

# WHITE PAPER

THE INTEGRATED SOFTWARE PLATFORM  
– AN INNOVATION IN COMPUTING

OCTOBER 2009

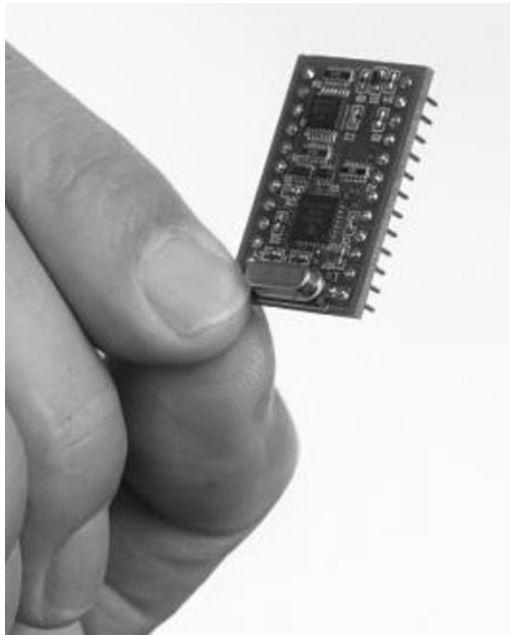
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## Contents

Overview .....	3
The birth of Silicon Valley .....	3
New era, new challenges.....	4
Rekindling innovation in the software industry .....	6
The supporting cast of technologies.....	7
How Integrated Software Platforms work .....	9
A 'self-service' services-oriented world .....	12
Serving the long-tail of software applications development.....	12
Business drivers for rapid applications development .....	13
Social operating systems – the final chapter.....	14
Conclusion.....	14
About Encanvas.....	15
Intellectual property.....	16
Contact information .....	16

## Overview



The invention of the transistor sparked a wave of innovation in the very large scale integration (VLSI) of electronics. Its development led to the microprocessor and invoked a burst of innovation in computing and electronics that has since transformed our society. The software industry it spawned is now facing a similar pace of innovation through the emergence of the Integrated Software Platform. This paper outlines what the innovation is and why it's likely to have such a significant impact on society and business.

### **The birth of Silicon Valley**

Before the micro-chip, Silicon Valley was a sparsely populated expanse of desert in the San Francisco Bay Area that few people visited by choice. The area now itself resembles a micro-chip with its road grid connecting vast square white and grey factory units. Today it is the world's leading high-tech hub attracting the most potent minds and brightest entrepreneurial talents the world has to offer - but it owes much of its success to the Very Large Scale Integration of electronics.

When the transistor appeared in the 1950's it enabled scientists and engineers to envision new ways of reducing the size and manufacturing complexity of integrated circuits. This new technical component of electronic circuits was cheaper, smaller and more reliable than the values it replaced. Not only did the transistor simplify mass production of electronic products, it also meant that those products it contributed towards could be smaller, more efficient and lower cost. The micro-chip (production of integrated circuit boards on a sliver of silicon) took VLSI another step and the idea of programmable micro-chips (the 'micro-processor') soon followed in its wake.

## New era, new challenges

Whereas the 1950's, 1960's and 1970's were the golden age of electronics, the 2000's is the golden age of software. Many of the brightest minds of the 21<sup>st</sup> century aren't playing with electrical currents anymore, they're developing software applications, discovering new ways to harness the potential of an unimaginable micro processing powerhouse found in cloud computing – a seemingly endless supply of processing power. Like the 'valve' that held back electronics innovation, the software industry has struggled with its own demons.

"Creating applications has always required the use of a mix of different design tools and design skills that have meant IT projects are expensive and often over-run."

The two major challenges have been:

1. How to create applications without requiring a bagful of development tools and skilled IT people
2. How to scale the deployed applications so that 'n'-number of unique experiences can be created

### Creating software applications

Developing applications has always required the use of a mix of different design tools and design skills that have meant IT projects are expensive and frequently over-run. Chasms form between business stakeholders and IT experts as programmers grapple with 'best guess' design briefs while users and purchasers wonder what level of technology will emerge from the back-room that is the coders layer. Overcoming the problem of programming has been fraught with challenges. These are just a few of them:

Design	Like any design process, creating a software application means that inevitably mistakes will be made, scope creep will occur and iterations of the final solution will take place over time, with each change becoming increasingly expensive.
Databases	Most computing solutions involve the use of databases to manage content. Knowledge of how databases work is beyond the skills of most people today and so even with the simplest of design tools, IT systems architects are still required to design the databases hiding behind modern, easy on the eye portals.
Protocols	The tools that software programmers use are far from uniform. In the absence of monopoly, formation of industry standards demands the dominance of a competitive player or the awkward cooperation of a community of suppliers to hammer home standards across technology platforms that make innovation possible.
Integration	Computer users have built up masses of data over the past 50 years and this data is often held in proprietary systems, often poorly understood. Tapping into these resources is made difficult not only through technical complexity, but also due to concerns over data security breaches and of political resistance coming from the leaders of operational silos who associate the retention of knowledge with boardroom power.

"Knowledge of how databases work is beyond the skills of most people today."

- Deployment      The creation of application is only part of the story. Few people today have the knowledge to publish and operate web sites by themselves. They require IT specialists to orchestrate their platforms, create secure portal spaces and manage security.
- Belief systems      Huge numbers of project failures in the computing industry have built up enormous scepticism that new innovations are unlikely to work and are unlikely to solve problems that have existed for many years.

#### Scaling portal platforms

Already, social networking platforms like Facebook show how the future of computing demands many thousands of unique portal experiences and the ability to share across them. Admittedly, in the business world, the concept of sharing is very different as intellectual property and personally identifiable information must be appropriately protected while project-based activities require the contributions of participants to be monitored and outcomes established. So how can software development hope to keep up with demand if it continues to require the use of many different complex tools and skills to serve it? The answer has to be found through new forms of software authoring and publishing platform that deskill the task of authoring and closes the gap between the users and developers – putting them both on the same page to design applications in real-time within an environment that supports the iteration of design without the burden of cost and risk associated with traditional platforms.

But the scaling of software portal platforms is not exclusively a software issue. Many of the challenges relate to how computing platform can support multi-tenant environments where user accounts and the applications they use can share pooled processing, memory and storage resources. Cloud computing is an emerging computing model that describes the virtualization of computing away from in-house computing platforms to shared serviced facilities that offer multi-tenancy – sharing processing power, bandwidth, memory and storage. Users access their preferred portfolio of information services from anywhere, through any connected device that uses an Internet browser. A Winterthur report suggests Cloud computing markets at \$36 billion 2008 are expected to reach \$160.2 billion by 2015 while IDC suggests 1/3<sup>rd</sup> of all new IT investment will go into cloud-based technologies by 2013. 'The Cloud' offers computing capacity on a scale that emerging social operating systems demand.

".. platforms like Facebook show how the future of computing demands many thousands of unique portal experiences and the ability to share across them."

## Rekindling innovation in the software industry

An Integrated Software Platform facilitates the design, deployment and operational management of software applications from a single integrated software platform that requires the minimum of computing literacy to discharge all aspects of management over the life-cycle of applications.

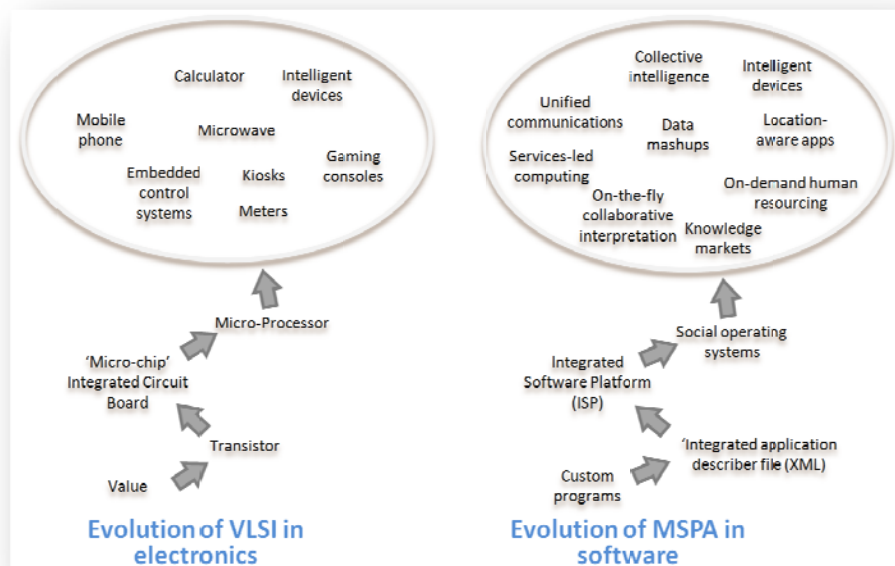
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What makes the ISP different from traditional computing platforms is the ability to support massively scaling portal architectures, where applications can be designed by users themselves and many hundreds, if not thousands, of portal sites can be created without a comparable growth in IT.

The Integrated Software Platform microizes the production and management of software applications and their deployment environment. It simplifies mass production of software applications and means coding overheads are substantially smaller, making production of software applications more efficient and lower cost.

It could be argued that the journey towards massively scaling portal architectures (MSPA) is closely following the evolutionary path of very large scale integration in the electronics industry. This is outlined in the illustration below.

### Comparison between the evolutionary paths of the electronics and software industries



The 'transistor' equivalent in the software industry is the **integrated describer file**; a data file that is able to describe every aspect of a software application, its user interface components, its logic, the data it consumes and its properties. The first examples of integrated describer files came from JustSystems Corp and Encanvas Inc. in the early 2000's and enabled organizations to rapidly design new applications and human-centric workflows by creating a single XML structure using point-and-click software design tools.

The innovation that followed was to create a system whereby describer files could be painlessly published to cloud computing platforms, orchestrating both the deployment and operational management of web portals without the need for IT professionals to actively play a role in applications design.

But the path of innovation is still progressing and many industry analysts now believe that the final step of this journey will be the creation of social operating systems that will expose social networks to these self-service portal design tools leading to a spark in software production that will result in many new forms of information service.

### **The supporting cast of technologies**

A collection of technology innovations has made this step-change in computing possible and we summarize some of the more influential contributors here.

#### **XML**

XML (Extensible Markup Language) enables data about data to be included in a file necessary for encoding content electronically. XML-based files enable machine to machine transfer of information but they also facilitate process step to process step transfer. The Integrated Software Platform uses XML-based files to describe software applications to deployment platforms, carrying a series of 'blocks' of code in a single container so they can be interpreted, transformed and loaded to the consuming web portal architecture.

#### **AJAX**

Web portals have since their inception been constrained by the limits of HTML programming. As any component on a web page changes, the entire page of data is refreshed requiring large volumes of data to be republished. The consequence of this is that web pages have traditionally been inferior in their user interfacing and presentation of content when compared to desktop embedded applications. But AJAX changes this. AJAX (Asynchronous JavaScript plus XML) is a group of interrelated web development techniques that enables components of a web page to be refreshed asynchronously without requiring the entire page to be updated. This innovation has allowed applications design tools to offer richer interfaces with higher refresh performance and much greater uniformity across browsers.

#### **Microsoft® operating systems**

The unparalleled influence of the Microsoft Corporation in the computer industry has served to create a defacto standard platform for applications development that touches the majority (over 80%) of users around the world. Innovations by Microsoft® in Internet services and operating systems has put within reach for software companies the ability to develop Integrated Software Platforms that large communities of users can instantly access.

"The Integrated Software Platform uses XML-based files to describe software applications to deployment platforms".

#### Mobile communications

Today, according to the UN, there are over 4 billion mobile subscriptions; on average 60 mobile phone subscriptions to every 100 people in the world. The rise and rise of mobile technologies is giving more people around the world access to always on Internet. The mobile phone has become the world's most successful computing platform and promises to continue a major role in the future of computing. Access to the Internet brings with it the potential for millions of people to become part of digital social networks and become the consumers of applications created using Integrated Software Platforms that do not require any client applications components installation.

#### Services oriented computing and data mashups

Until the last decade it hasn't been possible to acquire data from disparate sources and 'mash' it together in new applications so that information can be re-used for different people for different reasons. Instead of having to create custom connections (and many of them) to core data repositories, services-oriented architecture describes an approach where web services are created that uniformly take data from one system and post it in a way that it can be consumed by applications created using point-and-click 'mashup' design tools. The market for SOA software and services is expected to reach \$17.7 billion by 2011. Market growth comes because SOA enables the flexible IT architecture that is needed to respond to market shifts brought by speeded product cycles and competitive challenges.

#### Social networking

150 million people around the world are now actively using Facebook and almost half of them are using Facebook every day: serving 300 million unique experiences with people spending 8 billion minutes a day and sharing over 2 billion pieces of content. Social networking has moved on from being a popular pastime and is now seen as a vehicle to grow social capital, expose personal opportunities for advancement, increase the usefulness of collaboration and drive business results. Social networking is no longer just social. Businesses too are exploring how social networks can realize the potential of people, reach out to new prospects and deepen relationship ties with customers and suppliers. It is the Social Operating System that supports these activities that is progressively driving demand for massively scaling portal architectures.

**Without the technologies listed here, Integrated Software Platforms could not have existed and would not have found their niche.**

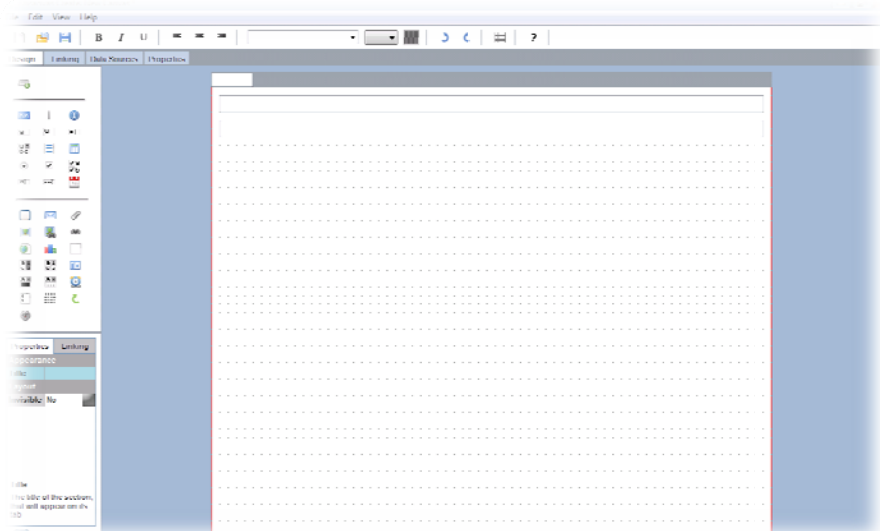
## How Integrated Software Platforms work

The first deployable Integrated Software Platform was created by Encanvas Inc. and this section describes its architectural components, though bigger players Google and Facebook are thought to be working on similar technologies.

**Step 1. An XML-based integrated application describer file is created.**

Encanvas Create design studio is the desktop point-and-click application used to create 'canvases' (Encanvas's XML-based describer file format). The canvas is authored using four closely coupled design layers. The first layer is the Design layer where the application UI is created using point-and-click tools and pre-built application components (called design elements). Then logic links are formed between onscreen components using drag-and-drop functionality of the Linking layer. Data is gathered from existing sources or a new data source is created using the Data Sources layer. Finally the Properties layer is used to simplify the creation of meta-information about the canvas – who designed it, what version, help notes etc.

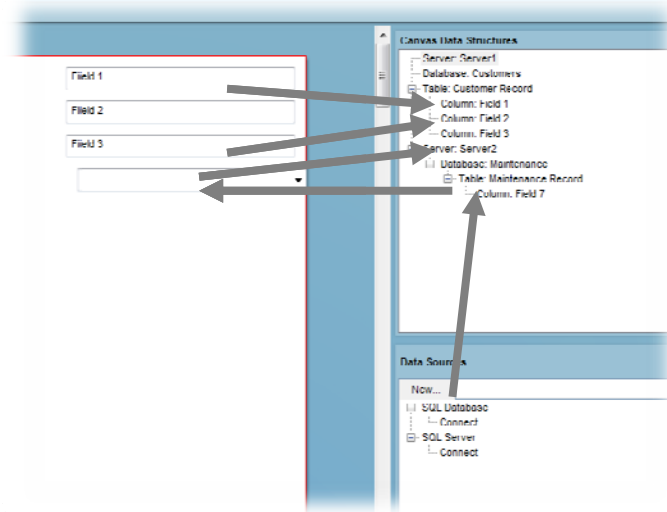
**Illustration of Encanvas Create design studio**



### Data mashups

A key ingredient of Integrated Software Platforms is their ability to humanize IT and make it possible for non technical people to author applications. Perhaps the most complex aspect of IT for most people is how to design and operate databases. Whilst ISP solutions don't eradicate the need for IT knowledge they do significantly reduce demands for IT skills. Encanvas Secure&Live™ is an example of ISP where multiple sources of data can be bound together using simple drag-and-drop tools and new data structures that can be created by people with a lower level of computing competency. Gathering data is made easy by upload and flow automation tools that create connections to offline systems using scheduled events and data transformations.

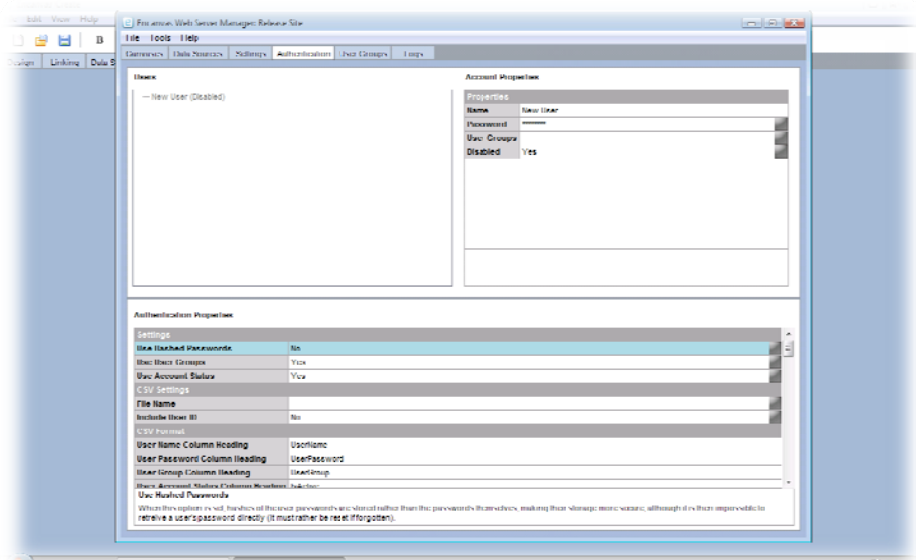
## Illustration of data mashup environment



### Step 2. Applications are deployed

Encanvas Web Server Manager™ is the publishing component that takes the integrated applications descriptor file ('canvas') and orchestrates its publication to the Internet service platform; which in the case of Encanvas in Microsoft® IIS.

### Encanvas Web Server Manager™ orchestrates the publishing of applications



The publishing environment removes the complexity of publishing applications to web portal spaces. It enables administrators to take complete 'remote' control over their cloud deployment environment without having to use a combination of administrative tools. Every aspect of site configuration (i.e. User identity and access control, integration with data sources, site presentation, settings, authentication, user groups, languages and log file management) is managed from a single administrative dashboard that doesn't require any coding or scripting knowledge.

### Security

Security of sites is a major concern to users and business organizations. Integrated Software Platforms overcome security concerns by adopting an inclusive security model that manages and monitors systems, data governance, identity management and intellectual property protection. The advantage of ISP technology in this case lies in its ability to holistically manage all interactions between data sources, portals and users (and user groups) which means that more robust security protocols can be enforced. This differs to traditional enterprise systems that rely on many disparate components to work together to deliver a robust security solution. ISPs like Encanvas Secure&Live™ provide a 4-tier inclusive security architecture comprising of:

1. **Systems, message and network security** – including SSL, protection from canonicalization attacks, cross site scripting, SQL injection attacks and session impersonations.
2. **User identity management and access control** - including integration with Single Sign On, LDAP/Active Directory etc.
3. **Data governance** – installing a data governance regime and preventing access to data from unauthorized users and exposing high threat areas.
4. **Rights management** – installing document policies and protection of intellectual property.

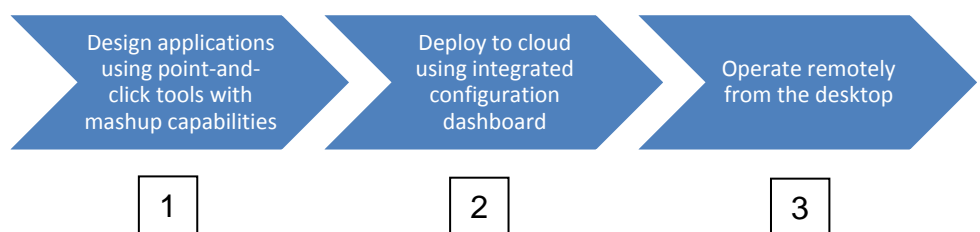
### Deploying to the cloud

The Web Server Manager may be configured to automatically publish the web portal sites it creates to dedicated customer spaces on cloud computing platforms such as Microsoft® Azure. In such cases the process of deploying applications is fully automated.

### Step 3. Operation

Operation of deployed applications is placed more in the hands of users and user groups through Social Operating Systems. Emerging Social Operating Systems enable users to add their own information services and applications to secure workspaces. It is in these virtual workspace environments that many of the applications are consumed. Applications developed using Encanvas Secure&Live™ are maintained using Web Server Manager. No further software tools are required.

#### Simple cloud publishing process for software applications



## **A 'self-service' services-oriented world**

User perceptions of software 'value' are changing rapidly. The belief that only skilled IT people have the ability to serve applications is decaying. All major vendors competing for the prize of becoming a social operating system – Apple, Google, Facebook – are including App Stores as part of their platforms. ISP technologies make the creation and re-use of applications accessible to a much broader community of people. And young people are far more adept at applying technology. They do not see the distinction between applications and information services they consume online like Googlemaps, Flickr, YouTube and Facebook. All software products today must take on the mantra of 'just work' without the need for thick user manuals or training courses. Those products that lack this level of intuitive usability simply become uncompetitive; displaced by information services provided by more adept providers.

This self-service world demands that users have more capacity to access and re-use information services tailored to the needs of their communities and social networks. Widgets are a simple form of consumable application component that provides this type of capability, but Widgets are very limiting in terms of computing possibilities. ISPs on the other hand provide almost limitless possibilities for authoring both simple and sophisticated applications. It's still unlikely however that users will want to create their own applications from scratch; far more likely that they will consume applications that have already been authored, or mash information services together to create new ways of using and consuming information.

## **Serving the long-tail of software applications development**

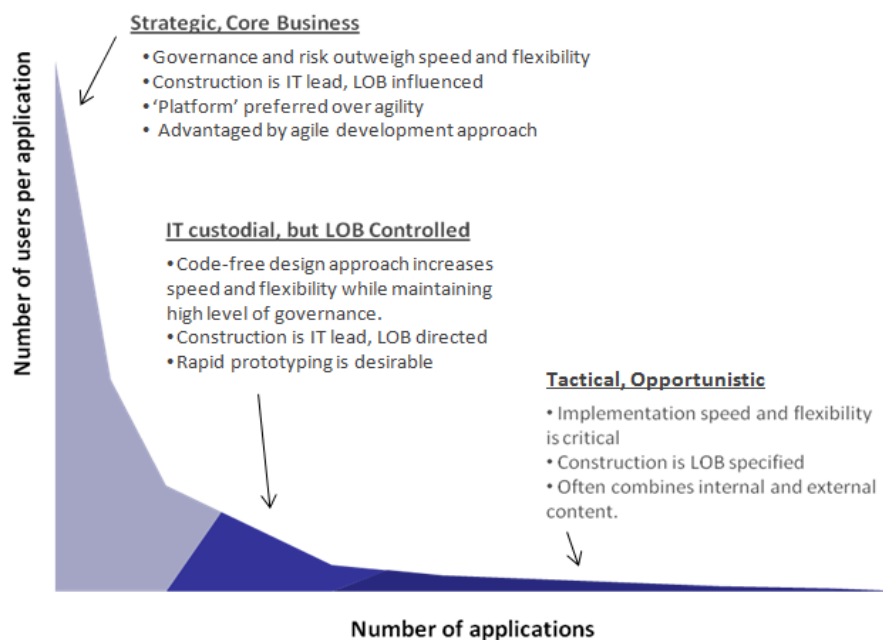
The progression towards self-service computing is one reason why organizations are taking see-no-code authoring seriously but there are also strong business drivers. Attempts to automate every business critical process over the last 30-years have driven an avalanche of business software applications purchases and left many organizations with 'spaghetti systems' that hinder the re-use of information held in back-office systems.

On one level the need for affordable applications development (that promises lower risk and lower IT resourcing overheads) is attractive, yet many IT functions today have become progressively risk averse due to the years of software providers and products not delivering the value to business that they promise, so any new technology is treated with scepticism and has to have a compelling value benefit in order for it to be considered.

Resource constrained IT leaders find burgeoning requirements for compliance, security, system upgrades, platform support, customer support and administration are consuming their budget well before the opportunity for innovation and new ways to bring customer value are considered. Day-to-day

'vanilla' IT is leaving scant time, budget or resources to the delivery of competitive advantage. What organizational leaders know is that the information access to key pockets of innovators and thinkers in the enterprise are poorly served. Whilst the majority of users are happily benefiting from the large back-office systems they use, it is the creative teams that are suffering: a much smaller community of people who demand many more applications to serve their business needs. The argument for more aligned IT investment planning (striking a better balance between budget and value) is bringing focus to 'long-tail of demand' for software applications - that isn't being serviced.

**The long-tail of applications; a driver for service-oriented architectures**



**Business drivers for rapid applications development**

It may be business leaders, not IT leaders, who will insist on a fundamental attitude change towards IT focusing on 'doing better things' rather than 'doing things better'. Globalization and hyper-competitive markets are causing business leaders to re-evaluate their business plans every year (as opposed to every 5 or 10 years).

As strategies make their influence on the structure and behavior of the enterprise, so IT must perpetually re-discover its purpose as an innovation engine and competitive enabler to serve up new information services and new tools to enable information workers to discharge their roles.

## **Social operating systems – the final chapter**

The innovation journey that began with the integrated software describer file has not ended yet. The IT industry may now have its equivalent to the 'transistor' and the 'micro-chip' but it has yet to have its equivalent to the 'microprocessor'. Even sophisticated platforms like Encanvas Secure&Live™ do not offer the programmability of the enterprise systems they are expected to replace. However, this transformation is unlikely to be a 'like-for-like' replacement of technology that has come before. Today we are seeing the emergence of Social Operating Systems; environments that support the formation and

Social Operating Systems operate in significantly different ways to traditional systems. They place their focus on the creation and management of a 'people network' and provide the tools to enable each participant to contribute and share their opinions and perspectives. Users are able to tag their conversations, what they think about the people they're socializing with, the content they share (etc.) and this creates a much richer collective intelligence. In such systems, relevant content FINDS the user (or user group) by using meta-information captured through relationship analysis and tagging of content to distil the most relevant content.

App Stores are becoming a popular means of giving users access to pre-built applications that users can share – and the Integrated Software Platform becomes a key platform empowering software creators to unleash their products to Social Operating Systems without requiring large programming teams.

## **Conclusion**

The Integrated Software Platform introduces new possibilities for innovation and endeavour in software engineering and arrives at a time when new socially-based networks and scaling of computing platforms are redefining how people consume business applications. What remains to be seen is which economies around the world will embrace this new paradigm in the software industry and what impact it will have on traditional software companies.

## About Encanvas

Encanvas<sup>®</sup> software makes the workplace work better.

We bring added value to the Microsoft<sup>®</sup> enterprise platform by creating the technologies organizations need to spend less and receive more from their software investments.

We've created the world's first Integrated Software Platform; digital equivalent of the micro-chip. Our Secure&Live<sup>™</sup> platform enables the design, deployment and operation of applications without coding or scripting all made possible by a single tightly coupled architecture. It facilitates the massive scaling of portal architectures; so users can communicate, share information and their applications in real-time while operating in 'secure spaces' that protect systems, data, identity and intellectual property.

Similar to the influence of the micro-chip in electronics, our integrated software platform is creating a mushroom of innovation around the world as individuals and organizations realize they now have the tools to design and publish right-first-time software applications to cloud computing platforms at very low cost and risk – serving the long-tail of business applications needs.

Encanvas also creates Social Operating Systems (see Encanvas Squork<sup>™</sup>). In the digital era a network is a group of people tied by relationships, not a set of computer systems strung together by wires. User-centric computing enables web workers to 'work efficiently anywhere' while organizations can achieve a step-change in productivity by harnessing the enthusiasm, skills and collective intelligence of social networks.

## **Intellectual property**

All information of whatever kind and which is contained in any documentation, drawings, specifications, diagrams, plans, notes, data, patterns, models, samples, software, software applications, computer outputs or other materials or records or other information whether written or oral of a business, financial or technical nature which is marked or otherwise indicated or known to be of a confidential or proprietary nature shall be called for the purposes of this project 'Confidential Information' and remains the property of Encanvas Inc.

Encanvas Inc.'s appointed data controller is Mr Nick Lawrie. Further information is available on request.

## **Contact information**

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