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Notch 8 to the Golden Run: Right Decisions, Right Time, Right Authority Part 3, Essential Success Factors

Sonia Bot, Sheppard Narkier, David Sherr, William C. Vantuono

William C. Vantuono:

Welcome to this edition of Rail Group On Air, the podcast series brought to you by Railway Age, Railway Track & Structures and International Railway Journal. I’m William C. Vantuono, Editor-in-Chief of Railway Age.

This is Part 3 of our Notch 8 to the Golden Run series. Part 3 is the conclusion, Essential Factors for Success. We have Sonia Bot, Chief Executive of the BOT Consulting Group Inc. Sonia is very familiar to us as a Railway Age contributing editor and is one of the more accomplished women in our industry. We have Sheppard Narkier, Chief Enterprise Architect and founder of CandleWall LLC. Sheppard is familiar

to us also as he co-authored with Sonia Bot “Anticipating and Avoiding Unintended Consequences in Digitalization” in May 2021. And joining Sheppard and Sonia is David Sherr, CEO of Evolved Supply Chain, headquartered in the San Francisco Bay Area. David made his Railway Age debut in Part 1 of this series.

This three-part series is based on the book “*Dynamic Multi-Level Decisioning Architecture: Making the Right Decisions, at the Right Time, with the Right Authority for Sustained Competitiveness and Relevance.*”

In this series, Sonia, Sheppard and David are inviting us all to step into a bigger story of how our industry evolves in the throes of digital disruption and other external forces. This bigger story is about the role people play in decision-making at all levels of an organization. Sonia, Sheppard and David will reveal how decision-making needs to flow better upwards and downwards, tying the boardroom to the railroad yards, transloading facilities tracks, and indeed the whole rail network and transportation ecosystem. That bigger story is about agency over your domain of control and how each stakeholder needs a better understanding of how to make the right decision at the right time with better and more focused knowledge enabling that allows people to apply their hard-earned wisdom to make better decisions with better and traceable outcomes.

Part 1 of our series covered what this is and why it’s important. In part two, we covered the Business Environment as a Service (BEaaS) platform. Here in part three, we will cover essential factors for success in evolving into a dynamic multi-level decisioning architecture, which translates to making it easier for anyone in an organization to make decisions more consistently, more timely, with more confidence and knowing their impact.

One of the things that you emphasize in your book is that organizations evolve toward multi-level decisioning architectures, so it’s not a “big bang” or “bet the farm endeavor”. Sonia, can you elaborate on this?

Sonia Bot:

The short answer is that evolving to a decisioning architecture, which for example, manifests itself in a Business Environment as a Service platform, something that we discussed in our second podcast of this series – this evolution is a transformational journey. You set your strategy and then you increment toward achieving it in value-added steps and pivot when you need to.

Now, to elaborate a bit, and Bill, you did ask me to elaborate. The underlying strategy, the underlying goal, and the underlying outcome is OT-IT convergence; the convergence of Operational Technology, OT, and Information Technology, IT. And as we also discussed in part two of this series, OT-IT convergence is the cornerstone of the decisioning architecture that enables making the right decisions at the right time with the right level of authority and scope. Of all the strategies and approaches to consider as a mechanism to remain viably competitive, the convergence of OT, and IT stands out as the most promising for sustainable success.

Now, you may also have heard about OT-IT integration. OT-IT integration is a tactic, a manifestation. For example, an OT-IT integration vehicle is a secure digital twin where close collaboration, for example, between OT and IT managers is required so that the secure digital twins are properly defined and structured.

OT-IT convergence is the goal, it’s the strategy, and it’s the outcome. While OT-IT integration is a tactic and a manifestation.

Many studies are finding that OT-IT integration is now the second-ranked blocker for IoT deployment. It was lower in priority in early studies, and we’ll get to that in a second. Now, the top-ranked blocker for IoT OT deployment continues to be security.

What we are seeing is that organizations are starting to learn the realities of the complexity involved when integrating traditional IT and the corresponding business processes with the OT operational processes and technologies that often involve legacy hardware that isn't easily changed or easily configured on the fly.

To mitigate and leverage this, organizations must learn the importance of a proper OT-IT convergence strategy before diving into OT-IT integration. This would include the collaboration of OT and IT staff, which would facilitate breaking down the walls of the silos that have traditionally divided OT and IT.

What we have is an explore and discover component to this effort, and the exploration and discovery must be done in a strategic, systematic and controlled manner. And I always insist that each step must deliver value to the business in order to reap the benefits early, in increments, rather than hoping for a big bang of benefits at the end of what could be a long journey. In my experience, this is the approach that has the lowest risk and can achieve the greatest benefits, and it is essential for a successful outcome.

William C. Vantuono:

In your book, you present a number of essential success factors for equipping an organization with a decisioning architecture that enables making the right decision at the right time with the right level of authority and scope.

You refer to culture and governance as one of these essential success factors. Tell us more about this, David.

David Sherr:

The priority and challenge with OT-IT convergence are in overcoming the cultural and governance issues. You have two different teams with different priorities. For example, uptime and safety for OT and privacy and security for IT. Motivational currency is vastly different. For OT, it's hardcore grit. While for IT, it's technological savvy. Historically, as these two organizations work in silos, there has been little collaboration or mutual understanding in their standard priorities, in their values and in their working styles.

The most significant impediment to overcome in advancing collaboration resides in addressing the two different cultures and their respective characteristics that have evolved. Those cultural characteristics embody different value systems, language, behavioral norms, management styles, and, of course, employee personas.

Even though both organizations have developed different behavior and value systems, the underlying principle for working motivational currency is T-R-U-S-T, trust. That is, trust with its three aspects needs to be developed: (1) trust in one's ability to have agency over the scope of control, (2) trust in the data, knowledge and information that decision-makers must rely upon to make decisions, and (3) that trust must now be extended and dedicated through working across the OT and IT silos. The importance that trust must play in the integration of these two silos cannot be understated.

I repeat, the integration of these OT and IT silos cannot be understated. Behavior engenders values. In Aesop's Fable, the fox can't jump high enough to get the alluring grapes, so he concludes the grapes were sour anyway and walks away. Values guide behavior and underpinned culture and opinion. Any firm gets the behavior they pay for or chooses to ignore. The result of not rewarding desired behavior produces ad hoc values derived as needed. It's not just about compensation though, but about recognition and respect as well as agency and accountability. In the case of railroads, most importantly is the mandate on safety as a first principle.

Sonia Bot:

David, you bring up some good points here. I'd like to emphasize that OT and IT leaders and personnel must become process and data literate. A first step is that they need to learn and understand the jargon of each other's functions.

For example, the term *change* for an OT person would mean a modification to a design, whereas *change* to an IT person would suggest a modification to the management environment. So, for example, when OT powers off a networking device in the field, that is not considered a *change* for OT since there's no design change. However, for IT, this is considered to be a noteworthy *change* since it impacts service. More specifically, as an example, powering on/off a chassis that hosts the WIU (wayside interface unit) functionality during an S&C maintenance operation would not be considered a *change* by S&C (that is, OT), but is definitely a *change* in the eyes of IT because it impacts service.

Imagine the problems that occur with these miscommunications. I see this all the time. And on top of that, the possible and even real impacts that such miscommunications have on operating effectively, reliably and safely.

All this means that leadership at all levels must now learn to deal with the unknown and the unpredictable. These leaders must re-imagine the priorities for what the company stands for and what it wants to achieve, and then empower both OT and IT to strive for the same shared vision rather than viewing OT and IT as cost center. Especially now in the age of Industry 4.0, IoT and digital disruption, IT becomes one of the critical assets to achieving business goals.

So, what we need are Industry 4.0-savvy leaders that will encourage OT and IT to understand each other's challenges, objectives and particular language through, for example, a detailed walkthrough of their processes or job shadowing so that internal silos can be broken down in order to facilitate the seamless achievement of collective outcomes.

Sheppard Narkier:

Thanks, Sonia. Really good points and I'd like to be able to build upon those ideas that you presented while elaborating on some points that David made.

The reality for large organizations adding new significant capabilities means adjusting the culture. Culture includes expected behavior, norms and well-defined values that govern that behavior. Now innovation requires new behaviors such as being ready for this creative destruction, which is the deliberate dismantling of long-standing processes.

This can be very scary, so why do it. For starters, some processes inhibit large transformations that pave the way for innovation. The focus must shift to improving methods of operations and production, and sometimes this requires more than a patched workaround, which sadly is a typical approach. Now this is a big deal because it affects the mindset of people who have been comfortable operating in silos.

It's about breaking apart your comfort zone. This is critical to understand because changing these entrenched processes across domains of control will create uncertainty and some pain. No one likes pain. No one likes the prolonged sense of uncertainty from the norm, either. And we're going to get to that part about the norm later.

So, as we need to be mindful of that in any industry, but especially in rail, as safety is a first principle in any endeavor. This includes the value that specialized knowledge of legacy processes and technology holds. We know that key stakeholders have deep personal investments in processing that knowledge. Change creates fear. Yet it's clear that coordinated efforts from multiple stakeholders as David and Sonia pointed out, are required to bridge these silos. We need teams of such stakeholders. These teams

would need to create a common language that would encompass the concepts from several domains that are the target of an IT -OT integration.

Sonia pointed this out earlier. These projects will only succeed if they are run by multiple multidisciplinary teams that are ready for this; sponsored and overseen by an executive that will be held accountable. These teams will be designated as change agents and publicly advertised as such, These change agents would identify the latent needs and opportunities, build a pilot and then scale it.

Now, these change agent teams would initiate and scale special projects regularly. They would require continuous active executive sponsorship advocacy and resources. This advocacy is especially significant because the successful scaling would affect the processes where all revenue is generated, for example, such as in the delivery of products and services.

These changes would also affect corporate governance. Corporate governance must become an enabler business strategy instead of the typical role that it's often seen, which is an inhibitor of strategy. The various arms of corporate governance are often feared and disdained by those chartered with introducing significant change. It is critical that a member of corporate governance must be part of each change agent team so they can understand and then guide the teams early in the process.

This is why active executive sponsorship is a critical success factor in any change engine process. Executives must balance competing needs and spheres of influence.

David Sherr:

You make a very good point here Sheppard, and I'd like to emphasize that this change in mindset will require unlearning the premise that once the special project is done, everything goes back to the old normal. No. It is this creative destruction approach that frees resources, which can provide funds to create the new normal.

Initiatives are comprised of projects that implement change in how the organization works, and thus change is not a one-time extraordinary occurrence. The change comes in waves of fits and starts. The better each initiative builds a part of the new foundation; the faster changes will occur and persist. Sustainable evolution is a self-propagating wave through the enterprise.

William C. Vantuono:

Now, you mentioned that cybersecurity is another essential success factor for equipping an organization with a decisioning architecture that enables making the right decision at the right time, at the right level of authority and scope. Tell us more about this.

David Sherr:

Well, certainly Bill. Let's put governance and culture aside for the moment. Cyber security takes on heightened need as organizations embrace this journey towards a dynamic multi-level decisioning architecture. Mainly because all aspects of process and technology are becoming distributed. This creates a larger vulnerability footprint for bad actors to generate threat attack-surfaces, as the experts say.

For example, take OT hijacking or data and IP leakage. System compromises spring from three main factors: (1) a growing profusion of inexpensive, (2) unprotected sensors in OT, and (3) more distribution of data, and more diverse network traffic. These factors provide opportunities for compromises at all levels of the organization and its systems.

The increased use of mobile platforms to communicate decisions expands the vulnerability footprint. Issues of data IP leakage become more likely from data at rest in storage devices and data in motion on

internal and external networks. Therefore, there is a greater need to deploy data leak protection capabilities in remote sites and in clouds.

Distributed operations make the effort of providing a secure environment more challenging. But in the entire data stack, positive exploitation of protection opportunities through knowledge becomes a valuable and monetizable advantage. It would be easy to focus the security lens only on sensors or mobile or phone or tablet access, which are essential. But, this would only address surface symptoms. Deeper root causes of security failures must also be addressed to avoid OT and IT stepping on each other's toes. These root causes are primarily human error combined with the siloed systems, processes, and skill sets.

Sheppard Narkier:

David, you hit upon a vital raw nerve for many as they view the rapid pace of change in technology. All the technical steps you mentioned are essential, but they will fail to provide the needed protection without corresponding processes and skills.

I want to emphasize that the establishment of a zero-trust architecture is considered a complex mature initiative. As an example, it is created in increments by combining advanced technology with new processes and improved employee skills.

Our collective experience has been that corporations are more than willing to buy technology but consistently undervalue the need to enhance the needed technical skills of their employees. Worse, they do not feel comfortable ripping apart key processes, which in turn will limit the value that the new technology can bring. A zero-trust architecture relies on some core capabilities, and they are complex.

Here are a few thoughts on what will be needed. Enhance identity governance, which means well-defined policy-based access controls, but that means a single source of identity and it has to be strong. Yet zero trust must be distributed but have a single source of truth for identity, a difficult balancing act. User and machine authentication are table stakes. Rigorous policy enactment, but it must be able to be securely changed as needed. Access control is the first principle in a number of key areas with applications, you have to have it within an application, and you have to be able to have it to get to an application. Now let's add cloud deployments to the list of challenges for zero-trust and a whole new world of opportunity and threat manifests. We also need micro segmentation and networks to limit attack surfaces. This is an ambitious listed indeed, and it's not the only parts they employ several skilled domains.

All these capabilities must be augmented by redesigning processes and updating the skills of key personnel. The skills upgrade is not just for local operators but employees at all levels of the organization. No matter how much technology you buy, the need to completely reassess your processes and skills will become apparent if you proceed without a clear understanding upfront. You will discover this painfully.

We describe how important this is in the book. We created diagram flows and a context diagram showing the many layers involved in decision-making from the rail yards and loading docks to the boardroom. Now as streaming sensor data travels up the stack, getting cleansed and refined into knowledge and then sent back to devices in the form of commands to take, it becomes very clear how important it is to invest in processes and skills to constantly improve cyber security.

William C. Vantuono:

You mentioned that system safety and system reliability are other essential success factors for equipping an organization with a decisioning architecture that enables making the right decision at the right time with the right level of authority and scope. Tell us more about this aspect, Sonia.

Sonia Bot:

In our experience, we find that system safety is currently left as the elephant in the room, especially for industries where system safety is becoming a new reality.

Design discussions are emerging amidst this reality that raise significant concerns and issues.

For example, how do we know that new solutions and systems are safe and that there are no lurking issues? How do we know that integrating multiple components from vendors, partners, and even within existing systems meet safety objectives? How do we know if integrity is preserved after a change is made? How do we shift the legacy status where safety moves from a cost center to a value-added business driver?

These concerns are very real and addressing them requires a significant evolution in culture because culture drives the value system, which in turn drives the behavior from the boardroom through all the management layers and then to the railroad yards, transloading facilities and the tracks for example.

You cannot distribute decision-making effectively without everyone understanding how safe the information and the decision flows are.

There's good news here. The good news is that well-established system safety and system reliability methodologies exist. And even better, these methodologies can elegantly fit into system development and system integration lifecycles, such as V-model, Disciplined Agile and DevOps.

Some examples of well-proven frameworks and methodologies for system safety and system reliability include: SMS (safety management systems), STPA (systems theoretic process analysis), hazards analysis, reliability analysis, and there are a bunch more. Plus, these days, system safety and system reliability are evolving to integrate AI (artificial intelligence) where the inherent stochastic and system design-based approaches allow us to address far more risks and manage uncertainty to much higher levels than the traditional deterministic and non-system-based approaches. More good news as we can utilize and benefit from the power of properly implemented system safety and system reliability as they are today. Plus system safety and system reliability are the foundation for how safety and reliability evolve in the future with the use of AI.

What I'd also like to point out is that these methodologies address the various levels of safety and reliability. And these levels are important. These levels include: component failures, subsystem hazards, functional hazards, operating and support-related hazards, software anomalies, system safety, and system of system safety. And on top of that, for leadership folks, there are methodologies such as Bow Tie Analysis, which would provide a simple end-to-end view of faults events and mitigation threads, which then drives a better understanding of cause-effect relationships so that decision-makers can readily see safety and reliability risks and value creation opportunities.

David Sherr:

Sonia, that's a formidable list of issues, techniques and methodologies! Now, let me note that sensor-based technologies and machine learning analytics can add rich and useful detail to all the improved system safety approaches as well as to cybersecurity. This helps drive the flow of data refinement and enrichment so that all stakeholders have better decision-making tools at their disposal. This approach fosters safe experimentation of the impact of outlier cases, and it's all done with the aid of secure digital

twins. To finish my comments here, it will become more critical as global warming and geopolitical forces play a more significant role in impacting strategic decision-making.

Sheppard Narkier:

Excellent points, Sonia and David, but we all know it doesn't stop there. We know that industries are required by regulation to address both system safety and cybersecurity. Yet all complex safety systems, have residual design, faults and vulnerabilities. We know they will be subject to hostile acts during their lifetime. We know that when they were designed, there was only so much you could imagine about potential threats.

Rapid technology change means new opportunities for threats. Designs, especially for OT, which are more control and sensor based, have to be designed with an incredibly tight requirements and that rarely allows for easy or rapid change, especially in the rail industry. Yet we know that more than ever systems must be able to defend themselves to prevent propagation of failures and vulnerabilities that cause harm and loss. This is especially significant in the rail industry. This means that multiple tactics of redundancy must be built in but must be flexible enough to be changed as a system learns more key as a system learns more.

Think back to the last podcast when we stated that closed loops have defined the basic flow for a self-learning and self-healing architecture. This means that the role of IT integration with OT becomes more important as it must take on the major role of learning in order to be able to have a chance of self-healing. We have seen that the emerging discipline of chaos engineering is impacting the thinking of software engineers. Its purpose is to encourage practitioners to experiment with complex failure scenarios through the use of software as opposed to ripping out wires. The intent is to codify policy changes that will be enacted in code to be able to have a better chance of reacting in time. And this is significant because it's a departure from finding extensive instructions in some dusty manual that's sitting on a shelf somewhere when an emergency occurs.

Sonia Bot:

That's a very good point you make Sheppard, which leads to the integration of system safety and cybersecurity. This is a reality that must happen in this age of IoT and digital disruption. Integrating system safety and cybersecurity is essential for successful outcomes.

A starting point is integrating the safety engineering discipline with the cyber engineering discipline across their end-to-end life cycles.

During the design and development stages, you need to ensure that systems are safe and secure by design.

During the operation and maintenance stage, continuous learning and continuous adapting, along with real-time predictive modeling, reduces the probability of mishaps. As data is aggregated and refined, varying levels of knowledge and wisdom and insights can be applied to the problem. The codification can then be integrated as policy and, where appropriate, added to the digital twin agents (and in our case, secure digital twin agents) as policy enacted in code.

William C. Vantuono:

Well, I have to say that all of this sounds like a journey

Sheppard Narkier:

That's right, Bill. OT-IT convergence is a transformational journey with many moving parts to date. There is no standard roadmap, organizational structure or template for converging OT and IT, The journey is up to each company to find its right solution and ensure that it aligns with the ecosystems they connect into.

It is essential to realize that any defined roadmap for any industry should only act as a framework. It cannot be considered set in stone. The very essence of our podcast and book makes that clear. Digital disruption shortens the decision-making timeframes in all industries. The needs of each division in an organization must be tailored to some core principles in this new sensor driven decision-making process. These principles most focus on the operational requirements and constraints, the design principles and opportunities related to business needs and requirements

David Sherr:

And Sheppard, on the heels of what you detail, the good news is that there are solid practices in place to make safe IoT all happen as cars and trucks become computers on wheels. To avoid episodes like the one in 2015 where hackers demonstrated a proof of concept for taking complete control of an SUV by hacking into cellular connected components and then compromising the vehicle's entire sensor data transmission system. Imagine this scenario as locomotives continue becoming whole data centers on wheels.

This generalizes and speaks to our particular emphasis on OT-IT convergence. It demonstrates that even things traditionally thought of as "dumb" OT equipment provide IoT attack surfaces when connected to the internet.

Let's drill down into safe operating Business Environment as a Service. Expanding Sheppard's earlier points on zero trust is the best practice in tighter security. Zero-trust includes (1) multifactor authentication, (2) time and use and time limited role-based access control, and (3) the best available encryption for messaging and data at rest or data in motion.

However, we must accept the reality of our starting point today. We see OT and IT silos with islands of processes, proliferation of devices, disparate and incompatible data, unintegrated legacy systems, diverse ecosystems and differing if not opposing priorities.

So, I cannot stress enough that this requires fully committed, aligned, transformational, and disciplined, experienced leadership. I would also advocate engaging with the best-in-class experts that are solidly grounded in academics and science of the methodologies from their training and experience. These experts would have solid track records as practitioners in digital transformations.

William C. Vantuono:

What are some of the moving parts or dimensions involved in this OT-IT convergence and transformation?

Sonia Bot:

This is an insightful question Bill, especially since I see a lot of organizations pile it all into one big smashed up heap.

There are a number of moving parts, dimensions to this. And the order is very important.

First and foremost, we must always keep in mind that the business objectives drive each of the dimensions.

So, the dimension that we start with is process convergence, which requires that OT and IT organizations revise their processes, workflows, and procedures to support the modernized ways of working and operating together.

Once this has been designed and defined, then organizational convergence may be required, such as creating aligned organizational structures. Now, make note, if process convergence is not done first, then regardless of new organizational structures, people will continue to behave according to the existing processes, the “old” processes, which renders the new organizational structures ineffective and subject to re-work.

The next dimension is the convergence of software and data. This is about getting software and data to directly address OT needs. Again, make note, if process convergence is not defined beforehand, the software and data run a high risk of not meeting the OT needs and then requiring re-work. As well, for this to be successful and future-proof, data and software must be decoupled so that the data and software are able to adapt to an ever-changing business environment.

Also, there may be a technical convergence that deals with aligning or modernizing the network architecture.

What follows is a physical convergence, which includes physical devices being retrofitted or combined with newer hardware to accommodate the addition of IT to OT.

And subsequently there is an operational convergence where the hardware is maintained and updated over time.

So, you see, there’s an order to this. Recapping: business objectives process, organizational software and data, technical, physical and operational convergences.

And for those of you that are wondering about this being one forever long waterfall, be rest assured that highly experienced professionals in complex systems and complex transformations know how to navigate through this in lean, low risk and value-added increments. And this is a topic for discussion for another day.

In parallel to all of this, the OT-IT convergence must remain in sync and aligned with opportunities for business expansion such as refocusing target markets, or developing new products and services, or creating new alliances, or responding to new regulations, and so on and so forth. These two are driven by the business objectives. The business objectives are the common denominator in all of this.

William C. Vantuono:

You know, listening to this and thinking about the journey we’re talking about it brings to mind one of my favorite movies. It happens to be a kid’s movie, but if you love trains or if you’re a railroader, I think it speaks to you. It certainly speaks to me. It’s the “*Polar Express*”. It’s a great Christmas movie, and there’s one scene in the movie which I love. It’s at the end where the conductor, who’s played by Tom Hanks, he says to the little boy who’s the main character, “One thing about trains. Doesn’t matter where they’re going. What matters is that you get on.” I love that!

Now, in your experience, what gives the best transformational results for organizations to evolve into a decisioning architecture on their journey?

Sonia Bot:

That's the billion-dollar question Bill! Based on my direct experience with OT-IT convergence and other transformational mandates in various industries, including rail, the best transformational results occur when taking an approach that both improves organizational effectiveness and positions the organization's target markets and product service portfolios to outperform. It's the simultaneous top-line and bottom-line approach.

In my experience, most organizations stop short of transformational change by focusing on improving operational effectiveness such as productivity improvements and asset rationalization. This is a reliable approach when delivering fast results to improve the bottom line, but it does not make a transformation successful.

So, it's important to approach this as what is referred to as a full-scale transformation, addressing both the top-line and the bottom-line simultaneously.

And we must also always keep in mind the broader context. So, with process and technology advancements and everything under the digital disruption umbrella, plus the myriad of the ever escalating external forces, organizations and industries are really being pressured to deliver even better and faster bottom line results, plus stronger financial returns, while working in ways that are completely new.

So, by taking a simultaneous and a complimentary top-line and bottom-line approach to transforming the operational effectiveness, improvements carry the organizations to their next set of portfolio offerings and market moves, which in turn creates the momentum for moving organizations to the next level.

William C. Vantuono:

You know, it sounds to me that this can be kind of daunting for organizations to face. So, what are your thoughts on this

Sheppard Narkier:

I'm glad you asked that Bill because that's a question for many executives right now. This does not have to be daunting for organizations in our experience. It all depends on how you approach it. You must be systematic, judicious, and strategic in how you scale and pivot through a sea of change. You also need to understand your organization's values and external threats and the opportunities it faces. The reality that there are no standard roadmaps for this transformation has a few critical advantages.

An organization willing to take on this challenge can become a disruptor in their industry or an adjacent one. This is the primary goal of most organizations, to build sustainable competitive advantages and thought leadership. This does require fortitude to experiment. To do that, teams must fail fast and small and use the benefits of the real-time decision-making architecture that they're building, which includes built-in metrics and flows that help teams learn.

In the prior podcast, we talked about how that architecture can create a self-learning, self-healing system. This is a big deal. It's a game-changer. Use this architecture to create the capabilities that will help all stakeholders to understand what is working and what is not. That competitive reality has consequences, as we mentioned before. It means embracing change as the norm. That means hiring, enabling, and promoting those who can support the new spirit of the times. It also means that executive leadership must own the sponsorship of these journeys. There is no backing down from that fact.

David Sherr:

Well, Sonia and Sheppard, that's sure a lot to get our heads around. Nonetheless, a transformational journey for OT-IT convergence can be reliably achieved through the collective use of such practices as Lean Six Sigma. Innovation through entrepreneurship, data-driven business precision, comprehensive digital transformations, and fit for purpose organizational architecture and behavior. These practices fully support the dual nature of improving operational effectiveness and positioning the business to become something it has not ever been before so that it can outperform itself and its competition.

William C. Vantuono:

One of the most important takeaways from this entire discussion is the importance of instilling a continuous change mindset in organizations. What are your thoughts on this?

Sonia Bot:

That's a very good point, Bill. It is very important to instill a continuous change mindset in organizations and industries at all levels from the board of directors through to the operational core. This involves learning and unlearning as a pillar of the corporate culture. Designated multidisciplinary change agent teams are essential for success. And executives must be relentless in their sponsorship, their tracking, and their support.

David Sherr:

I'd like to add, Sonia, that organizations also need to weave in guiding principles around learning and unlearning as part of their capability maturity model. This is all done while refining the data upwards through the processing hierarchy so that applied wisdom becomes a natural capability. The upward flow drives the new level of strategy and implementation.

Approaches that include the evolution of process architectures, hybrid cloud migration, data normalization, data maturation through to wisdom and even stakeholders' compensation just to name a few strategies for monetizing data and processes need to be integrated, thus, enabling strategies for moving towards a circular innovation and 360 degrees sustainability instead of the more traditional linear innovation in parallel to integration.

The urgency is for, as you point out, executive sponsorship accountability and support for the proper governance of platforms and ecosystems. This urgency must remain top of mind as these activities that fuel sustainability in a shifting landscape of increasing competitiveness.

Sheppard Narkier:

What happens when learning and, especially unlearning, are not applied?

Considering the significant role digital disruption plays, it forces us to accept that we cannot ignore technical debt. You can think of technical debt as a failure to unlearn.

Most legacy systems already have technical debt, where their maintenance often consumes 80% to 90% of OT/IT budgets. Yep, you heard that, right.

What if organizations don't act on addressing their technical debt? Then they're rolling out of IoT will worsen and spread technical debt. Why? Because of the sheer volume and speed of deployment required to get the basics working. It will be the top of mind for executive sponsors.

Technical debt will increase because to get the basic IoT functionality in place, more workarounds and patches and temporary fixes will be put in place to meet publicized milestones. It is part of the evolutionary process that an organization must learn and change.

Making mistakes and shortcuts to get something done are the usual modes of work, but the opportunity to fix these changes will get buried in the exciting new work. This cannot be ignored as it will slow any significant change journeys. It will waste precious time and resources. It will delay the ability to defend against threats or leverage opportunities. This is the ultimate irony. Everybody thinks they're making big changes until the pilot projects are over.

William C. Vantuono:

All right, well, I think we're about ready to wrap up here. David Sheppard and Sonia, how about some parting words for today?

David Sherr:

Sure! Thanks, Bill! I'll be very prescriptive here to determine the sources and causes that resist changing the well-established status quo.

Study the relationship and motivations of all parts and people in your organization for once you begin to fall behind, it gets increasingly harder to catch up, let alone improve and innovate. Like a shark, always keep moving or you die. Take small steps and evaluate and change course many times if necessary. And remember, the steering wheel in a moving vehicle is easier to turn than in one that's standing still.

Sheppard Narkier:

Good point, David. If you don't intelligently plan for change, change is going to come for you, and it will be painful. We have seen it over these last 20 years. Digital disruption is challenging how many large corporations think about growth and sustainability. Other forces are at play, and they are just as merciless.

You don't have to and should not do this alone. Be open-minded about partnerships and ecosystem participation. Analyze and plan but be committed to move forwards. But to quote Earnest Hemingway here, "don't confuse motion for action."

Sonia Bot:

And speaking about action, not to be confused with motion, as Sheppard quoted Hemingway... In this three-part series, we invited you all to step into a bigger story on how our industry evolves in the throes of digital disruption and other external forces.

This bigger story is about the role people play in decision making at all levels of an organization.

If there's only one thing that a company needs to master, then learn to master decision making.

Now, the call for action. It's your turn to step into the story. How well will you play your part?

We invite you, the listeners of the series to reach out to us with your thoughts. We'd love to hear from you as we all evolve through this and as we all evolve through the next generation of railroading together!

William C. Vantuono:

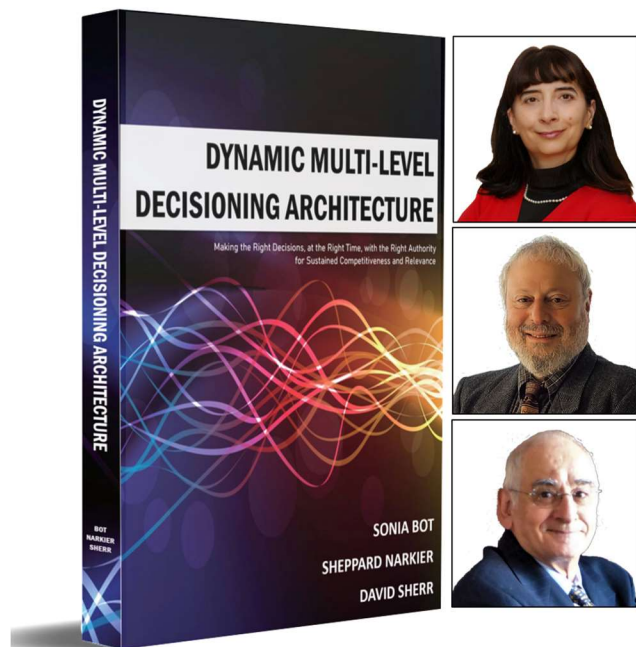
Well, Sonia, I'd like to thank you very much, and also David and Sheppard. You know, I think this Notch 8 to the Golden Run series has been very useful for our audience, our railroad audience. You know, the

industry is in a period of change, a period of disruption of various forces acting with it and against it. As, and we'll see how things play out over the next year. As you listen to this, it is 2023.

I'd like to again mention the book that this series is based on. It's "*Dynamic Multi-Level Decisioning Architecture: Making the Right Decisions at the Right Time, with the Right Authority for Sustained Competitiveness and Relevance.*" Now for a limited time, the e-version of this book is free to friends of the authors, and the Railway Age audience is always a friend of our authors, today and every day. Now, all you need to do, if you want to download a copy of this book is to go to the website, <https://botgroupinc.com/featured-content>. That's all you need to do to download and there are no forms to fill out, unlike a doctor's office. We keep it very simple.

Thank you very much. That's it for this series. Have a safe day.

ARTICLE: <https://www.railwayage.com/cs/notch-8-to-the-golden-run-part-3-essential-success-factors/>



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