

Free Short Paper

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Information Technology Stage-5 **How New-Era IT Creates Winners and Losers**

Great ROI on Information Technology is back if you know where to look, but yesterday's answers aren't working. Business innovation is accelerating again . . . producing winners, and losers already.

IT Innovation has advanced at break-neck speed throughout its history, all the while moving through a series of stages and changing themes . . . disrupting, and producing big winners, and big losers. It's happening again, the last stages have stalled and the new one is picking up momentum.

In this short report learn what the new leaders are doing today to create programs with great ROI, plus learn their new ways to solve nagging legacy IT problems.

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Three Take-Aways

- **The rapid, disruptive, creative evolution of IT is speeding up again, and**
 - **It's time to get on board; it's a new paradigm to learn.**
- **The new IT paradigm supports (nearly) continuous business innovation**
 - **The most powerful sustainable competitive advantage ever created.**
- **Unresolved legacy IT roadblocks can be removed in more effective ways that the new paradigm provides.**

**Part I.
Introduction**

This paper is a brief update on IT innovation, where to look for the real action today, and why yesterday's answers are not working any longer. More importantly, we will discuss how to recognize the important features of the new cycle that is emerging, and what actions can be taken to bring in the opportunities for business leadership that innovators thrive on.

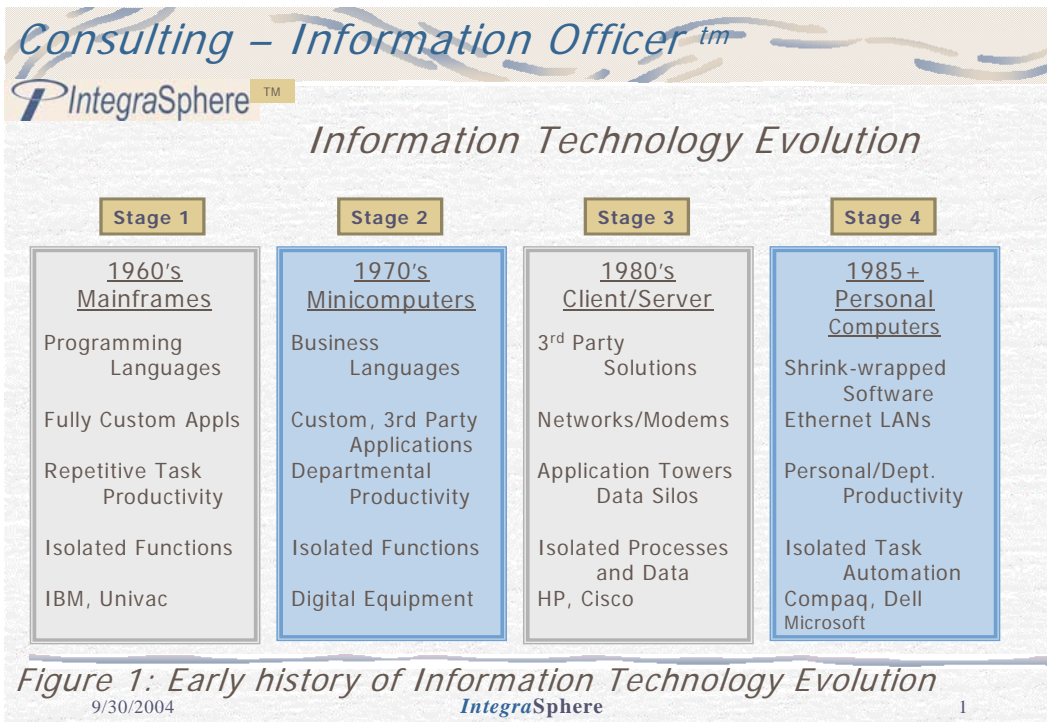
First, we are going to take a brief look back at the tumultuous history of IT. While we note how challenging the times have been before and how large are the changes that have been wrought, we continue and discover how to prosper as the times are changing again. We will find that the changes are fundamental this time, and the predicted impacts are dramatic.

Historical Perspective

Figure 1 represents the history of IT innovation as it moved through 4 early stages. The shifting emphasis and all the opportunities in IT were many and very significant in their time, and they really stressed executive leadership teams to keep pace with changes.

See the appendix for some interesting narratives on the stages of this history, and its significance for us. The moral of this story is simple:

The evolution of IT is rapid, often disruptive, and always creative. Winners sometimes miss a turn and lose their way rather suddenly, so we must keep our eye on the ball. As we proceed in this paper, we will discover that today's new cycle introduces a paradigm that changes virtually everything we assume about IT.



Record of Impact

Some executives have been able to recognize and exploit key IT changes to leverage business leadership. The first four stages of IT history produced revolutionary changes for business, creating some big winners and some losers who missed the turns. Because the legacy of each evolutionary stage does persist for years as technology remains in production much longer than the length of innovation cycles, we will focus separately on legacy problems, shortly. These examples suggest the scope of business innovation we have seen:

- Major new types of businesses were enabled and created, such as the credit card for consumers, and the nationwide remote computerized branch or the similar franchise operations (from banking to hamburgers, for example.)
- Industries were revolutionized including publishing, which became fully computerized, and telephone systems, which were automated.
- Industries were created like software products (Microsoft), systems houses (IBM, HP, and Digital) and consumer PC and digital systems (Apple and Dell), and integrated electronics (Intel and AMD)
- Corporate financial operations were revolutionized, as were business-to-business transactions.
- Repetitive-task automation software improved productivity by huge percentages, often by 2X to 10X across all types of business operations and some creative tasks as well. (Analysts have attributed the recent jobless recovery to the task productivity gains of the 1990's.)
- Professions were revolutionized; from technical engineering to secretarial services fields as they became fully computerized in virtually all areas of practice.
- The list of positive and innovative results goes on and on... but a long list of casualties missed the turns and lost out. (IBM created the broad PC market and then missed out on participation in it, Digital was created by the IT evolution and then was passed by. Wang and Compaq failed to respond to the dramatically changing times and disappeared.)

Legacy of IT Problems

Today, the combined legacy of stages 1 through 4 continues, and it has become very problematical for many businesses. So much so that some scholars suggest that IT is now just an expense item, no longer a source of innovative leadership opportunity. Consider this list of unresolved legacy issues:

- The 50-year focus on task and functional **automation addressed about 20% of the value businesses create**, but used 100% of the available budget for IT resources. (The tasks that are most often structured in software provide just 20% of the creative value, the rest of what we do in businesses is the other 80%.)
- **Businesses are saturated with task-oriented applications**, and related shelfware purchases that remain unused because their value is questionable.
- Businesses were never helped in addressing the other 80% of their activity that is critical to all management systems and to the value added roles of people.
- The creation of isolated “silos” of data and activity status, trapped in application towers, has inhibited the efficiency we expected, reduced the ROI, and has added

to errors and maintenance costs. And, it has **blocked any real integration of our end-to-end processes** where creativity is often exercised,

- IT systems and applications passed technology complexity to their users who must deal with maintenance, upgrades, or reconfiguration. These tasks consume huge amounts of resources and lead to a bottleneck in IT.
- IT staffs are bogged down in current operations support, and they cannot innovate very much today unless they are unburdened somehow.
- Software like email, Windows, or browsers designed for use in idealized situations (Camelot, or academia) doesn't stand up well in the real world streets where security, robustness, and authority are key to survival of the enterprise.
- **Software has not matured** but remains adolescent in character, and unnecessarily proprietary in functionality, interoperability, and support.
- The deluge of patches, fixes, and releases has swamped out much of the ROI we expected from software-based initiatives, and has shaken our confidence.
- Meanwhile, vendors have focused on a treadmill of upgrades, speed and feeds, and function additions to the 20%-solutions they offered, again draining resources and subtracting from ROI.

Perhaps all of this has contributed to a sense that we are stalled in our IT efforts, that it has become just an expense line item to manage, that the eras of innovation have passed. We will consider the validity of this viewpoint as we continue the paper, and we will also ask how the new fifth stage evolution can help resolve the overhanging problems from earlier times.

Part II.

IT's Fifth Stage: A New Paradigm

While we have been witnesses to the birth of a digital age, the focus of IT innovation has shifted several times on the way to today's fifth stage. Believe it or not, we are about to discover that this new stage is going to be the most dramatic and far reaching in its impact. Because this stage has introduced a basic paradigm shift already, let's start by naming some of the parts of it, first. Then, we will define the paradigm itself and talk about what it means for company strategies of today and the near future.

New Parts

The universal digital network (**the internet**), the universal electronic medium (**the web**), and major universal applications such as **the browser** and **email** are great examples of today's innovative new IT parts. All of these items are examples of the trend toward **standardized components defined by worldwide consortia**, a trend that will continue full force for years to come through standards groups, and open source software initiatives.

These universal parts have set the stage for worldwide IT interoperability, for the first time in history. The pervasive use of standardized IT system parts, operating in public as well as private venues, is revolutionary in itself, but it is even more revolutionary for the new paradigm it enabled. So, what is this paradigm of today's fifth stage that is redefining the IT landscape?

The new paradigm has two parts.

The Paradigm of Stage Five:

First, the universal medium (web) is the application platform for IT innovation.

Meanwhile most computers, traditional software applications, and the operating systems have all become commodities (even though vendors don't admit it yet).

Second, innovative applications are focused outward to the whole networked world rather than inward to our isolated in-company functions and personal tasks.

The **newest killer applications are all collaborative** in nature and are **extra-enterprise in scope**, examples are email, e-conferencing, digital (internet) phones, instant messaging access, and wireless access.

The new generation of outward-looking functions including:

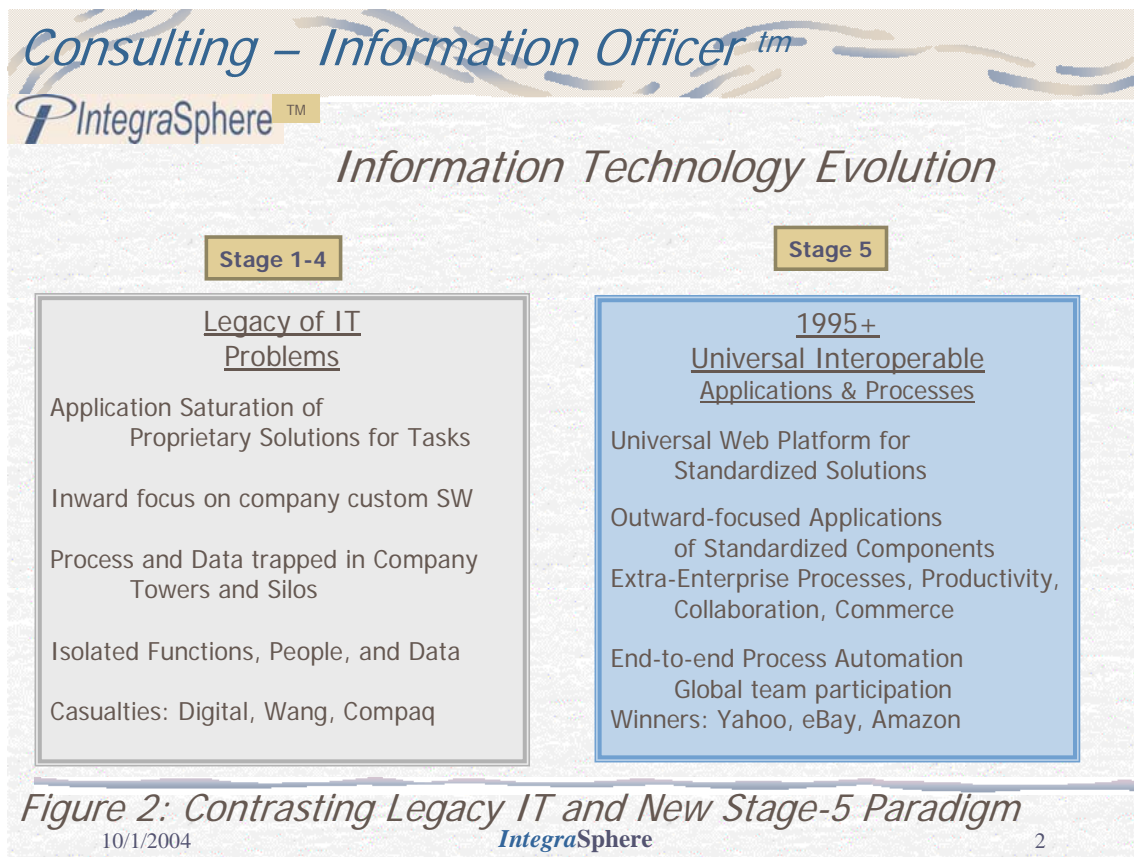
Collaboration like e-meetings,

Extra-enterprise processes like e-commerce or online customer support,

Virtualization like network based outsourcing or telecommuter remote offices,

are all implemented on the new universal public media which is not bounded by state borders, company borders, or time zones.

Figure 2 provides a view contrasting the legacy IT problems remaining with us, from stages 1 to 4, and the new characteristics of the stage five paradigm.



The agenda of innovation is just dramatically different from earlier stages of IT, and it lines up with the 80%-of-value creation activity in business that IT has always ignored. This gives the fifth stage its tremendous potential to drive ROI and leadership. But there is more to consider, because some other consequences of the new paradigm have become visible already

Over night it seems, we have enabled a whole dimension of globalization that did not exist before, and again there are disruptions in employment, jobs and business as free market economics works with new choicess. The first few steps into stage five paradigm have enabled global outsourcing of that piece of routine task-automation that has preoccupied IT for so long. Outsourcing of automated tasks is setting off a commoditization of the task oriented services work as it engages low cost labor markets.

Let's stay focused on the main message in this, which is clear,

Globalization for markets and of resources is accelerated by the stage five IT paradigm. These resources are part of the value creation ecosystem that business will tap according to market economics. The potential for innovation in this space is unrivaled in history because it is about real-time services (rather than the widgets or boxes associated with outsourcing the manufacturing value chains.)

Now, let's turn to investigate where the fifth stage of IT innovation is headed, what it means to our strategies for business innovation leadership, and how we can deal most intelligently with legacy problems in IT operations. Let's also think about a name for the stage-5 paradigm.

Today's Business Needs and Opportunities

We can start with the priority problems of today, and then look at some high payback opportunities that are a bit farther ahead. We can be confident that our roadmaps must flow toward these poles of practical need, and investment payback.

Problem Category A Resolve Legacy IT Problems (Immediate)

IT is bottlenecked with a range of burdens including operational complexity, maintenance, fixes, inadequate software, upgrades of no value, reconfiguration, preventive monitoring, lawlessness via networks, and other traumas.

Strategy Hint: We will fix this one by strategic outsourcing to a very specific type of professional team. This offloads a large burden that has no strategic value in itself, to specialists who dealing with it better than individual companies can.

Solution Hint: We need to locate the appropriate managed services providers who specialize in efficient handling of these issues, who can enhance the cost-performance we get, and outsource the work to them.

Problem Category B Address Silos and Towers (Immediate + Future)

Valuable end-to-end process integration is blocked, we have unmanageable process snips and activity status trapped within application towers, we have data trapped in silos, and all of it is task-oriented stuff that ignores 80%-of-value we need to create and drive.

Strategy Hint: First, we must pry open the silos and towers to gain access to valuable data and visibility to status and compliance of our operations. Longer term, we must work on replacing the application towers and data silos with software-services components having standardized interfaces, and standardized functions to support our end-to-end processes. Vendors are already moving to provide such versions of their products under this new paradigm, and we will demand much more from them.

Strategy Hint: We want our end-to-end processes running on a single new business process automation (BPM) framework with the tools for flexibility and rapid evolution.

Solution Hint: We will use tower/silo data feeds via standards based protocols to support visibility and new processes that are implemented in a framework for business process automation (BPM). The result will be greater transparency of our operations and compliance status. Then we will exploit this approach more extensively in category C.

Challenge Category C Automate Creative Activity (Medium Term + Future)

We need a practical way to bring systematic processes and automation, integrated compliance management, knowledge worker support, and value creation tools to the other 80% of our creative work as a company, including our management systems. (Everyone is becoming a knowledge worker of some kind.)

Strategy Hint: We will accomplish this by adding a single, flexible process framework to run over the standard universal medium (web), and to support the missing 80% of enterprise creative activity.

Solution Hint: Business process automation (BPM) with collaboration (let's call this **contextual-collaboration**) as a new framework layer will be the strategic way to implement end-to-end systematic processes and automation, and to extract processes from the old application towers as they are converted to SW-services provider components. These innovations can bring about huge increases in our creative productivity (not just task productivity) across the whole range of business activity, and across global teams, when we do it right.

Challenge Category D Virtualize the Workspace (Medium Term + Future)

We must create a way for our companies to deal with outsourced services of many kinds, location independent contributors, and remote workers with absolutely rock solid identity, authority, and contributive action taken.

Strategy Hint: Creating the infrastructure to virtualize the way that people and processes access and interact with the business at hand will solve this problem. We will need both BPM and robust new identity management and verification.

Solution Hint: New application services to handle identity and authority have emerged already, and can be used to support new systematic processes for the other 80% of what we are creating every day. This will support the BPM framework as additional online services.

Our people and processes working across the universal medium from any location are going to be the new virtual operating entities of our business. This might sound futuristic, but it is happening now in some respects. We must make it more robust, secure, and reliable rather than experimental as it is today.

Challenge Category E Secure Individual Contributors (Long Term)

In the future, as global virtual workplaces take hold, employees must be absolutely identified at the point where they access our business activity. Identity verification must be foolproof, real-time, and sustained.

Strategy Hint: Identity systems will combine biological (eye, voice, finger prints), interactive exchanges (unique knowledge), and passkey techniques for the level of security that is required.

Solution Hint: The mobile workstation will become the point for identity verification of the person, and it will also become the persons unified communications center where secure access to the business venues is accomplished. Other than these functions it will run standard software for interacting with processes over the universal medium (the web). It is likely that personal choice services that are not business related will also be accessible from this secure platform for knowledge workers. It is all they will need.

Note: This mobile workstation will be a new kind of PC that the industry will offer, replacing the type of units in use today, creating a huge demand that includes consumers.

These five categories will offer business leaders a chance to apply stage five innovations in ways that have great value for business: by offloading non-core burdens and reducing expenses, automating the value creation activities and processes mostly overlooked until now, and creating entirely new structures for business ecosystems. Let's map the essential strategy concepts in a short example.

An IT Strategy Example

Consistent with the business needs and high payback opportunities we have discussed, our example of a high level strategy will include the following items. Of course, we must have knowledge of a specific business before we can develop a full strategy to implement specific objectives, or to solve particular problems, of a real business.

A. Follow Stage Five Principles

- The primary innovation guide will follow the stage five paradigms:
- Our application platform will be the universal medium of the web with BPM services implementing processes, and connecting to application services.
- We will focus outward to create and leverage our business ecosystem including:
 - Team collaboration with access to the process contexts
 - Virtual workplaces with location independence
 - Global scope for markets and resources as appropriate
 - Extra-enterprise enablement of all types of business activity

This model will position us to participate in the new world of stage five business activity.

B. Outsource Non-core IT

We will outsource through the use of managed services professionals most of our non-core tasks, including the support of our legacy infrastructure of computers, software applications, and operating systems or middleware. We will seek to stabilize the legacy infrastructures except where we need to modify them to support the agenda for business process automation. This will free up IT resources to lead the new agenda of innovations with their updated skills.

C. Automate Creative Processes via BPM

We will add business process automation for creative activities and management systems, and new tasks using the BPM framework and templates. (Make sure to keep all its flexibility and fast response characteristics to support the rapid evolution of our businesses throughout stage five.) We will only add task services (applications) that integrate well with BPM.

D. Use BPM for Tactical Process Integration

We will extract or integrate important process segments from the task application towers as needed and place them into the BPM framework for end-to-end process integrity, control/compliance, and management effectiveness.

We will pry open the silos and task application towers for access to data and activity status required to support effective management systems, transparency of operations, compliance reporting, and process review and improvements.

E. Transform Application Towers to Services

We will transition from using application towers for task automation to using application services software to support our company's business processes in the BPM framework.

F. Universal Identity Management

We will add robust identity management to support extra-enterprise processes involving employees, partners, and customers located anywhere, and this structure will control all processes and applications of our enterprising businesses.

G. Virtual Secure Workspace

We will evolve our employee mobile workstations toward the stage five model for robust identity verification, unified communications support, and standardized clients for access to processes and collaborative venues. Simpler.

Summary and Conclusions

With a strategy outline in place, we find that several important things have been accomplished. We will not be blind-sided nor passed-by as the innovations of stage five roll forward, and we can confidently include essential items in our detailed business-specific strategy.

- We know where the high payback IT investments are to be found.
- We know why and how to cap investment in older low yield projects.
- We are ready to prepare for the major new stage five business paradigms.
- We know how to prepare for and participate in the globalization movement.
- We know how to engage all our constituents via contextual collaboration.
- We know how we will produce integrated processes with compliance built-in.

Imaginative leaders will start to feel more lift under their wings, and see horizons of opportunity as their business connects to a global ecosystem of markets and of resources.

The combined internal and external environments of stage-5 IT will allow entrepreneurs and innovative executives to entertain options that they never could before. Consider this:

An enterprise is defined as a scoped, systematic, industrious undertaking that manages ventures, risks, and complexity as it pursues beneficial outcomes. (Nowhere is size even mentioned.)

The **Era of Any-sized Enterprise** is here, enabled for those who implement businesses with stage-5 technology to support them. Maybe that is the name of the new stage-5 paradigm for business automation.

Appendix - Historical Narrative

(1960's) In the first stage of commercial IT innovation **Mainframes** came into use, with the early general **programming languages**, and these were exploited to produce what we would now consider small-scale functional tasks in full custom applications. The **IT department was created**, populated by 'techies' and programmers, and supported by very adventurous sponsoring executives. There were alarming stories in the press about loss of jobs due to automation.

(1970's) Then in the second stage, while Mainframes grew, lower cost minicomputers arrived, and we saw the first crude computing networks, the new **business-oriented languages**, and many more custom **departmental-scale applications**. The IT departments budgets grew, and centralized management supported the glass house (the corporate **central computer complex**). Large vendors moved their own direct marketing people into their customers' premises to advise them. Employment expanded rapidly as the enterprise opportunities seemed limitless.

(1980's) The third stage brought departmental scale systems with much lower costs (built from early processor chips and standard Unix software that enabled **client/server systems**). Sometimes these **systems were distributed** among the users, which was a huge change, but the glass house also grew. There were **new skills and careers in business automation**, and independent vendor-produced enterprise applications like accounting and ERP emerged. IT departments were realizing a role as

corporate infrastructure managers and strategists. Programmers and Engineers were in very short supply as employment mushroomed.

The IT department was in charge of most data, computers, applications and operations in these stages, but IT which was operations oriented was often viewed as blocking progress with their very rigid approach to innovation. They would soon be circumvented.

The **rise of the distributed, isolated computing domains** within companies meant that some corporate data was being trapped, in what we now call “silos”. Few people expect this to become such a large problem, but it has evolved into one of the most serious obstacles to progress of the present day.

Up to this point, computing in corporations was **inwardly focused**, with a preoccupation on “the company way” of doing everything, based on unique practices, custom applications, and large staffs of IT professionals. Much of this kind of inward-focused thinking continues today, but it is out of step with new realities. Obviously, computing was for the companies with very large financial resources and not for everyone.

The focus on enterprise-only computing was about to change forever, but strategists who predicted it were disregarded. The change caught almost everyone off guard, and there were stunning consequences for some enterprise incumbents as new industry segments sprang up to bypass them entirely. The personal computer phenomenon was about to happen.

(1985+) In the fourth stage, personal computers and shrink wrapped software exploded onto the scene, bringing a **personal productivity focus, departmentalized computing** everywhere, local area networks, and the end of the hegemony of the IT departments. This stage brought about fantastic increases in productivity for specific people and their individual (isolated) tasks.

It was a very disruptive stage. It spawned new players that became giants, like Intel, Dell, and Microsoft as they expanded their niches to become industries. The new markets and new products of this stage transformed the distribution channel for technology to create a two tier structure that employees hundreds of thousands of sales and technical professionals. At the same time some industries and companies were killed off, like the typewriter businesses and the word processing system businesses, while the smaller printer businesses thrived.

The fourth stage also gave momentum to the role of computer-based games and hobbies driving IT advances in graphics, networking, and collaboration. With home computing for many kinds of applications, the first seeds of home office computer use were planted when applications like spreadsheets and word processing appeared early in this stage.

The Point

The moral of this story is simple. The evolution of IT is rapid, often disruptive, and always creative. Winners sometimes miss a turn and lose their way rather suddenly, so we must keep our eye on the ball. As we proceed in this paper, we will discover that today’s new cycle introduces a new paradigm that changes virtually everything about IT.