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Technology Institute

PwC Global 100 Software Leaders

Digital intelligence conquers the world below and the cloud above

100 Global Software Leaders

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Executive summary

The new PwC Global 100 Software Leaders ranking reveals who is taking advantage of both the evolutionary and revolutionary changes afoot in technology. While the cloud continues to underpin massive change, other trends are building on its capabilities to create opportunities in digital innovation, industrial capabilities and convergence within vertical markets. This initial article provides an overview of the trends impacting the global leaders and others. Future articles will examine issues impacting the fastest growing cloud-based companies and the larger software companies in emerging markets.

Introduction

We are in an era of innovation that seems to have no precedent. Concurrent advances in software development, mobility, connectivity and analytics have combined to create a landscape in which ideas arise, and flourish quickly. The underlying foundation to this innovation is software—smarter, leaner and better software.

The new edition of the PwC Global 100 Software Leaders ranking reveals the vendors who are taking advantage of both the evolutionary and revolutionary changes afoot in technology. While the cloud continues to underpin massive change, other trends are building on its capabilities to create opportunities in digital innovation, industrial capabilities and convergence within vertical markets.

The spoils go to anyone whose code represents an improvement. As a result, startup vendors are challenging established software companies, sometimes with significantly better ideas. The PwC Global 100 Software Leaders list contains examples of this. Cloud-based Workday, which appears on the Global 100 for the first time at #72, is challenging existing companies in the human-resources space. Splunk, a startup focused on big-data analytics debuting at #100, is challenging established firms in similar areas.

Customers are seeing rampant changes as well. Enterprises have the opportunity to take advantage of various new deployment options, not only from startups, but also from established vendors. The spectrum of options encompasses everything from private to public cloud, from onsite to offsite hosting and from perpetual licenses to month-to-month subscriptions.

The partnership landscape also percolates. Consider General Motors partnering with Lyft for what might be driverless cars, or Roche partnering with Qualcomm to improve remote monitoring of patients with chronic diseases. For companies seeking to use software—either their own or someone else's—for a competitive advantage, the choices may be overwhelming.

This is the fourth edition of PwC's Global 100 Software Leaders ranking since 2010. The current edition continues our tradition of monitoring and analysing the leading companies and trends in the industry. Our goal is to help our clients understand both the obvious and the underlying forces influencing the software industry.

Thanks to software, we are not only living in a time of unprecedented innovation, but also one of unprecedented opportunity and uncertainty.

Our research yields four key findings:

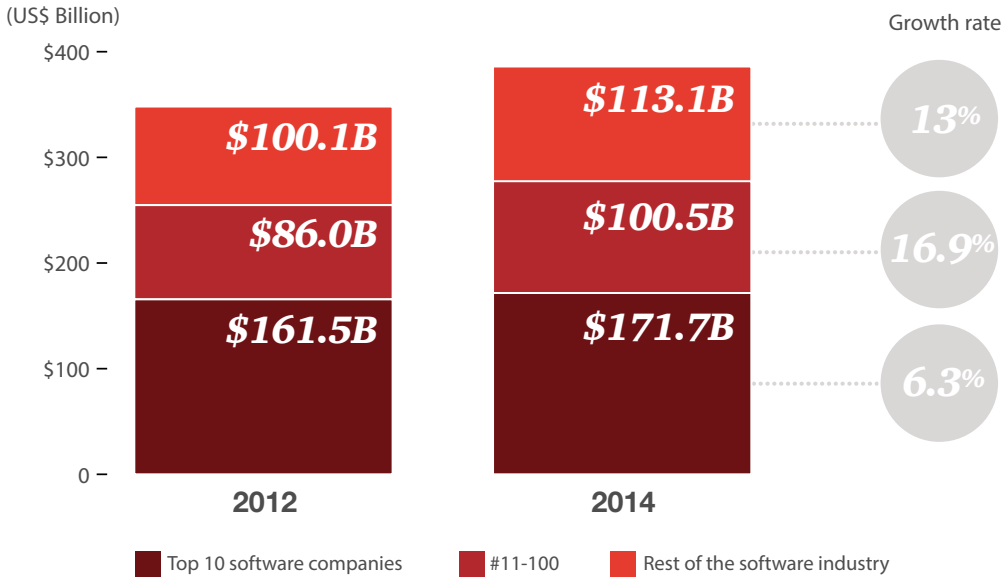
- The software industry is experiencing a rapid expansion of its total addressable market (TAM) and a high level of turbulence.
- Cloud adoption is creating new software-as-a-service (SaaS)-based business models.
- The move to SaaS significantly impacts the revenue of traditional vendors.
- Connected devices and artificial intelligence (AI) are creating new business opportunities.

Global 100 Software Leaders

Analysing the changes between the current Global 100 Software Leaders and the previous ranking, published in 2014, indicates just how dynamic the market is. Both lists were compiled for PwC by International Data Corp. (IDC). (For more information on how the lists are compiled, see the Methodology section on page 20.) Fourteen companies fell off the current list, which means 14 are new. A churn of 28 seems like quite a bit in just two years. Four of the 14 companies that fell off the list were acquired, and one (Compuware) split into two companies. Actually, it's fairly easy to fall off the list. Of the bottom 12 in the previous list, 10 are gone.

Growth and innovation continue apace

The Global 100 Software Leaders' revenues grew from US$247.5 billion in 2012 to US$$272.2 billion in 2014, a 10% increase. Meanwhile, the rest of the industry grew 13% amidst a relatively weak global economy.



Source: PwC's Global 100 Software Leaders report with data provided by IDC.

"Several companies couldn't keep up their growth and as a result fell off the list," says Mark McCaffrey, PwC Global Software Leader, "There are others that are large enough to survive because they have the cash and the wherewithal to acquire cloud companies."

Many companies show staying power: Microsoft remains at #1, while Oracle and IBM have swapped as #2 and #3, with Oracle edging out IBM. Other companies in the top 20 from the previous list have moved up:

- Symantec, up one position to #5;
- EMC, up two at #6;
- Salesforce, up four to #9
- Intuit, up six to #10.

A couple of big jumps are worth mentioning: Google leaped from #52 to #20, while Dell jumped from #64 to #36. (See table on pages 6-9)

Moving in the other direction in the top 20:

- HP, down one position at #8;
- CA Technologies, down two at #12;
- Adobe, down two at #11.

"Many factors affect downward movement," says Raman Chitkara, PwC Global Technology Leader. "These include the ongoing shift from a licensing to a SaaS business model, competition from startups and the challenge of digitisation. In some cases, a lack of agility when it comes to executing organisational change could be the issue."

Some companies are clearly taking advantage of the SaaS revolution. The current Global 100 Software Leaders also ranks SaaS and platform-as-a-service (PaaS) revenue for the top 50 companies, and the percentage each segment comprises of overall software revenue. The companies with the biggest jump in the combined percentage represent a small group that is on the cutting edge.

Among the top 20 companies the list of SaaS standouts includes:

- Intuit (#10) with 46% of revenues from SaaS;
- Adobe (#11) with 23% of revenues;
- Cisco Systems (#14) with 35%;
- Citrix (#19) with 27%.

These are indications of companies that understand the changes underway. (See table on pages 12-13)

Some companies are clearly taking advantage of the SaaS revolution.

Global 100

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	Software revenue as % of total
1	Microsoft	USA	$62,014	$93,456	66.4%
2	Oracle	USA	$29,881	$38,828	77.0%
3	IBM	USA	$29,286	$92,793	31.6%
4	SAP	Germany	$18,777	$23,289	80.6%
5	Symantec	USA	$6,138	$6,615	92.8%
6	EMC	USA	$5,844	$24,439	23.9%
7	VMware	USA	$5,520	$6,035	91.5%
8	Hewlett Packard	USA	$5,082	$110,577	4.6%
9	Salesforce.com	USA	$4,820	$5,274	91.4%
10	Intuit	USA	$4,324	$4,573	94.6%
11	Adobe	USA	$4,061	$4,183.5	97.1%
12	CA Technologies	USA	$4,053	$4,410	91.9%
13	SAS*	USA	$2,884	$3,084	93.5%
14	Cisco Systems	USA	$2,836	$47,823	5.9%
15	Dassault Systèmes	France	$2,695	$3,038	88.7%
16	Siemens	Germany	$2,613	$95,542	2.7%
17	Fujitsu	Japan	$2,527	$43,526	5.8%
18	Autodesk	USA	$2,413	$2,486	97.1%
19	Citrix	USA	$2,376	$3,143	75.6%
20	Google	USA	$2,273	$66,001	3.4%
21	Hitachi	Japan	$2,159	$91,246	2.4%
22	Apple	USA	$2,110	$199,800	1.1%
23	Infor	USA	$2,099	$2,815	74.6%
24	Synopsys	USA	$1,934	$2,100	92.1%
25	Intel	USA	$1,899	$55,870	3.4%

*Denotes a privately held company

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	Software revenue as % of total
26	BMC	USA	$1,878	$2,087	90.0%
27	Sage	UK	$1,724	$1,762	97.8%
28	ADP	USA	$1,660	$10,604	15.7%
29	Wolters Kluwer	The Netherlands	$1,539	$4,880	31.5%
30	Red Hat	USA	$1,517	$1,741	87.1%
31	OpenText	Canada	$1,496	$1,858	80.5%
32	SunGard*	USA	$1,464	$2,808	52.1%
33	NEC	Japan	$1,441	$28,151	5.1%
34	Cadence Design Systems	USA	$1,435	$1,579	90.9%
35	Hexagon	UK	$1,413	$3,497	40.4%
36	Dell	USA	$1,395	$58,500	2.4%
37	Teradata	USA	$1,221	$2,732	44.7%
38	NetApp	USA	$1,169	$6,252	18.7%
39	NCR	USA	$1,157	$6,591	17.6%
40	Epic Systems*	USA	$1,140	$1,770	64.4%
41	Constellation Software	Canada	$1,134	$1,230	92.2%
42	McKesson	USA	$1,123	$168,711	0.7%
43	Mentor Graphics	USA	$1,076	$1,231	87.4%
44	PTC	USA	$1,073	$1,358	79.1%
45	Trend Micro	Japan	$1,035	$1,090	95.0%
46	Nuance Communications	USA	$1,009	$1,927	52.3%
47	DATEV*	Germany	$975	$1,119	87.1%
48	Esri*	USA	$960	$1,129	85.0%
49	Cerner	USA	$946	$3,402	27.8%
50	ANSYS	USA	$917	$936	98.0%

*Denotes a privately held company

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	Software revenue as % of total
51	Informatica	USA	$914	$1,048	87.2%
52	TIBCO*	USA	$847	$1,016	83.4%
53	Software AG	Germany	$843	$1,138	74.1%
54	Optum*	USA	$819	$47,746	1.7%
55	Schneider Electric	France	$804	$33,252	2.4%
56	Fiserv	USA	$781	$5,066	15.4%
57	Avaya	USA	$766	$4,319	17.7%
58	Kronos*	USA	$762	$1,054	72.3%
59	The Attachmate Group*	USA	$733	$872	84.1%
60	GE Healthcare	UK	$732	$18,300	4.0%
61	Epicor Software	USA	$731	$994	73.5%
62	Verint Systems	USA	$725	$1,110	65.3%
63	Concur Technologies	USA	$724	$732	99.0%
64	athenahealth	USA	$711	$753	94.5%
65	Kaspersky Lab*	Russia	$695	$711	97.7%
66	Wincor Nixdorf	Germany	$666	$3,279	20.3%
67	FICO	USA	$643	$794	81.0%
68	FIS	USA	$633	$6,400	9.9%
69	Misys*	UK	$611	$896	68.2%
70	JDA Software*	USA	$605	$1,009	60.0%
71	SWIFT	Belgium	$602	$792	76.0%
72	Workday	USA	$592	$760	77.9%
73	Genesys Telecommunications Laboratories*	USA	$587	$850	69.0%
74	TOTVS	Brazil	$584	$752	77.7%
75	NICE SYSTEMS	Israel	$576	$1,012	56.9%

*Denotes a privately held company

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	Software revenue as % of total
76	ServiceNow	USA	$569	$683	83.4%
77	CommVault	USA	$565	$614	92.0%
78	Bentley Systems*	USA	$532	$625	85.1%
79	Convergys	USA	$528	$2,856	18.5%
80	Neusoft	China	$508	$1,269	40.0%
81	Visma	Norway	$507	$1,129	44.9%
82	Qlik	USA	$503	$503	100.0%
83	Micro Focus	UK	$502	$519	96.7%
84	ACI Worldwide	USA	$489	$1,016	48.2%
85	InterSystems*	USA	$489	$489	100.0%
86	Palantir*	USA	$484	$569	85.0%
87	Unit4	The Netherlands	$480	$696	68.9%
88	Allscripts	USA	$477	$1,377	34.6%
89	MEDITECH	USA	$476	$517	92.0%
90	Blackboard*	USA	$467	$660	70.7%
91	Amazon.com	USA	$466	$88,988	0.5%
92	Micros Systems	USA	$464	$904	51.3%
93	Pegasystems	USA	$449	$590	76.1%
94	NetSuite	USA	$449	$556	80.6%
95	MicroStrategy	USA	$447	$580	77.1%
96	ESET*	Slovakia	$437	$486	90.0%
97	Pitney Bowes	USA	$430	$3,822	11.2%
98	SolarWinds	USA	$428	$428	100.0%
99	Ultimate Software	USA	$420	$506	83.0%
100	Splunk	USA	$404	$435	92.9%

*Denotes a privately held company

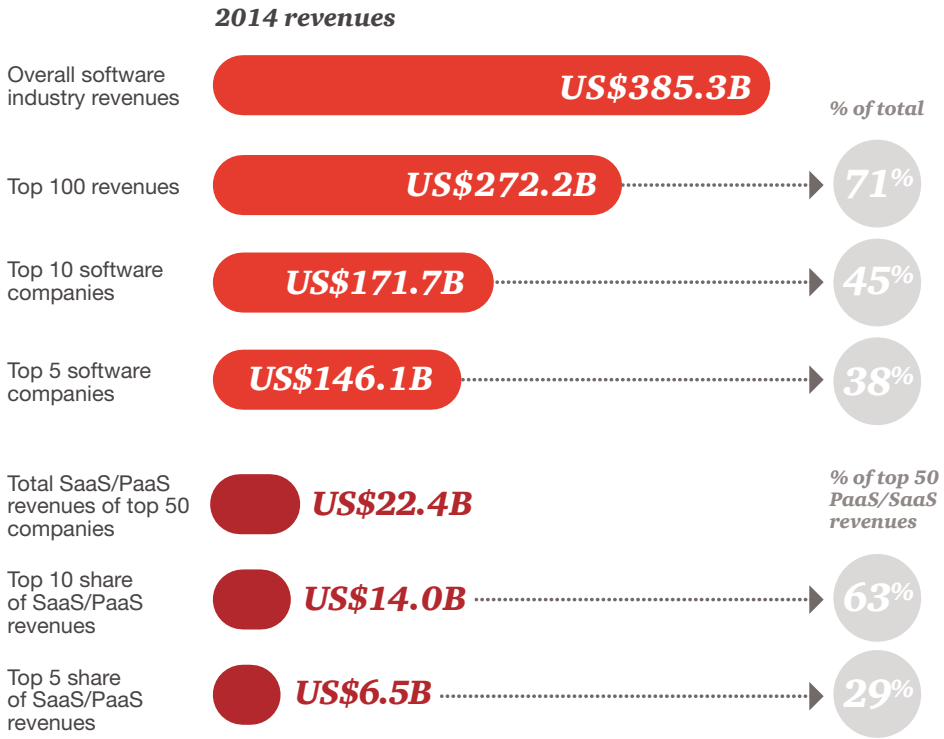
Evolution vs. revolution

As we look to the future, PwC sees an industry experiencing a high level of turbulence. On the one hand, we see a lot of evolution. The trends we identified in previous analyses of the software industry continue. The cloud, in the form of SaaS, PaaS or infrastructure-as-a-service (IaaS), is becoming increasingly popular as enterprises recognise the flexibility it brings to applications and other deployments. Its adoption is creating new SaaS-based business models.

Subscription-based deployments are increasingly replacing software licensing, which significantly impacts the revenue streams of traditional vendors. Amy Konary, IDC Programme Vice President for SaaS, Business Models and Mobile Enterprise Apps, deems 2016 an "inflection point" in the relationship between software subscriptions and licenses. According to IDC calculations, subscriptions will grow 20% and licensing will decrease 1.7% in 2016. One only has to look at Adobe's 2013 change in strategy—moving from licensing to subscription sales—for an example of a company making the difficult shift.

Software industry concentration

The top 10 global software companies generated almost half of the entire industry's revenues. The top 5 lag in cloud-based revenues.



Source: PwC's Global 100 Software Leaders report with data provided by IDC.

The ubiquity of anytime, anywhere mobile access continues to demand higher system availability and reliability, and the resulting need for wireless connectivity underscores ongoing concerns about security.

There is also a revolution underway in software, characterised by the idea of convergence. This creates new business model opportunities. With digital technology infusing so many industries and launching so many innovations, we're seeing the dawn of what we call 'software & [fill in the industry].' In whatever industry companies participate there is an overwhelming presence of intelligent software. Companies like Boeing and General Electric (GE) beg the question: what defines a software company? (See the sidebar, "The industrial software dilemma" on page 18)

Think about it: everywhere you look, software is defining what products do, and thus redefining what categories companies fall into. Schneider Electric (#55) specialises in electricity distribution, but it also has launched initiatives in automation and energy management. Two companies not on the list, exercise-device company Fitbit and sports-camera company GoPro, manufacture hardware devices, but their devices rely heavily on software to track usage or disseminate video. GE manufactures everything from jet engines and power equipment to medical devices, and is increasingly infusing those devices with software not only to gather post-sale information but also to extend the relationship with customers through service agreements.

The revolution is especially invasive in new kinds of software companies. Is Uber a software company or a transportation company? It is more accurate to think of it as a ride-sharing platform. Its software provides value to customers who need to track expenses and value to Uber itself in setting costs and monitoring drivers. AirBnB is the first large-scale, high-value hospitality company that has no physical inventory. Does that make it a lodging company or a software company? It is more precise to think of it as a lodging-lodger matching platform.

Within this changing landscape, we have identified **three basic and interwoven trends:**

- **Digital innovation:** Startups and legacy companies alike are competing to provide new capabilities, fueled by low interest rates and globalisation.
- **Industry 4.0:** Together the software-based cloud and hardware-based Internet of Things (IoT) are rewriting the rules of what can be done, and how quickly it can be done.
- **Convergence:** New software capabilities are triggering wholesale transformation of every vertical industry.

SaaS revenues of Top 50 software companies

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	2014 SaaS+PaaS revenue†	SaaS+PaaS % of software	SaaS % of SaaS+PaaS	PaaS % of SaaS+PaaS
1	Microsoft	USA	$62,014	$93,456	$2,292	4%	69%	31%
2	Oracle	USA	$29,881	$38,828	$1,327	4%	98%	2%
3	IBM	USA	$29,286	$92,793	$1,067	4%	81%	19%
4	SAP	Germany	$18,777	$23,289	$1,429	8%	98%	2%
5	Symantec	USA	$6,138	$6,615	$418	7%	100%	0%
6	EMC	USA	$5,844	$24,439	$218	4%	98%	2%
7	VMware	USA	$5,520	$6,035	$64	1%	95%	5%
8	Hewlett Packard	USA	$5,082	$110,577	$408	8%	80%	20%
9	Salesforce.com	USA	$4,820	$5,274	$4,820	100%	86%	14%
10	Intuit	USA	$4,324	$4,573	$1,980	46%	97%	3%
11	Adobe	USA	$4,061	$4,184	$916	23%	100%	0%
12	CA Technologies	USA	$4,053	$4,410	$102	3%	100%	0%
13	SAS*	USA	$2,884	$3,084	$44	2%	30%	70%
14	Cisco Systems	USA	$2,836	$47,823	$1,004	35%	100%	0%
15	Dassault Systèmes	France	$2,695	$3,038	$78	3%	100%	0%
16	Siemens	Germany	$2,613	$95,542	$78	3%	100%	0%
17	Fujitsu	Japan	$2,527	$43,526	$29	1%	100%	0%
18	Autodesk	USA	$2,413	$2,486	$45	2%	100%	0%
19	Citrix	USA	$2,376	$3,143	$652	27%	100%	0%
20	Google	USA	$2,273	$66,001	$1,931	85%	82%	18%
21	Hitachi	Japan	$2,159	$91,246	$4	0%	100%	0%
22	Apple	USA	$2,110	$199,800	$151	7%	100%	0%
23	Infor	USA	$2,099	$2,815	$100	5%	99%	1%
24	Synopsys	USA	$1,934	$2,100	$0	0%	0%	0%
25	Intel	USA	$1,899	$55,870	$280	15%	100%	0%

*Denotes a privately held company

†See page 20 for definitions of SaaS and PaaS revenues

Rank	Company	Country HQ	2014 Software revenue (US$M)	2014 Total revenue (US$M)	2014 SaaS+PaaS revenue†	SaaS+PaaS % of software	SaaS % of SaaS+PaaS	PaaS % of SaaS+PaaS
26	BMC	USA	$1,878	$2,087	$77	4%	100%	0%
27	Sage	UK	$1,724	$1,762	$20	1%	100%	0%
28	ADP	USA	$1,660	$10,604	$1,547	93%	100%	0%
29	Wolters Kluwer	The Netherlands	$1,539	$4,880	$124	8%	100%	0%
30	Red Hat	USA	$1,517	$1,741	$1	0%	0%	100%
31	OpenText	Canada	$1,496	$1,858	$268	18%	0%	100%
32	SunGard*	USA	$1,464	$2,808	$6	0%	100%	0%
33	NEC	Japan	$1,441	$28,151	$13	1%	100%	0%
34	Cadence Design Systems	USA	$1,435	$1,579	$0	0%	0%	0%
35	Hexagon	UK	$1,413	$3,497	$0	0%	0%	0%
36	Dell	USA	$1,395	$58,500	$12	1%	100%	0%
37	Teradata	USA	$1,221	$2,732	$16	1%	47%	53%
38	NetApp	USA	$1,169	$6,252	$0	0%	0%	0%
39	NCR	USA	$1,157	$6,591	$492	43%	100%	0%
40	Epic Systems*	USA	$1,140	$1,770	$0	0%	0%	0%
41	Constellation Software	Canada	$1,134	$1,230	$22	2%	100%	0%
42	McKesson	USA	$1,123	$168,711	$0	0%	0%	0%
43	Mentor Graphics	USA	$1,076	$1,231	$0	0%	0%	0%
44	PTC	USA	$1,073	$1,358	$0	0%	0%	0%
45	Trend Micro	Japan	$1,035	$1,090	$79	8%	100%	0%
46	Nuance Communications	USA	$1,009	$1,927	$0	0%	0%	0%
47	DATEV*	Germany	$975	$1,119	$0	0%	0%	0%
48	Esri*	USA	$960	$1,129	$31	3%	100%	0%
49	Cerner	USA	$946	$3,402	$258	27%	100%	0%
50	ANSYS	USA	$917	$936	$27	3%	100%	0%

*Denotes a privately held company

†See page 20 for definitions of SaaS and PaaS revenues

Key trend #1: Digital innovation

No matter how much the Global 100 churned, the companies on the list face a changing environment. Consider the startup landscape: not only are there a lot of new startups they also represent new levels of dynamic creativity.

Why are there more startups? Part of the answer comes from the unsettled economy. Thanks to equity market jitters, the rate of IPOs is slowing down. Thanks to low interest rates, private equity firms and hedge funds are looking for new options for capital investment, and startups represent a viable path. Nor does the pace seem to be slowing: the city of Paris is spending €200 million on a startup incubator that it hopes will attract as many as 1,000 entrepreneurs from around the world.[1]

These startups are taking advantage of the new world of technology to come up with ideas. Besides applications that take advantage of the sharing economy, like Uber, Lyft and AirBnB, the market is being flooded with everything from digital payment services to health care companies promoting in-home services.

Thanks to expanding industrialisation, innovation can happen anywhere. Thanks to mobility and the cloud, software can be consumed anywhere. But globalisation is a two-edged sword when it comes to innovation. Government regulations, such as the European Union's Safe Harbour rules governing data privacy, still create obstacles. For instance, its initial rules slowed the region's adoption of SaaS applications, and confusion reigns over the implementation of updated rules.

Furthermore, in this burgeoning world of innovation, regional companies in emerging markets also face conflicting conditions. On the one hand, they have an advantage in that they can launch an application addressing a local market need and conform to local regulations. Once they get traction, they can use that success to fend off competition. On the other hand, they have a disadvantage in achieving scalability when it comes time to compete against companies that have launched from larger markets like the US.

Startups face another competitive challenge. Established software companies aren't standing still when it comes to offering cloud-based options to customers. The top four companies on the list all made recent significant cloud acquisitions, from Oracle buying Responsys for its cross-channel marketing software to SAP buying Concur Technologies (#63) for its expense-management software.

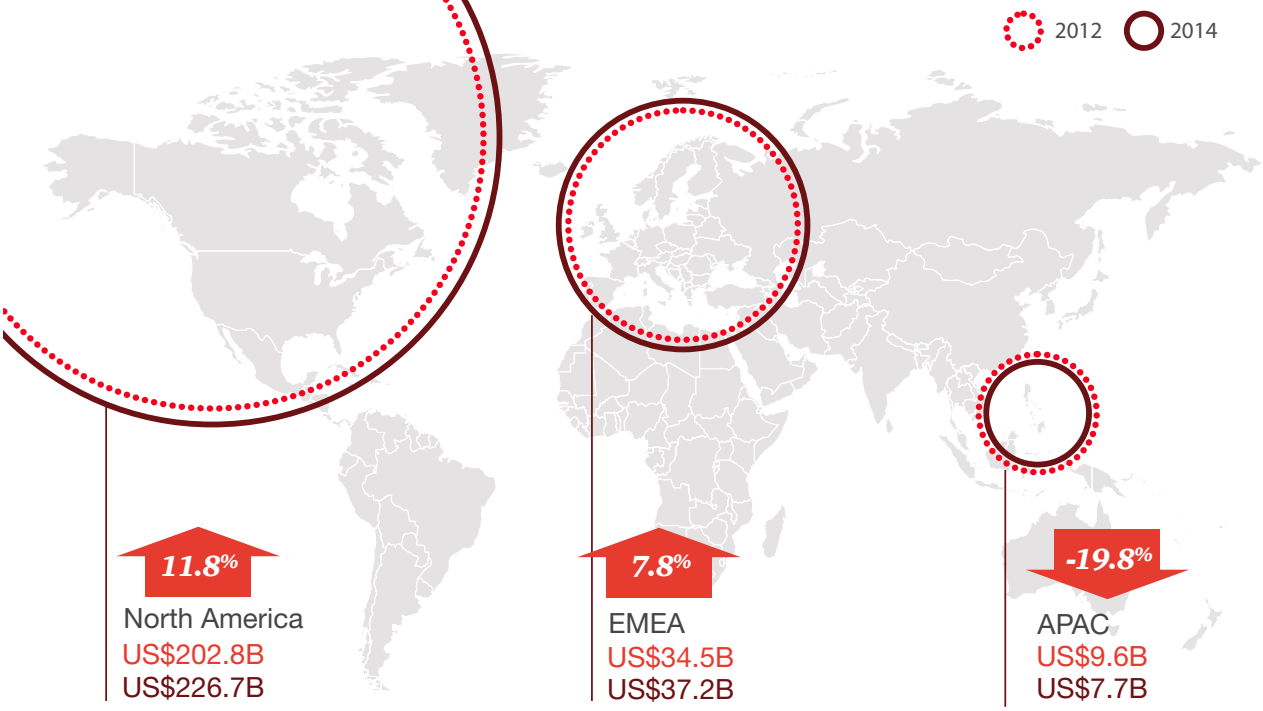
If necessary, they're setting up tech-based subsidiaries to attract new customers and to ease the transition from legacy systems. Barry Jaber, a partner in Strategy Consulting at PwC, notes that this tactic gives established companies a buffer during the transition: "You're not over-exposing to legacy systems while you migrate onto the new platform."

Thanks to expanding industrialisation, innovation can happen anywhere.

1 http://www.theguardian.com/world/2016/jan/12/paris-plans-worlds-largest-startup-incubator-in-former-railway-yard

North American software companies increase industry share of top 100

NA and EMEA software companies grew at 11.8% and 7.8%, respectively, while APAC companies lost ground.



Source: PwC's Global 100 Software Leaders report with data provided by IDC.

Startups and established companies each have distinct advantages. Startups have agility, but their success depends on management, experience and potential, not to mention the ability to execute. As PwC Partner Pierre Marty notes, “Lots of startups are bubbling and lots will die. That’s the rule of the game.” They face established companies that have spent years developing a deep core of trust, resources and customers. That core can make them complacent, unfortunately, so they must also develop agility to survive in this new landscape.

Key trend #2: Industry 4.0

Many trends we've previously identified overlap and intertwine. In a symbiotic way, advances like cloud computing are driving other new capabilities. This is especially true of the IoT: the proliferation of devices, sensors and occasionally remote or mobile objects that automatically transmit information.

Intelligent devices require software, the ability to transmit data, a repository for data and the ability to analyse data. That's the cloud, analytics, connectivity and mobility all in one package.

The cloud, of course, provides the best repository for data, because devices can transmit to nearby clouds, which reduces latency as an issue. Then the various cloud infrastructures can coalesce information at higher speeds.

The cloud also provides high levels of flexibility for enterprises, no matter which permutation of the cloud is adopted. SaaS vendors appreciate the efficiency they get from hosting software, because when it's time to upgrade, they need only change it once in their system, not in each customer's system. Everyone is always using the same version. XaaS vendors take advantage of the cloud to offer middleware that enables integration; this reduces customers' infrastructure spends. At the same time, vendors like Salesforce (#9) and ServiceNow (#76) are creating platforms for greater efficiency and extensibility; these platforms potentially create a whole greater than the sum of its parts, because improvements made by the vendor accrue to the entire ecosystem, not just a single customer. "Because the components within these ecosystems are smaller, the arrangements are more flexible, more organic and less forced," says IDC's Konary. "It makes a level playing field that allows any company to participate."

At the same time, uncertainties remain regarding the cloud. XaaS vendors will need to make the transition from the economics of licensing to subscription models. They will need to maintain security, reliability and availability. Legacy software vendors, comfortable with their position, may have trouble not only moving to the cloud but also maintaining two different software platforms for customers. A strong legacy cash-cow may keep some software vendors from making the leap to the cloud until it's too late, when they see their licensing revenues dropping.

Here's another potential issue: what impact, if any, will gaming have on software development, given its forays into social interaction during playing and its ability to present software in a highly graphical, non-threatening way? The next revolution in software may well be driven by the way software looks and behaves.

The cloud also provides high levels of flexibility for enterprises.

Key trend #3: Convergence

As noted, software is becoming more prevalent in more places, affecting the revenues of the major industry verticals, including:

- **Financial services:** The banking industry is working to accommodate new digital and mobile payment systems as well as blockchain. Blockchain technology, for example, has implications in various applications and is being adopted for broader use cases than first imagined.
- **Health care:** The proliferation of networked medical devices as part of the IoT is targeting cost reduction—a key issue for the industry—and patient efficacy.
- **Manufacturing:** The development of intelligent devices—from aircraft engines to appliances—is re-imagining the relationship manufacturers have with customers, as well as their business models.
- **Retailing:** Retail firms—online and offline—are using software to change the way they interact with and engage customers, from offering promotions on smartphones to enabling inventory lookup at in-store kiosks.

Given the importance of cloud, mobility and analytics for compiling and transmitting customer and partner information, the importance of software is only going to increase. No segment is immune. The companies that best leverage industry knowledge and software savvy will thrive.

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The industrial software dilemma

Sometimes when you're in the middle of a revolution, rapid changes make it harder to see its effects. This is happening in industrial software. One need look no further than the millennial-targeted TV commercials of General Electric (GE) to know that it's repositioning itself to be a software and industrial company (GE uses the term 'digital industrial company'). Nor is GE an anomaly. Most manufacturing companies in the *Fortune* 100 are launching similar efforts.

- In August 2015, GE announced its Predix Cloud, calling it, "The world's first and only cloud solution designed specifically for industrial data and analytics, this platform-as-a-service (PaaS) will capture and analyse the unique volume, velocity and variety of machine data within a highly secure, industrial-strength cloud environment." The same announcement stated that GE had US$ 4 billion in software revenues in 2014 and predicted the number would increase to US$ 6 billion in 2015.

- Honeywell claimed US$ 1.17 billion in stand-alone software sales in 2015, and forecasts that its aerospace and automation and control divisions' software revenues will triple by 2020.

- In its 2015 Year in Review report, Caterpillar Chairman and CEO Doug Oberhelman wrote to shareholders, "Digital transformation is a reality for the world and for our industry … We already have more than 350,000 Cat machines and 50,000 engines, turbines and locomotives actively connected worldwide, and a total installed base of three million machines and engines. We're going to enhance telematics and data analytics offerings across our equipment—and across other brands, too … "

- In 2014, Boeing acquired ETS Aviation [2], a Bristol, England-based developer of fuel-efficiency management and analytics software. It folded ETS into its Commercial Aviation Services division, which began in 2000 as an information services business with the acquisition of Jepperson Sanderson. At the time, then-chairman Phil Condit predicted that the division would generate more than US$ 1 billion in annual revenues.[3]

Tracking the kinds of revenues these industrial companies are forecasting becomes a challenge when compiling a list like the PwC Global 100 Software Leaders. It challenged our ability to create the most accurate representation of an industrial company's software revenues. It's not a challenge solely for the market analysts collecting the data. It's also a challenge for the industrial companies, who are unaccustomed to reporting software revenue separately in their public financial statements. Boeing doesn't. GE doesn't in many cases. (That's why only its healthcare revenues appear on the current list.)

There's another reason tracking software revenue among industrial companies is so challenging. The Internet of Things phenomenon envisions sensors in everything, from kitchen appliances to medical devices to jet engines. These sensors will generate massive amounts of information, but because they're embedded, they're part of the actual piece of machinery. At present, PwC believes there's no reason to break out the revenue derived from the sensors as a separate line item, whether on an invoice or in a financial statement.

At the same time, though, we just as strongly believe that industrial companies will use the data generated by those sensors to drive various digital services—and revenue from those services should be reported separately.

We're not yet at our final destination when it comes to representing industrial companies on a list of software providers such as the PwC Global 100 Software Leaders. But we are confident of one thing: before long, industrial companies are going to realise, if they haven't already, that their software savvy is something to be celebrated.

2 http://dealbook.nytimes.com/2014/05/23/boeing-agrees-to-acquire-british-aviation-software-firm/?_r=0

3 https://www.flightglobal.com/news/articles/boeing-buys-jeppesen-in-bid-to-build-huge-services-unit-119393/

Conclusion: What to watch for

Together and separately, all these issues are rewriting the landscape of legacy software, of data centres, of on-premises versus cloud. This dynamic landscape is a challenge for legacy software vendors and their customers. Software vendors must determine what they buy, what do they own and with whom do they partner. On that last point, we're already seeing unexpected joint ventures, such as those between GM and Lyft, and others.

For enterprise customers, the new evolutionary/revolutionary landscape represents a plethora of options, but they must be cognizant of how their vendors respond on two fronts: certainly, security continues to be an issue, because data—especially wirelessly transmitted data—must be kept secure. Service also becomes more important, because as software options proliferate, and switching costs diminish, support becomes more of a competitive differentiation.

"In the future," says Chitkara, "there will be no hardware without software, and software will become artificial intelligence." It essentially becomes invisible. This spawns a number of questions that will focus the industry's best minds: If software is invisible, how can its impact and value be measured? Should software be everywhere? Do customers want *everything* connected and highly automated? And can the industry interconnect everything?

Questions like these have always been part of technology: just because innovation can achieve something, should it be done? Addressing and executing the answers to these questions will keep the software industry humming for a long time.

As software options proliferate, support becomes more of a competitive differentiation.

Methodology

The new PwC Global 100 Software Leaders list is based on corporate financial statements (GAAP-based where applicable), other public sources and estimates for privately held companies, as compiled for PwC by the Global Software Business Strategies Group at IDC.

Due to variances in fiscal years, the results were 'calendarised' for 2014, the most recent year for which complete data was available.

Currencies were converted to US dollars using the average historical inter-bank rate for 2014 as the rate of exchange. The historical rates used can be found at www.oanda.com. The table reports the company's total revenue and revenue from commercial software.

Commercial software revenue includes fees from licenses, maintenance, subscriptions and other software services, including Public Cloud Services—software as a service (SaaS) and platform as a service (PaaS). Total revenue also includes software plus hardware, nonrecurring IT service fees, business process services and other 'non-IT related' sources.

Gaming software companies and revenues are not included in software revenue.

Cloud revenue refers to all software revenue derived from the Public Cloud Services delivery model. In this utility computing environment model, unrelated customers share a common application and infrastructure managed by an independent software vendor or a third-party service provider that typically owns the code or intellectual property. The model provides access to and consumption of software and application functionality built specifically for network delivery and accessed by users over the Internet.

The myriad 'as a service' (APPaaS, PaaS) offerings—including business application services, databases, software development tools, high-level storage services (backup and archiving), testing as a service and security as a service—are all included in the category of Public Cloud.

Cloud revenues do not include Private Cloud Services. Private cloud services are shared within a single enterprise or an extended enterprise, with restrictions on access and level of resource dedication, and defined/controlled by the enterprise, beyond the control available in Public Cloud offerings. Hardware-oriented elements of IT cloud services, including Infrastructure as a Service (IaaS), that contain software, such as bulk storage solutions, network services and cloud servers, are not included in the Public Cloud figures.

For more on these definitions see: *IDC's Software Taxonomy, 2015* and *IDC's Worldwide IT Cloud Services Taxonomy, 2015*

In the table on pages 5-8, the Country HQ column refers to the operating headquarters in the country where the main corporate decisions are made. This may differ from jurisdictions listed for tax or financial reasons in corporate documents.

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Let's talk

If you have any questions about the Global Software 100 or would like to discuss any of these topics further, please reach out to us:

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