Connected Intelligence: Leveraging Collective Wisdom

By Vasu Srinivasan

Connected Intelligence: A Prelude

"Man has always assumed that he was more intelligent than dolphins because he had achieved so much—the wheel, New York, wars and so on—while all the dolphins had ever done was muck about in the water having a good time. But conversely, the dolphins had always believed that they were far more intelligent than man … for precisely the same reason." - Douglas Adams

I have been taking Route 30 for my evening commute for as long as I can remember. I drive back home enjoying the sunset. It has long been the best part of my day. But what I saw last Tuesday was rather unusual. The dash of orange had the right tint, the size of the magnificent ball just right, the expanse of the canopy painting just right, and the view from my automobile window perfect. Overall, what I experienced can be characterized as an epiphany.

One could easily use the tools of psychology and attribute the experience to a good mood. But rather than analyzing the experience and reducing it to a simple quality, I have a different takeaway from that experience, which is this: there is capacity for beauty and then there is manifested beauty. What I experienced on that Tuesday was manifested beauty.

Similarly, there is capacity for intelligence and then there is manifested intelligence. The mouse, which has a low intellectual capacity, could exhibit intelligence by recognizing faces of other mice fairly reliably. But, the most advanced intelligent systems, capable of performing more seemingly sophisticated tasks than the simple mouse, could fumble to recognize faces because of a smile (I did mean human faces :-)).

So, I would like to turn the discourse on intelligence to manifested intelligence. Nature provides abundant examples of manifested intelligence, both individual and collective.

My favorite example of manifested collective intelligence is the waggle dance performed by bees to collect honey. If a honeybee discovers a good feeding site, she informs her nest-mates through a waggle dance that encodes the distance and direction of the feeding site.

Such a high level of manifested collective intelligence could be possible in a low individual intellectual capacity species only through DESIGN. I am using the prism of the process of manifested intelligence (How), rather than content (what makes it happen), and avoiding the whole Intelligent Design debate/doctrine.

The Apollo Effect postulates that it is impossible to have too many bright people work together and still be productive. I argue that it takes design to connect the individual to the collective. And, of course, the design is dependent on the context.

AH! THE CONNECTED INTELLIGENCE: THE POLY-ERA

We seem to be living in future shock, what Alvin Toffler predicted thirty years ago...
or at least some aspects of it.

Presently, we are living in a complex, hyper-connected World. Thousands of authors write reams and reams of literature every day, trying to make sense of it all with the intention of gaining leverage from the connected world. We do so in the multiple modes that technology allows us—in books, on blogs and YouTube, etc.

The World is Flat, declared Thomas Friedman.

It is a *Long Tail*, says Chris Anderson.

Everything is Miscellaneous, avers David Weinberger.

Seeing it as *The Wisdom of Crowds* was a profound insight from James Surowiecki.

The truth is that we have reached not one era, but a multitude of eras, all at once and in a time-space compressed fashion.

Their perspectives addressed several aspects of business, life and the human condition in general.

The truth is that **we have reached not one era, but a multitude of eras**, all at once and in a time-space compressed fashion. This has caused a shift in our expectations and our practices that impacts how we work, what we consume and how we live life.

Currently, the only tool that we have in our hands to combat this phenomenon is Change Management. It is a linear response to the non-linear set of changes happening in this Poly-Era (or Era containing multiple Eras). It is so Newtonian. We need a holistic new paradigm.

Complex Systems, on the other hand, has the beautiful notion of Emergent Structures, which are patterns not created by a single event or rule. Instead, the interaction of each part with its immediate surroundings causes a complex chain of processes leading to some new order.

The Connected Intelligence System is a practitioner-centric corporate operating system that augments Knowledge Work. The principal components emerge out of simple interactions of fundamental components and are based on Complexity Thinking.

It provides tools to address the changes that have taken place all at once in the human enterprise, due to the coming of the Poly-Era, in a holistic fashion.

This manifesto presents the case for the need of a Connected Intelligence Operating System.

RATIONALE MANAGEMENT FOR THE COMPLEXITY ERA

When gold was discovered in California in the mid-19th century, several hundred thousand people rushed there from other parts of the country and abroad, starting the California Gold Rush.

The 49ers, as they were called, took three major routes west, sometimes taking about eight months to travel coast-to-coast. Life was less complicated back then and things which we now take for granted were impossible, or even if they were possible, took a very long time.

After the Industrial Revolution brought the railroad west, life started to change. But, still times were quiet enough on the factory floor, as there were a limited number of options. Making decisions was still the most sacred activity for the manager when compared to generating alternatives.

These days, a similar journey would take hours instead of months. Somebody invents planes, somebody else manufactures the planes and the millions of components in it, and somebody else takes care of booking, scheduling and managing the airport, all for the seemingly simple trip from New York to California. We have entered into the Era of Complexity.

In this Age of Hyper-Choice, generating the alternatives is most of the work. We need to move from the *decision perspective* of management to the *design perspective* to take advantage of the plethora of choices.

With a “managing as designing” mindset, decision making would no longer be the privilege of a cabal anymore. Because of its enormous utility, we could now give importance to recording, cataloging and revisiting the decision-making context.

Decision making involves choosing an option from a set of identified alternatives that sufficiently satisfies a specific set of criteria or goals. The key thing is to capture the context the decision was made in, which would be useful for future decision making. Such recording and cataloging is

crucial, not only to understand the context in which a decision or a set of decisions was made in the past, but, most importantly, to allow for re-usability in the future.

The Rationale Repository aims to institutionalize the process of capturing the decision-making context, thereby attempting to actualize re-usability, and is a key foundational component of the Connected Intelligence Operating System.

PROCESS: THE SUITCASE WORD IN THIS KNOWLEDGE ERA

The seemingly ordinary act of catching a ball provides an enormous opportunity to understand the role of process in this Knowledge Era. Even a lay person with some practice would be able to catch a ball. Yet, understanding ball-catching involves physics, control theory, physiology, kinesthesis, ethology, perception and the study of expertise.

In the ball-catching case, Practice makes the notion of Process look superfluous.

Spotting expert ball-catchers and setting expectations for them is a lot simpler than trying to understand “how to catch the ball” and then trying to codify the process for everyone to follow.

The Industrial Era exemplified the value of automation. Fixation on the Process of manufacturing products yielded direct results through increased productivity, reduced production times, higher quality and, most importantly, reduced costs. Process improvement was therefore a pivotal leverage point, and defined processes were the dominant tool considered to be capable of solving a range of problems.

In the current Knowledge Era, work can be broadly classified into administrative and innovative work. Administrative work can still derive the value of defined process, i.e., the instrumental value of repeatability can lead to the terminal value of predictability of outcome. However, in innovative

work, defined processes will not necessarily yield successful outcomes. In fact, in some situations, defined processes in their current form could severely impede innovation.

The static nature of defined roles, defined activities, defined activity sequencing—the hallmarks of a defined process—do not lend themselves very well to this knowledge era. We need to recalibrate our mental models of Process and instrument it differently in order to galvanize the value of Practice. We need to think in terms of *augmentation*, rather than *automation*, i.e., augmenting human expertise and intelligence.

There is a need to evolve the current notion of defined process into a principle-based, practitioner-centric, emergent Process—the Uber-Process.

The Uber-Process is a first-order emergent functional component of the Connected Intelligence Operating System. First-order emergence occurs as a result of the interactions in a Complex System's foundational components. The Uber-Process transforms the meaning of Process from a placeholder for something that we don't know much about, into a more potent form, germane to the Knowledge Era.

We need to move from the *decision perspective* of management to the *design perspective* to take advantage of the plethora of choices.

TALENT FILTER FOR THE PROSUMER ERA

We are in the age of participation, or the Prosumer Era, where we are not only consumers, but can be producers at the same time. Millions of Prosumers create content in formats not possible before, ranging from the truly incredible to the shockingly mundane.

Are these Prosumers creating digital forests of mediocrity, or are we on the cusp of a Digital Renaissance? Time alone can answer such questions.

Regardless of the characterization of this phenomenon, it is true that, by way of crowdsourcing, we have new access to a boundless quantity of talent at our disposal.

Early experiments in engaging this mass talent seems to have yielded the desired results... and in rather big ways. Wikipedia and Linux are emblematic of such successful outcomes.

If we take the Linux case, it is not as though talent congregated and democratically evaluated each design decision. Rather, one individual, Linus Torvalds, functions as the talent filter and makes dividing, prioritizing and scoping tasks appear virtually non-existent.

Wikipedia is a unique beast in that, because of its sheer scale, it can tolerate imperfections at the micro-level. It is therefore not a canonical crowd-sourcing case study which we could draw our lessons from.

If crowdsourcing is to work, considering the human population comprises a diverse population of Einsteins, Celine Dions and village idiots, we need a system of collaboration—a discipline, just like human language and the scientific method, which constantly separates the relevant material from the chaff.

Also, we learn time and again from history that the cost advantages one enjoys now from crowd-sourcing are not sustainable in the long run. These cost advantages usually arise due to the temporary lack of equilibrium existing in the talent marketplace and will therefore likely evaporate soon.

With such a prism, our task at hand would be not to source work, but to connect intelligence and the pivotal component of connected intelligence systems—the Talent Filter. The Talent Filter is a first-order emergent component of the Connected Intelligence Operating System.

NOTEBOOK LIBRARY FOR THE ALWAYS-ON ERA

CNN brought us away from the 9-5 and into the 24-7 Era by providing news all through the day (and night).

Expectations of the workweek have stretched from the traditional 9-5 to the always-on, always-working time frame. We are increasingly contacted by customers, employees and other work-related people during off-hours by phone, e-mail, instant messaging and so on.

In this context, do we even need the clock anymore? No. Not at all... It is an artifact of the Industrial Age.

Instead, welcome and celebrate the advent of the microscope.

The clock, abacus, magnifying glass and the dollar were the management instruments of the Industrial Age.

The abacus used for counting the produced items is already gone. The almighty dollar would stay.

It's time to replace the magnifying glass with the microscope. Instead of the clock, use your fine sense and look up at the sky for the time. If you can't, try using the calendar instead!!

The clock was the symbol of the Industrial Age, how we measured work. The microscope is the brave new icon. But, how do you apply this concept in practice?

Burying the clock is possible only if the microscope is widely used.

Using the microscope to inspect the work products of employees correctly requires, not processes, but building a culture of expert practitioners.

While spotting expertise can be done in an "I know it when I see it" subjective fashion, objective criteria needs to be adopted for the inspection of the systematic expression of the expert's knowledge. The only way to realize this goal is to build a library—a library of notebooks, notebooks of Knowledge Workers.

Its main purpose is to identify and reward human expertise systematically. It is the functional equivalent to rewarding the number of years of service in the Industrial Era. The notebook library also functions as an instrument for conducting organizational discourse.

Thus, the Notebook Library is one of the foundational components of the Connected Intelligence Operating System.

AMBIENT INFORMATION FOR THE INFORMATION OVERLOAD ERA

Back in the day, one could certainly compare information to diamonds, i.e., information was considered both precious and the source of power. You would go to an authentic information source, such as the library or the *Encyclopedia Britannica* and get precise and authentic information.

However, that paradigm changed with the Internet as information lost its premium status. With easy access to information, the metaphor that one could associate with information is no longer a diamond, but water. Information is both readily available and covers a much wider

scope (unimaginable before) thanks to the Googles and Yahoos of the world, who act as the pipelines in providing information.

With this water metaphor, two new issues erupt.

We are enveloped in hyper-information. We need to be skillful in deciphering, and segregating, the fluff from the stuff. In the wiki culture—where anyone is able to override an expert's insight—you must judge any information that you obtain rather than taking for granted its authenticity.

The new system depends on an honor code. Semantic pollution cannot be managed well in the absence of a strong central control.

Another wrinkle to this issue is the following: physical laziness was effectively spotted in the Industrial Era by using time cards, monitoring for slacking workers and so forth. Slackers were punished commensurate to the extent of slacking. But, intellectual laziness is a lot harder to monitor and control. Intellectual laziness is a leading cause of the "semantic impurity" of knowledge.

The other issue is to handle flow control, so that people are not overwhelmed by the information overload. The principle of affordances comes in handy to address this issue.

"The floor slopes gently, almost imperceptibly downward, drawing you toward the altar....
What makes this potent architecture is its ability to draw you through these spaces without any coercion. There is no single path, but you intuitively know where to go." - *New York Times* review of St.Pierre Church

Donald Norman, author of *Emotional Design*, says that the phrase "you intuitively know where to go" is the power of visually perceivable affordances. With the foundational components being able to handle the twin problems of impurity and overload, Ambient Information is a first-order emergent component of the Connected Intelligence Operating System.

INVARIANT CODES FOR THE "LAW OF LARGE NUMBERS" ERA

"An individual ant is not very bright, but ants in a colony, operating as a collective, do remarkable things. A single neuron in the human brain can respond only to what the neurons connected to it are doing, but all of them together can be Immanuel Kant. That resemblance is why Deborah M. Gordon, Stanford University assistant professor of biological sciences, studies ants."—Stanford University News Service

Corporations could learn a lot about organizing work from ants. There is no central command within ant colonies. Ants have well-defined roles and responsibilities, and they adroitly switch roles when the situation arises, without the need for any central control. It is daunting to learn how fire-ants in the Amazon respond to disasters such as floods by forming a creative "ant-raft" to reach safety.

It is tempting to embrace the paradigm of bio-mimicry, to apply such "sub-human" organizations to human enterprises. Yet, there is a pivotal difference—the speed of adaptation to change. It takes time—probably centuries—for ants to evolve this adaptation strategy for a flood. When a new kind of threat is presented, ants probably cannot survive. Humankind, however, with its superior problem-solving ability, could evolve swift adaptation strategies and handle a variety of new changes.

An ant organization achieves its goals because worker ants follow some simple rules, tirelessly and without any variation. What would happen if worker ants didn't like the way things were going, became unmotivated, and did not perform their tasks?

This is not a possibility in the ant world, but a reality in human organizations. The Industrial Age organization handled this well by instituting a system of employee policies. Any departure in conduct to the employee policy handbook was met with a disciplinary action, commensurate with the employee action, which was codified elaborately. They brought the much needed discipline in execution and predictability of good outcomes. This system worked very well and the organization functioned like the well-oiled machinery it proudly housed.

In this age of hyper-choice and dynamic change, employee policies could act merely as a framework for controlling outliers. Increased rigor in implementing employee policies would result in inertia and could permanently paralyze organization. People are more likely to follow what they have agreed to, rather than what is imposed upon them.

So, a Futarchy-style corporate governance that solicits Invariant Codes from all members and prioritizes them based on prediction market performance would be a potent tool for disciplined execution. This bottom-up approach could enable efficient administration of a larger scope of policies, thus suitably augmenting the top-down employee policies.

The Invariant Codes employee handbook is a foundational component of the Connected Intelligence Operating System.

"A single neuron in the human brain can respond only to what the neurons connected to it are doing, but all of them together can be Immanuel Kant."
Stanford University News Service

INSIGHTS MICROBLOG FOR THE "EVERYTHING IS MISCELLANEOUS" ERA

"I, Pencil, am a complex combination of miracles: a tree, zinc, copper, graphite, and so on. But to these miracles which manifest themselves in Nature an even more extraordinary miracle has been added: the configuration of creative human energies—millions of tiny know-hows configurating naturally and spontaneously in response to human necessity and desire and in the absence of any human master-minding! Since only God can make a tree, I insist that only God could make me. Man can no more direct these millions of know-hows to bring me into being than he can put molecules together to create a tree"—"I,Pencil" by Leonard Read

Specialization enabled us to create and produce a larger variety of things in astounding volumes and to ensure high predictability in outcomes by managing a complex business ecosystem. However, specialization has its own set of pitfalls, potentially leading to silos and fiefdoms in organizations. A new revolution is happening due to digitalization. According to David Weinberger, everything has become miscellaneous, and I believe this could alleviate the pitfalls of specialization.

According to Weinberger, human beings are accustomed to classifying physical objects. A book can occupy only one place on a shelf, even if it pertains to many different topics. Thus, we have come to think in mutually exclusive categories, often arranged in hierarchies. These categories reflect a simplified, incomplete view of reality. In contrast, digitized information can have any number of links attached to it. Users are freed from the one-object-one-label view of the world. Weinberger says, "Removing information from a physical form allows us to focus more on its relationships to other information, a way of thinking that better reflects the complex nature of reality."

So, we could have an emerged form of specialization—different from the first-order notion of Specialization, which is more pertinent to insects—that takes insights and feedback from other domains and integrates it suitably. We could enhance the "shoemaker makes good shoes because he makes nothing else" shibboleth without impeding human passion and curiosity.

However, it would be a huge time investment to obtain input from anyone interested and analyze its fitness, accepting or rejecting it for the current context. We need a smarter, asynchronous method that does not demand too much time.

Technology could allow people to share vital insights about their domain, as well as domains that they don't have direct experience in, but do have passion and curiosity for. The Insights Microblog is a foundational component of the Connected Intelligence Operating System that does not concern itself with temporal application. The Insights Microblog could function as an insight freezer. When the time is appropriate, one could pull an insight from cold storage, thaw it and cook it to use.

"Removing information from a physical form allows us to focus more on its relationships to other information, a way of thinking that better reflects the complex nature of reality."
- David Weinberger

MARCHITECTURE FOR THE MULTI-SOURCING ERA

"Many of the emergency decisions which were made in New Orleans were made on the basis of a project management task-oriented mindset. ...

Someone in the New Orleans School Department was charged with ensuring that the school bus drivers were safely evacuated from the city, and were to be within communication reach so as to be recalled once the catastrophe had passed. This person did his job extremely well. By the Saturday morning prior to the storm the school bus drivers were safely out of town. Unfortunately, it was readily apparent by Saturday launch that the school buses were needed both for immediate evacuation needs and to provide for further evacuations once the storm had passed. More than 700 school buses were parked in an open field approximately 11 feet below sea level. There were no bus drivers. There were no keys. By Tuesday there were 700 flooded buses. From a project management point of view the school bus driver dispatcher had done his job magnificently. From a dealing with the catastrophe point of view, the excellent performance of the dispatcher led to increased human suffering and misery."—Michael Lissack, director of the Institute for the Study of Coherence and Emergence

Project Management, beyond any doubt, has proved to be an invaluable tool to achieve goals by effectively and efficiently managing resources within identified constraints. The Project Management Framework is the epitome of aggregating the human capabilities in a human enterprise. Organizations have an evolved and disciplined approach of standardizing, sequencing and integrating (and for that matter any type of human aggregation) thanks to the Project Management Framework. However, as Michael Lissack notes, it is not the hammer for every non-nail problem, particularly when there could be significant environmental changes.

In this Multisourcing era, where you could in-source, outsource, near-source or crowdsource work, it is safe to assume that the environment in which project management happens is dynamic and

not static. The only way to handle it is not to abandon the notion of project management altogether, but to enhance it to handle this dynamic environment.

As noted earlier, if the emphasis is on problem-solving rather than decision making, we would then be able to treat management as a design problem.

Marchitecture, in this case a portmanteau of management and architecture, is a second-order emergent component of the Connected Intelligence Operating System. It is second-order because it takes practice and time to get etched into the enterprise's operating DNA. The foundational components and the first-order emergent components, in turn, are responsible for the emergence of this second-order component.

TALENT ENGINEERING FOR THE UNIVERSITY OF GOOGLE ERA

"Suppose that we rate mathematicians on the basis of pure talent on a scale from 0 to 100, I give myself a modest 25, Littlewood 30, the great Hilbert 80 and Ramanujan 100."—G.H.Hardy, Eminent mathematician

Srinivasa Ramanujan did not have a doctoral degree in mathematics, not even the basic formal training in mathematics to rationalize Hardy's Encomium. In fact, he failed his B.A. exam and worked as a clerk.

Yet, he solved many of the mathematical problems that confounded the best mathematicians at the time, and recorded his successes diligently in his notebooks. Ramanujan's passion for mathematics was powered by only the textbooks he had access to.

Ramanujan is one of history's best examples of an autodidact (or a self-taught person).

We have reached the University of Google Era, where the Internet provides countless affordances for a curious person to develop his talent. The MIT OpenCourseware and the Berkeley YouTube channel are distinguished examples of kindling the self-directed learner.

This easy access provides many opportunities to create self-directed learners of several different calibers. Organizations must be ready to identify, embrace, capitalize and absorb self-directed learners alongside traditional learners.

While in the Industrial Era, the challenge was to manage the conventionally trained human resources available in the organization. There is a new challenge in this University of Google Era: to engineer the talent precisely to the complex needs of the organization, to find a standard way to manage this motley bunch of expertise.

Welcome to the Poly-Era Enterprise, where passion is welcomed, nurtured and engineered rather than playing the banal paean of teams. Such an outlook is possible due to the focus on amplifying human capabilities rather than aggregating them, which management practice has been very good at thus far.

Talent Engineering is a second-order emergent component of the Connected Intelligence Operating System that emerges from the interaction of the foundational components over time and practice, and has the potential to become etched into the DNA of the organization.

Organizations must be ready to identify, embrace, capitalize and absorb self-directed learners alongside traditional learners.

POSTSCRIPT: CONNECTED INTELLIGENCE

In the Industrial Era, management practice was well-evolved in aggregating human capabilities, such as standardizing, sequencing, integrating, etc. However, there is no standard approach for *amplifying* human capabilities such as passion, creativity or intellect. In this regard, management seems to be stuck in the Industrial Era, and is not equipped to handle the challenges posed by the Poly-Era.

The Connected Intelligence Operating System aims to transform the management practices of an organization stuck in the Industrial Era by propelling the organization forward to the Poly-Era. Superior leadership and discipline in execution alone could realize such a phenomenal transformation.

Here is the Essence of Connected Intelligence:

For the Poly-Era: The Connected Intelligence Operating System displaces Linear Responses such as Change Management.

Four Foundational Components:

1 For the Always-On Era: Notebook Library displaces the Clock.

2 For the Complexity Era: Rationale Repository displaces cabalized decision making.

3 For the “Everything is Miscellaneous” Era: Insights Microblog galvanizes formal documentation.

4 For the “Law of Large Numbers” Era: Invariants Codebook augments Employment Policies.

Three First-Order Emergent Components:

1 For the Prosumer Era: Talent Filter replaces traditional Sourcing filters.

2 For the Information Overload Era: Ambient Information replaces document management.

3 For the Knowledge Era: Uber-Process replaces Process.

Two Second-Order Emergent Components:

1 For the Multi-Sourcing Era: Marchitecture enhances Project Management.

2 For the University of Google Era: Talent Engineering replaces Human Resources Management.

Rather than merely focusing on aggregating human capabilities, the Poly-Era Enterprise needs to amplify the human capabilities as well by connecting individual intelligence to the collective.

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ABOUT THE AUTHOR

Vasu Srinivasan is a Knowledge Management Thinker and a Technology Tinkerer. His specific passion is in Management 2.0, which attempts to elevate management practice by focusing on amplifying Human Capabilities rather than on merely aggregating them. He calls this effort the Connected Intelligence, i.e., connecting the individual intelligence to the collective. He draws inspirations from ant organizations and other sub-human organizations and derives principles that can be applied to human organizations. He regularly writes a blog called connected intelligence at blog.amusecorp.com.

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