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Unleashing a Tidal Wave of Pent-Up Innovation

For decades, core intellectual property in sensing, control, and communications has remained largely trapped in niche origins like aerospace, industrial automation, and on-board vehicle systems. The Pervasive Internet is accelerating the availability of this legacy innovation across all markets.

Investors: Beware of Seeing M2M through Old IT Lenses

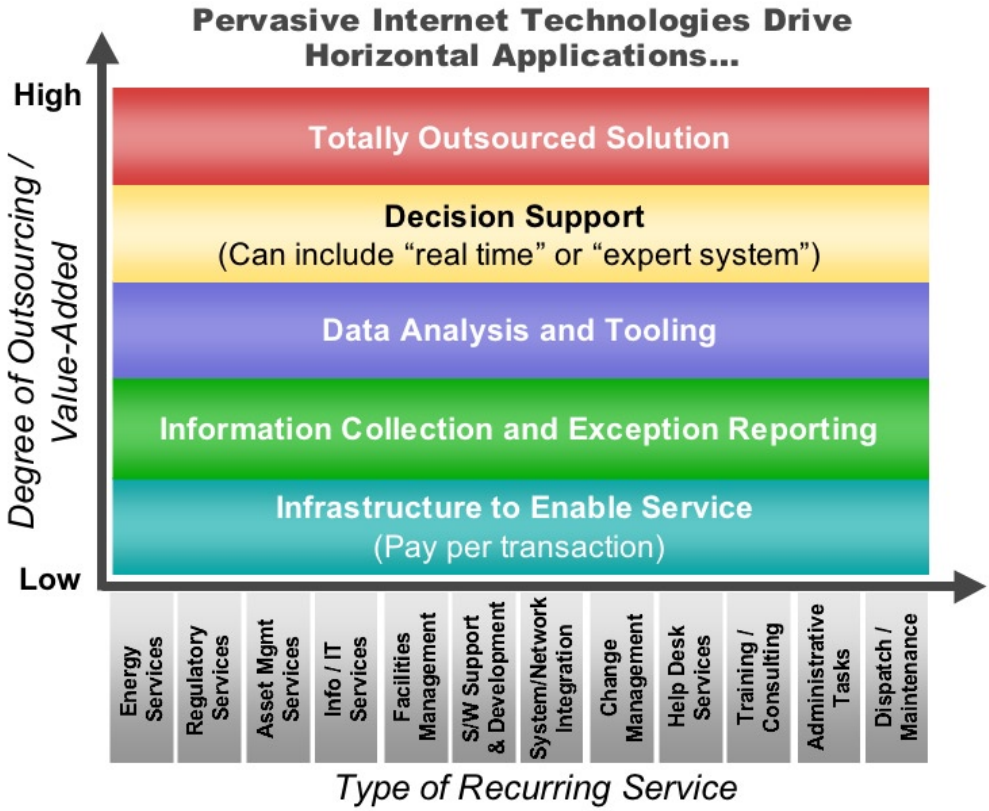
Lately, we've had quite a few discussions with venture capitalists and private equity investors about the opportunities ahead for M2M, pervasive computing, and wireless sensor networking. The enthusiasm for these subjects is clearly growing in the investment community. But investors also exhibit lingering confusion and reticence about these enormous emerging opportunities. We believe their concerns stem from outmoded IT thinking.

The question that best typifies investor skepticism goes something like this: "Will the integration and application opportunities in the pervasive and wireless sensor space really scale up, or are these opportunities trapped in the tyranny of vertical applications and industries requiring hopeless amounts of specialization and case-by-case complexity?"

The Interpenetration of Horizontal and Vertical

First of all, we think it's misleading to frame the question in terms of "horizontal vs. vertical." In a genuinely connected world, those two traditional axes will feed each other reciprocally in ways not seen in a world of isolated devices and business systems without real-time inputs.

The Pervasive Internet presents huge opportunities for turning vertical-specific functionality into a generalized horizontal tool or set of apps—much greater opportunities than, for example, ERP represents today.



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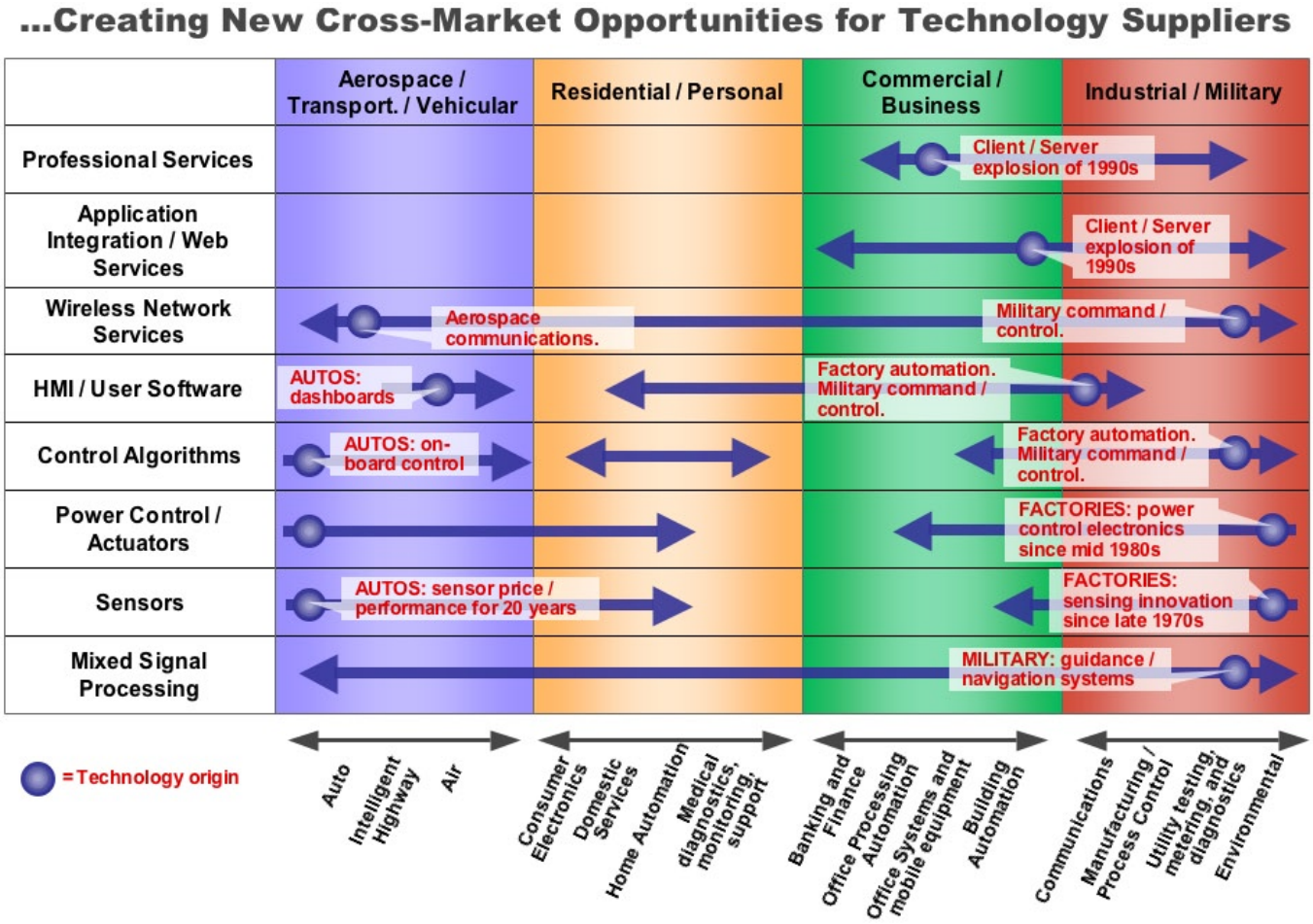

ERP: Enterprise Automation Gets Halfway There

ERP essentially automates the general ledger, but it does not change the fundamental information flow of business. Today, the automation of ERP offers much less value than it might, because it remains trapped in the "batched" or "historical" computing model of yesterday. In this model, inputs from the past are collected and processed to tell you what happened—not *what's happening*.

In a connected world of networked devices, enterprise systems become authentically automated by virtue of real-time inputs. Without the pervasive computing component, the gains of enterprise automation are comparatively small.

Decades of Underutilized Knowledge

Even more important, but less visible to the untrained eye, is the potential for most M2M technologies (sensors, processors, power electronics, etc.) to reach a point of discontinuity and scale up considerably—and rapidly.

Why is this? Many of the most relevant and promising technologies have sprouted in quite discrete spaces, and have not yet migrated across the economic landscape. To date, they have been utilized in fairly narrow applications such as defense systems, factory systems, and on-board vehicle systems. It would not be an overstatement to say that, for decades now, specialized innovation has been largely unable to move out of its niche origins. The era of the Pervasive Internet will unleash it.

At the level of sensing, control and algorithms, and the ability to build smart systems, there is a vast amount of accumulated knowledge and technology that has only just begun to migrate. Much sensing innovation first appeared commercially in vehicles because the volumes were so large. Now that it is more mature and less expensive, it is beginning to be seen in residential and personal applications. Similarly, sensing and monitoring technologies driven by

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the demands of factory automation have now begun to facilitate systems automation in commercial buildings.

Still, M2M technology migration has been partial and slow, largely due to the absence of key enabling factors—chief among them a global data network (the Internet), device-oriented wireless standards (ZigBee, Bluetooth, Wi-Fi), and intelligent device management systems (from a growing variety of vendors)—that now exist.

Networking Changes—and Accelerates—Everything

As the adoption of pervasive computing and M2M takes hold, excellent but narrowly applied (and thus slowly developing) technologies will feel the pressure required to become fully mature and generalized, and these technologies will quickly migrate to many other broader applications. We predict that when this occurs, it will fuel a discontinuity that will lead to untold growth and scale. Ultimately, this growth will feed all the information-systems applications that investors fear will not scale to the size and with the speed necessary to justify investment.

In other words, networking changes everything. Investors will be greatly mistaken if they bring the IT thinking of the "batched" computing era to a networked world. Such thinking fails to match the realities of a world outfitted with billions of smart, connected devices—the world of the real-time enterprise.

We certainly are not suggesting that the device networking and smart services opportunities come without risk. The various verticals do have their specific requirements, and these will need to be addressed. But the M2M / Pervasive Internet phenomenon will greatly accelerate everything, including our understanding of the business problems and the best ways to resolve them.

What we are suggesting is that the advantages of moving forward now clearly outweigh the risks of "standing pat."

The real-time, low-bandwidth communication and control of billions of networked devices across the globe is the doorway to the next era of corporate IT, business optimization, and customer service.

About Harbor Research, Inc.

Founded in 1983, Harbor Research Inc. has more than twenty years of experience in providing strategic consulting and research services that enable our clients to understand and capitalize on emergent and disruptive opportunities in high technology. Harbor's clients are leaders in communications, computing, control, and content. The firm has built extended relationships with larger multi-line companies including AT&T, ABB, General Electric, Danaher, Eaton, Emerson, Hewlett Packard, Honeywell, Hughes, IBM, Intel, Invensys, Lucent, Motorola, Rockwell, Siemens, and Texas Instruments, as well as with growth companies such as EMC, Cadence Design, Conexant, Qualcomm, and PTC.

We also work with a broad array of emergent start-ups and pre-IPO technology ventures. We have built relationships with a number of significant Pervasive Internet players, including Questra Corporation, Xsilogy, DataSweep, eDevice, Wireless Innovation, and emWare, to name a few.

Harbor Research provides studies, workshops, briefings, research retainers, and consulting engagements of uniquely high value to both technology suppliers and adopters. Please contact us using the information below.

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