Examining the Value of ARM® Open Source Platforms: Use Cases and Future Trends

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There is a growing trend towards open, higher volume ARM processor-based, multimedia centric innovation platforms. This article examines this trend from both the perspective of the SoC providers and SoC customers, as well as the value of the open source platform compared to traditional proprietary platform models. From the pioneering days of BeagleBoard to today's most recent open source ARM Linux® platform development including ST-Ericsson Snowball, PandaBoard and beyond, open source platforms enable creativity for developers on shoe-string budgets.

"Design is not just what it looks like and feels like. Design is how it works." This quote by Steve Jobs, co-founder and chief executive officer of Apple, Inc. talks to in large part the spirit of the open source engineer and his or her passion to go deep into the software stack beyond the innovation confines of locked down, proprietary black box HA platform models. With the recent introduction of affordable, open source platforms like the BeagleBoard, PandaBoard and Snowball there is a growing community of dedicated designers who are developing deep knowledge and gaining new skill sets via unprecedented access into the software stack and the latest ARM chipsets.

The BeagleBoard, first introduced in 2008 was a revolutionary low-power, low-cost single-board computer based on low-power Texas Instruments processors. It featured the ARM Cortex™-A8 series core with all of the expandability of desktop machines, but without the bulk, expense, or noise. The BeagleBoard – which is like the Swiss Army knife of the open source development world was built by a small team of TI engineers with open source development in mind, and as a way of demonstrating the Texas Instrument's OMAP3530 system-on-a-chip. It was used as an educational board in colleges around the world to teach open source hardware and open source software capabilities.

Today, an even faster updated version, the BeagleBoard-xM, is sold to the public and has a large community following just three years later at http://beagleboard.org/.

PandaBoard is the first open OMAP™ 4 mobile software development platform. It includes the OMAP 4430 Processor and dual-core ARM Cortex-A9 MPCore™ with Symmetric Multiprocessing (SMP) at 1 GHz each allowing for 150% performance increase over previous ARM Cortex-A8 cores. The PandaBoard community shares information at http://www.pandaboard.org.

Snowball was most recently introduced in February 2011. Snowball is a low power, low cost Single Board Computer based on the ST-Ericsson Nova™ A9500 processor (Dual Cortex A9 + Mali 400 GPU) that targets hobbyists and professional developers wanting to prototype new embedded designs. It will help developers to create applications for Android®, Meego™ and Ubuntu™. And it too is gaining traction and has an active open source com-

munity called Igloo, http://igloocommunity.org where ODMs, OEMs and application developers can gather, exchange information and ideas and share their latest developments. Movial was asked to develop and run the Igloo community, and port Android and MeeGo to the Snowball board by ST-Ericsson because of our significant experience in working with the open source community and domain proficiency in Android and MeeGo.

By leveraging these low-cost open source platforms and getting involved in the open source community, developers are bringing to market the most highly specialized, vertical (think medical and automotive) and creative applications seen to-date in the industry. And while the possibilities with open source platforms are virtually limitless, this kind of creativity comes with a huge learning curve that demands creative discipline.

Open source platforms can be likened to working or playing with Legos. Developers are uninhibited by design constraints – they are free to innovate and develop new value and differentiation for their customers. And when designing for a customer, these low-cost platforms are ideal in helping customers "window shop" and see the power of an ARM SoC before officially kicking off a project. This is especially useful in highly specialized vertical applications which have unique requirements and allows for a richer prototype to be built and ultimately better development.

However, developing on open source means there is lots of self-education and training to do. You don't have an entire engineering team working on a project – you are there by yourself and it's like having training wheels on a bike that eventually must come off. It's a painful learning curve, but by joining a supportive community like Igloo, you'll be learning and even teaching at the same time. It is important to focus on the basics – understanding the architecture, how everything works before focusing on what you need to differentiate. Don't try to master everything at the same time. Open source developers understand that you need to invest time to learn before you see a return on investment, but rest assured the time will be well spent as the flexibility and adaptability in terms of development is unmatched by any proprietary platform.

"You can't just ask customers what they want and then try to give that to them. By the time you get it built, they'll want something new." This second quote by Steve Jobs talks to the design quandary that developers typically face and points to a dilemma uniquely posed by open source platforms. Because these platforms are so versatile and flexible you can ask your customers what they want and definitely give it to them, but with the ability to do so much, developers often get lost down the path of creativity and even after understanding what the customer expects, they embellish or embroider the feature functionality (because it is so fun and it can be done) that they lose their sense of time, delivery dates slip and indeed, by the time it is built, the customer will want something new. But because with software, there is always something new – today's knowledge becomes less valuable as time goes by. If you are pressed for time, or just ramping up, then partnering with an experienced Linux engineering provider is a good way to get the best of all worlds – the help you need – from expert design methodologies, project management, integration of different open source and third party solutions, to the source code and the added benefit of learning a lot in a short amount of time.

At Movial, customer real world use case, open source platform innovations range from digital signage at bus stops where adverts/content is displayed and adjusted to meet the demographics of passengers throughout the day, to connected home baby monitors, hospital medical tablets and, of course, the latest advancements in smart phone, tablet and connected devices. With a nod to the future and the growing demand for internet enablement on non-traditional lower volume, but highly specialized devices and tools, the always on, always connected community will indeed best be served by the innovative, versatile and flexible open source development platform community.

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