Why are Environmental Health, Safety & Sustainability Software Vendors Failing?

It's time to bring the multi-tenancy software model to the EHS Software Industry

by

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According to an Environmental Business Journal survey (EBJ, September 2015), the U.S. environmental information systems and services industry generated revenues of about $1.6 billion[1] in 2014; this amount will likely increase to $1.75 billion in 2015. EBJ research indicates that "about 600 firms are competing in this still fragmented industry with the top 5 accounting for 15 percent of the market." Similar to forecasts from other research analyst firms, EBJ expects that the industry will continue to grow at a double-digit rate per year, and is poised to grow faster in 2016 than in any previous year.

Despite the impressive and sustained growth of this business sector, some troubling issues dominate this space. Specifically:

- With such positive economic indicators, why do so many startups in this business fail?
- Why have companies that research analysts designated as market leaders only a year or two ago failed to capitalize on their advantages? Why haven't they translated their growth into a profitable business?
- Why has no single company (or small group of companies) come to dominate this business sector as is typical of many other industries offering information services?

It's actually shocking that given the amount of attention the environment and climate change command from regulatory bodies, the business community, and the public, the industry doesn't have a better record with software addressing customers' environmental tracking needs. I would argue that it was their failure to adopt the multi-tenancy model for their software architecture. While many companies advertise their software as a "cloud-based" or "web-enabled," many are not true SaaS providers.

There is considerable debate in the industry about whether companies planning to organize and manage their environmental and sustainability data should know or even care about multi-

tenancy. The truth is that multi-tenancy is the only proven SaaS delivery architecture that eliminates many of the problems created by the traditional software licensing and upgrade model where software is installed as a single-tenant application on a customer's premises or at a customer's or vendor's data center. In contrast, in multi-tenancy, all clients access the same software on one or a set of linked servers.

A turbulent year for many EH&S "market leaders"

Several years ago, IHS Inc., a $2 billion company based in Colorado, embarked on an aggressive acquisition strategy to consolidate the fragmented EHS software space and create a market leader. The company's failure to attain its goal became clear to investors on October 7, 2015, when the CEO announced that IHS had hired an investment banking firm to manage the divestment of its EH&S software assets. IHS made this major reversal in strategy after a portfolio evaluation determined that these assets—bought between 2007 and 2012—were no longer aligned with the long-term goals of IHS. The company stated that part of the rationale for its decision was the high level of private equity interest in the EH&S software segment (as evidenced by the buyout/growth capital investment by JMI Equity in Intelex and the purchase of Enviance by Battery Ventures). Both of these transactions happened in the last 12 months.

Some of these transactions are still praised as success stories—or in the parlance of Silicon Valley, as good "exit strategies." But what's really going on here?

While I agree that private equity interest has been high (as witnessed by the exponential growth of incoming calls to my company), I doubt that it's the main reason that IHS is making a strategic U-turn and putting its software division up for sale. Nor is it the principal reason that Enviance, Intellex, and other EH&S software providers have sold themselves to private equity firms. Instead, I believe these companies had no option other than to put themselves up for sale at a deep discount as they simply ran out of money and could not keep their operations afloat. My conversations with employees from these companies suggest that all struggled with cash flow and profitability issues before being put up for sale.

In the case of these three companies, IHS installed its software on the individual premises of its customers. Enviance and Intellex offered many of its products over the web, but these were single-tenancy installations. That is, each customer acquired its own instance of the software, which may have been installed in-house or at a data center.

Verdantix has recently published the results of its survey of installed EH&S software implementations. Of the 7,855 evaluated, 70% were single-tenant on customer premises, 20% were single-tenant, vendor hosted, and only 10% were multiple-tenant, vendor-hosted. In other words, most of the companies in the EH&S space do not run a single version of their software

maintained at one location. Instead, they run multiple copies at a single or at multiple locations, with the high likelihood that these multiple copies are not alike, but instead represent multiple versions or contain specific customizations for individual customers. This model is crushing their growth and scalability potential.

Remember the various versions of Microsoft's operating system that were in use and supported by Microsoft up until a few years ago? Windows XP, Vista, 7, 8, and 8.1… Why do situations like this occur, and why are they tolerated? Because the organization or individual customer is in charge of when to update the software. Upgrades can be cost-prohibitive due to their complexity and resource requirements, and as such, are understandably put off for as long as possible.

Maintaining multiple versions of a software application that runs on their customers' infrastructure and behind their firewalls, or in data centers on behalf of their customers, is simply too cost-prohibitive for small companies in the EHS software space where budgets are limited and the complexity of applications overwhelming. Oracle and SAP can handle on-premises installed (ERP) software because they have the resources to do so and can command astronomical fees for their services. It is noteworthy, however, that even Oracle faltered when it tried to enter the EHS space in the eighties with Oracle Environmental and Oracle Health and Safety. The software failed to capture much market share, in part because of a lack of domain knowledge. A few years after these applications appeared in the marketplace, Oracle exited the business, selling out to Radian, who got acquired by Dames and Moore, who got acquired by URS, who sold the software to Atrion international, who was acquired by IHS in 2010, whose EHS software is now for sale. Other major companies that tried and failed to develop a viable EHS enterprise software business include Microsoft, HP, Infor, Johnson Controls, and Schneider Electric, to mention just a few. The only other industry that comes close to this many failures is health records management. Perhaps it is understandable considering similar complexities of applications and delivery model.

An argument for multi-tenancy for environmental software

Multi-tenancy offers distinct benefits over traditional, single-tenant software hosting. A multi-tenant SaaS provider's resources are focused on maintaining a single, current version of the application, rather than having its resources diluted in attempting to support multiple software versions for its customers. If a provider isn't using multi-tenancy, it may be hosting or supporting thousands of single-tenant customer implementations. Trying to maintain these installations is costly for the vendor, and these costs become the customers' costs—or the vendor's problem.

Multi-tenancy has other advantages as well. Because every customer is on the same version of the software and the same instance, none are left behind when the software is updated to

include new features and innovations. Vendors can integrate and deploy new features not only more quickly, but also more frequently, and at no additional charge to the customer. Because only a single installation needs to be updated, firms can focus more on keeping abreast of new technologies and meeting new user requirements rather than on dealing with the disruptions associated with major upgrades every year or two and the resultant bookkeeping involved with maintaining multiple versions of the software. Customers are relieved of headaches associated with major software upgrades. Lastly, a single software version creates more of a sense of community among users and facilitates customers' ability to share their lessons learned with one another.

Most vendors in the EH&S software space cannot sustain their businesses and grow unless they are true SaaS providers.

If we look at the landscape of companies that tried to compete in this space over the last 20 years, it is littered with failures. In fact, there are more failures than success stories. Here are just a few of the applications that are either no longer in business or just limping along:

- Envista
- Radian (Dames and Moore/URS)
- Caribou Systems
- GIS/Key
- EcoInteractive
- Enovis

- SitePro
- Clear Standards
- PointCarbon
- ClimateCheck
- ArsenaultLegg, Inc.
- GreenSuite

Even some of the most-recent prominent startups that raised significant capital did not make it (approximate number in parentheses is funding companies raised and was taken from publicly available sources): Blue292 ($20M), Planet Metrics ($10M), Hara ($35M), and C3 (>$50M). All of these companies (among others) either folded or were forced by their investors to sell at a loss, at a deep discount, or, in the case of C3, a billionaire Tom Siebel startup, had to pivot to a different business.

Many of the companies still competing in the EHS software space were founded before the Internet revolution and, at the time, nobody knew what multi-tenancy meant. These companies built their software using client-server technology. ESP, ESS, Dolphin Software, Syntex Management Systems Inc., Atrion International, Inc., and others of their ilk were promising young EHS software companies, for example, when SaaS was not part of our vocabulary. All of them were acquired by IHS for between $200 and $300 million. IHS had a golden opportunity to dominate this space after their string of acquisitions a few years ago gave them the largest market share. However, their entire installed base was on-premises, and IHS made no attempt,

or did not know how, to consolidate the applications of the companies they had acquired and build a multi-tenant software service.

They were the only company in the EH&S space with the financial resources to pull off this consolidation of power, but unlike Microsoft or Apple, they lacked the vision to cannibalize their existing business and replace it with a SaaS delivery model. It turned out their options were either doing that or else, and they chose, to their detriment, else.

Multi-tenancy requires a new architectural approach. Companies have to develop applications from the ground up for multi-tenancy. Once companies commit their limited financial resources to one architecture, it becomes nearly impossible for them to switch to the multi-tenancy model. Consider the difficulties in doing so: The code and underlying database must be changed. Then, at some point, the company has to migrate all data in the installed single-tenant base to the multi-tenant version without affecting existing users—and all the while, the company must assure them that their interactions with the software will not be adversely affected. Imagine doing this when the software is installed not in a single center but on thousands of servers, and you can understand the immense hurdles faced by purveyors of single-tenant applications with a large installed base. In this light, IHS's decisions become more understandable. And for this reason I am skeptical that many current vendors still occupying the upper-right quadrant of research analyst's reports will be able to make a switch to the multi-tenancy fast enough.

Geoffrey Moore, the author of the best-selling *Crossing the Chasm*, recently wrote on his blog: "SaaS is now a fait accompli in enterprise IT, but I still think its primary value proposition is not well understood. We tend to think of it in terms of consumption economics—pay as you go, with the burden on the vendor to keep us subscribed—each of which is both real and valuable. But to me by far the greatest contribution of SaaS is to free the enterprise from the tyranny of the product release model."

He continues:

"Anyone who has ever implemented an ERP application knows what I mean. The one thing you know for sure after having just implemented any given release of an enterprise software product is that under no circumstances will you ever implement the next one. After all, you have just spent 18 to 24 months, and up to 10 times the license price of the software, to perform open-heart surgery on your enterprise. Who in their right mind would want to undertake that again anytime soon?

"So, to conclude, you have paid maintenance of 18 to 20% per year for anywhere from five to ten years for the express purpose of not availing yourself of the innovation created during that time period. This is horrible for you and no good for your vendor either, who must maintain

back releases of the product with increasingly painful workarounds. It is not a vendor problem or a customer problem or even a product problem. It is a business model problem."

The EHS software industry has not offered the SaaS model to its customers fast enough.

Additionally, customers have failed to understand the nature and significance of the differences between single-tenant and multi-tenant applications. Instead, they've looked to their environmental consultants or research analysts to tell them what to do. And more often than not they took their recommendations, eventually partnering with on-premises software vendors who reaped enormous implementation, maintenance, and upgrade fees.

I have seen the same cycle time and time again. Customer hires consultant, consultant makes recommendation, customer purchases software from vendor that has been recommended by consultant, software is installed at one site or across multiple locations of the organization, vendor goes out of business or sells out, same consultant is called in again for new recommendation, and the cycle continues anew.

Companies that are considering SaaS hear all sorts of things from EHS software vendors hoping to tap into the momentum of cloud computing. Among the most common is that multi-tenancy is a "techie" thing that doesn't need to be part of the conversation. Here is another common one: "Multi-tenant? Sure, we can do multi-tenant, single-tenant, whatever you need!" In either case, the term "multi-tenant" might mean anything the vendor chooses it to mean, including nothing at all. Over last 10 plus years I've answered many proposal questionnaires my company participated in. Many of them were designed by hired consultants to help a company select "the best" software or to find the "best fit." I don't remember a single one of those questionnaires asking about multi-tenancy. As a result, many deals that we did not win at the time are coming back as new RFPs due to "failed implementation" on premises. I only wonder how much customers have spent in terms of real dollars and missed opportunity during that time.

The fact is, multi-tenancy is the core foundation of modern Software-as-a-Service and shouldn't be brushed aside, generalized, or massaged into something that suits a vendor's self-serving interpretation of SaaS. Having experienced first-hand the true benefits of multi-tenant SaaS, I can't conceptualize how SaaS would have delivered those benefits if it wasn't multi-tenant.

As Moore put it: "So do not kid yourself. The transition to SaaS cannot happen fast enough. We all know that our current commitments to on-premises enterprise applications are sunk deep into the IT infrastructure and that unpacking them to transition to SaaS is a major undertaking. But it does not get easier or better with age, and this time it really is a game changer. So, take a

deep breath (maybe a couple more), gird your loins (not quite sure what that means in an era when sheet armor is no longer in vogue), and get on with it."

Potential buyers of IHS were greeted with the following warning from the Verdantix announcement of the sale: "The challenge for the buyer will be the cash needed to upgrade the legacy applications that IHS has bought over the years and integrate them into a single platform which can compete with the new breed of integrated EH&S and operational risk management platforms. Without such an investment, the business will not achieve the 30% to 50% growth rates that a financial investor would require. A second challenge for a potential buyer is managing the exposure of the IHS EH&S software business to the oil and gas sector." In addition, I would add that a real challenge is how to translate legacy software that is unconnected into a SaaS application, and how to convince customers after you developed an untested SaaS platform to move to it? This will be very hard to do.

Multi-tenancy is the future of software

Successful SaaS companies (Workday, Salesforce, Xactly, Net Suite, Kenexa, Locus Technologies, and others) were developed from the ground up to support multi-tenancy. From a technical standpoint, they offer proven multi-tenant solutions, with years of market maturity and customer feedback and involvement. And none of them offers an alternative for on-premises installation of their software. The underlying foundation of multi-tenant SaaS is applications built for multi-tenancy. Otherwise, a lot of backward engineering may be required to make a traditional software stack support multi-tenancy.

EH&S Software Needs to Follow the March Toward Multi-Tenancy and a Subscription Economy with Recurring Revenue

I've mainly focused here on enterprise EH&S software. In the multi-tenancy model, users access software and associated data via a single URL. Some of the same forces that have made the multi-tenancy model the most cost-effective in the enterprise world are driving changes in how consumer software is deployed to individual computers. In particular, companies are switching from selling to leasing their software, and infrequent major upgrades with assigned version numbers are being replaced by frequent, unnumbered updates delivered over the web.

For example, while initially slow to embrace it, Microsoft has been working on transitioning to the SaaS model and its strategy is beginning to pay off. "Windows [as well as Office 365] will be delivered as a service bringing new innovations and updates in an ongoing manner, with continuous value for our consumer and business customers," explained Microsoft in its full statement to the Verge magazine in November 2015. "We aren't speaking to future branding at this time, but customers can be confident Windows 10 will remain up-to-date and power a

variety of devices from PCs to phones." Translation: Windows with no version number, just Windows as a service. Instead of dealing with the headaches of big releases, Windows' users will experience regular improvements and updates without ever having to agonize over when is the best time to bite the bullet and upgrade to the latest release.

Adobe has changed its operating model to SaaS as well: You can no longer install Creative Suite that includes popular Photoshop or Illustrator from Adobe on your hard disk; instead, these applications are only available to subscribe to. Autodesk has followed a similar path with its popular AutoCAD software. You can only subscribe to it these days. By the end of its 2017 fiscal year, the 30-year-old software company Intuit, maker of QuickBooks and TurboTax software, wants to shift the majority of its revenue from desktop licenses to recurring subscriptions. Companies are also offering more opportunities for customers to store their data and files on the web, making them accessible at all times from multiple devices (Box, Dropbox, OneDrive, Google Drive, iCloud Drive, Autodesk 360, Amazon AWS and S3 online storage, etc.). After all, it is a subscription economy with recurring revenue becoming the Holy Grail for software delivery models: We are already living it. Venture capital and private equity firms get this—pure SaaS companies are commanding much, much higher valuations from their counterparts stuck in the old nineties software delivery model.

Conclusions

It's time for customers to embrace the SaaS model and save themselves from the grief of buying software, only to discover two years later that not only does it not work, the vendor they bought it from is about to go out of business or abandon the version they just installed.

Serious contenders in the environmental software space have to make the multi-tenancy model theirs as well. It will be critical in the coming years—as regulations and tracking requirements evolve—to be nimble and dynamic for customers. The only way to stay in the game will be with a multi-tenancy model. Unfortunately, it may be too late for many.

Companies who make a switch before it is too late will reap many benefits of SaaS. SaaS vendors will be able to attract a broader customer base by offering a subscription-based model, which has a much lower upfront cost to customers.

The transition is sometimes easier on the customer than on the vendor, where the transformation to a new business model can be incredibly disruptive, but the long-term growth potential should outweigh some of that transitional discomfort while helping EHS software companies to deliver on the promise of better environmental data tracking and compliance.

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