Including electronic control units in chassis systems, powertrain electronics, body electronics/security systems, and in-vehicle information and computing systems.

- Consumer Electronics – Including set-top boxes, Internet access devices, home audio/video, mobile phones, and pagers.

- Industrial Automation – Including manufacturing and process controls, motion controllers, operator interfaces, robotics, building automation, HVAC and other controls.

- Medical Devices – Including patient monitoring equipment, medical therapy equipment, diagnostic equipment, imaging equipment, and surgical systems.

- Military and Aerospace – Including commercial aircraft, military aircraft, satellite systems.

- Office/Business Automation – Including copiers, fax machines, printers, scanners, multi-function devices, RAID, disk/tape drives and arrays, and server appliances.

- Retail Automation – Including point-of-sale (POS) terminals and peripherals.

- Telecom/Datacom – Including switches, infrastructure, and datacom devices.

Venture Development Corporation (VDC) is an independent technology market research and strategy consulting firm that specializes in a number of telecom/datacom, mobile & wireless, industrial, embedded, component, and defense markets. VDC has been operating since 1971, when the firm was founded by graduates of the Harvard Business School and Massachusetts Institute of Technology. Today, we employ a talented collection of analysts and consultants who offer a rare combination of expertise in the market research process; experience in technology product and program management; and formal training in engineering and marketing. VDC's clients include thousands of the largest and fastest-growing tech suppliers in the world and the most successful investors participating in the markets we cover.

For more information, please contact:

Chris Lanfear, Director, Embedded Software Practice, 508-653-9000 ext. 145, chrisl@vdc-corp.com or Marc Regberg, Senior Vice President, 508-653-9000 ext. 111, msr@vdc-corp.com

VENTURE DEVELOPMENT CORPORATION

One Apple Hill Drive ♦ Box 8190, Ste. 206 ♦ Natick, MA 01760-9904

T: 508.653.9000 ♦ F: 508.653.9836 ♦ E: **info@vdc-corp.com** ♦ W: **www.vdc-corp.com**

abw – 8/05