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Artificial Intelligence Dangers in Supply Chain Management

What Will You Do When Your Supply Chain Professionals "Outsource" Their Curiosity & Imagination to AI?

by

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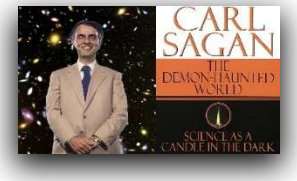
When thinking about artificial intelligence (AI) and its impact on manufacturing, distribution, and logistics industries (and complex, multi-tier global supply chains in general), I cannot shake the uncomfortable and prophetic predictions presented by Dr. Carl Sagan in his 1995 book, "*The Demon Haunted World.*" He wrote:

> *"I have a foreboding of an America in my children's or grandchildren's time - when the United States is a service and information economy; when nearly all the key manufacturing industries have slipped away to other countries; when awesome technological powers are in the hands of a very few, and no one representing the public interest can even grasp the issues; when the people have lost the ability to set their own agendas or knowledgeably question those in authority; when, clutching our crystals and nervously consulting our horoscopes, our critical faculties in decline, unable to distinguish between what feels good and what's true, we slide, almost without noticing, back into superstition and darkness."*



Sagan continued: *"The dumbing down of America is most evident in the slow decay of substantive content in the enormously influential media, the 30-second sound bites (now down to 10 seconds or less), lowest common denominator programming, credulous presentations on pseudoscience and superstition, but especially a kind of celebration of ignorance."*

You might be asking, *"why have I begun a discussion on AI in supply chain management with Dr. Sagan's quote… a quote that seems to address a much bigger, predictive view of society?"* You might also be asking, *"why such a skeptical view of the future?"*

I begin this way because substantial evidence exists to suggest that many supply chain professionals lack the fundamental knowledge and logic capabilities to appropriately utilize and operate advanced AI tools in the supply chain management space. Paraphrasing Dr. Sagan (with a few liberties), the theme of my discourse is that "*when supply chain professionals lose their ability to set agendas or knowledgeably and logically question traditional*

supply chain management concepts, lessons and experiences, they will be playing with decision support fire when using these uber-powerful tools."

It is my belief that when integration of skilled people is removed from discussions around potential AI uses, AI becomes largely unworkable in a complex and ever-changing world. AI after all, is just a technology. It is not a pure solution or an invention that belongs on the *"periodic table of society-altering innovations."* And yet, I have a deep sense that when such a powerful toolset is combined with deeply knowledgeable and logic-focused critical thinkers, it CAN BE society altering. It can amplify trajectories and performance. I like to think of effective AI as *"Augmented AI"* (AAI). **And what is AAI? It is a creative and decision-making ecosystem that appropriately marries highly skilled, knowledgeable, logic-centric critical thinking professionals with AI tools.** AI is the technical tool. The knowledgeable professional with deep logical understanding is the augmentation. Approaching AI this way not only keeps the professional in charge, but it multiplies the benefits while reducing the risks.

Let Me Explain

First off, I am not suggesting by Dr. Sagan's quote that global supply chain professionals are dumbed down, ignorant, or lack basic skills necessary to understand the context of complex supply chain systems. I am however about to make a case that decision support technology is advancing faster than the average supply chain professional can adapt. I will also make a case that with AI, unlike with any prior societal-level innovation, successful application and majority adaptation cannot be advanced through incremental training alone.

To use an overly simplified analogy, think about asking a bright 12-year-old to effectively use a graphing calculator, even though the child has not been exposed to any substantial amount of higher-order mathematics. Using such a calculator requires an ability to solve equations and manipulate variables. This requires a deep understanding of fundamental calculus concepts such as limits, derivatives, and integrals. Additionally, familiarity with trigonometric functions and statistics is useful for graphing data and subsequent analysis. Understanding the purpose of different graphing modes and how to logically interpret graphs is essential for visualizing and solving mathematical problems using a graphing calculator. Elementary-school level addition, subtraction, multiplication, and division isn't even close to being adequate to use such a device.

When we compare this analogy to the state of current supply chain professionals, we can easily conclude that supply chain degrees and certifications may not be enough to satisfy the knowledge-starved digital world where knowledge acquisition is only a click away. This may be even more pronounced when we add algorithmic, generative, and agentic AI into learning and supply chain qualification processes. Now, young professionals skilled in using a suite of AI tools can deploy these tools to expand their curiosity and imagination in ways we never previously thought about… or they can use these tools to obfuscate their need to fully understand underlying logic necessary to solve complex, multi-layered supply chain problems. They can become the equivalent of the nuclear scientist who believes that First Physics Principles no longer need to be internalized and retained because they are easily accessible online.

Think about it a bit… the internet, and more specifically the World Wide Web (www), has emboldened people to *"outsource retention."* People generally believe they don't need to remember important principles, equations, logical steps, and crucial supply chain facts. These are always just a click away.

Need to rethink inventory service-level reliability formulas? Click, click, click.

Need to determine the correct international procurement incoterm for a planned shipment? Click, click, click.

Need to determine the best algorithm for stochastic safety stock modeling? Click, click, click.

No need to go to the well-researched and published knowledge stalwarts, including those who shaped industrial supply chains in strategic, tactical, big-picture, short-term and methodological ways. Just use AI… or not. Unfortunately, this technologically driven outsourcing of retention often leads to deficiency in comprehension.

Let me explain why AI may not be the best substitute for deep logical understanding of supply chain driving principles.

Origins of Supply Chain Knowledge

I am not interested in providing a comprehensive historical perspective on the sum of major supply chain thought-leaders, at least at this time. I do however want to stress how important it is to understand that supply chain logic in both strategic and tactical terms has been under development for an exceedingly long time. The Mesopotamians, Egyptians, Greeks, and Romans developed extensive trade routes, including the Silk Road and later Spice Routes to exchange goods like spices, cloth, and metals. Factually, supply chain knowledge dates to about 3000 BC. It is this rich and additive history of supply chain knowledge that seasoned professionals draw from when solving complex problems. This is also what AI (with machine learning – ML) ultimately must draw from.

Modern supply chain structures and all the standard techniques in supply chain management trace their roots back to the early parts of the 20th century. Since the early 19-teens, supply chain management techniques and technologies have been on an ever-accelerating trajectory. Most have taken the form of technology tools and information systems, including MRP, MRP II, and now ERP and adjacent systems. At the same time these technologies were grasping at the cerebral cortexes of supply chain professionals, crude AI tools and applications began to develop. Think about intelligent spell-checking applications and grammar recommendation apps. Think about electronic editing systems first used by newspaper and magazine publishers to move beyond manual and labor-intensive lead-based typesetting. Think about cell-phone texting applications that propose next words while thumbing an instant message to a colleague. All of these have been incorporated into the daily lives of supply chain professionals doing their supply chain jobs. They were all based on algorithms.

This trajectory has resulted in a plethora of mental models, formulas, polices and guidelines that are as important to global supply chain management as the laws of physics are to understanding the universe. This is to say, it is important to staff a company with supply chain professionals who have a passion for these *"Laws of Supply Chain Management"* and an appreciation for inviolate models and formulas. It would be these models and formulas that inform their thinking when solving unfamiliar supply and demand problems. And just as Elon Musk has talked extensively about revisiting *"First Physics Principles"* to shift technology constraints, it is the mental models, formulas, policies, and guidelines developed by the great thinkers in our complex and often overwhelming industry, that we perhaps need to revisit.

Many supply chain scholars and thought leaders of the last 100 years have left us with a rich pallet stacked high with tools to solve supply and demand problems, albeit arguably slower than when deploying AI tools in similar problem-solving quests. **Every one of these thought leaders has provided our profession with a model,**

technique or technology that is STILL useful. If we don't study them, we won't get the advantage of settled supply/demand management logic. We won't know *"how"* to ask AI to assist us. More importantly, we won't have a validation reference.

Borrowing from the mechanical engineering discipline, every AI-generated solution pivots around a single datum - the irreducible truth that knowledge, no matter how vast, must be anchored to one clear point of meaning. This frames *datum* as the foundational truth, the nucleus around which the complexities of AI outputs orbit. Do we have supply chain professionals who can identify their *"datum"* to validate AI proposed solutions?

Personal Experiences With AI Tools

Because I have studied the stalwart authors of what I call *"supply chain physics,"* I tend to use currently available AI tools more effectively than most in the supply chain profession. Plus, the disparate teachings and models provided by the great supply chain management thinkers, inform me in how to more effectively create the critically inescapable questions to challenge my AI tools to best assist me in solving complex global supply chain problems.

A big takeaway here is that for supply chain professionals to formulate critical and inescapable questions, they will need to study these same scholars and their contributions to the supply chain body of knowledge (BoK). At the risk of appearing too academic, I have provided at the end of this briefing a list of TWENTY-FIVE deep thinkers who inform me daily and in multiple ways. Irrespective of the promise of AI, there are no substitutes for knowledge and experience when solving complex problems and making critical decisions. I can personally attest that there are NO global supply chain problems that I address in any of my consulting and teaching practices that fail to draw from one (or more) of these great thinkers and their contributions.

And though the list is informative, it seems to have been largely ignored by many supply chain careerists. Apparently, the promises of global supply chain management excellence are now driven, not by understanding deep logic and its origins, but through the WWW! I am often told that *"www will find your solutions."* It seems that early-career supply chain professionals have absolutely *"outsourced knowledge retention, and by default, comprehension"* to the WWW!

Now, let's dream a little… add generative AI into the profession and you have skilled supply chain managers who can initiate substantially more complex problems/solution requests, such as:

> *"For supply into my Pasadena, California assembly factory that produces electronic anti-drone signal jammers that are sold both domestically and internationally through unclassified government controlled distribution channels, what electro-mechanical global supply geographies and supply sources should I consider that will optimize my primary procurement tradeoffs (delivery reliability, price, product quality and in-process losses), and my secondary procurement tradeoffs (first-mile, global and last-mile transportation, IP protection and physical goods security,) and what 1st and 2nd tier supply chain risks could manifest for each potential solution, and what are the statistical probabilities of these manifestations for each solution alternative?"*
>
> *Provide and contrast no more than THREE "best" alternative optimal recommendations, with full pros and cons summarized. Also provide a list and rationale for additional input data needed to refine the recommendations further.*

Do you see what could happen here? AI could *"outsource curiosity and imagination,"* especially if the inquirer lacks fundamental comprehension of *"supply chain physics."* AI could enhance decision making… or reduce our

professionals' capabilities to develop mental models that help them to solve future, yet-to-be-defined problems… or even know how to formulate questions to input to an AI instrument. AI can make professionals more effective… or not. It could leave professionals unable to reason through future problems because AI *promises* to do the work for them. But what if AI is wrong? And who fact-checks AI?

Seeing first-hand how young professionals are using tools like ChatGPT, Copilot, Google Duet AI, Google Bard, GhostWryter, Grok, AIStudio, OpenAI01.net, AI.art and Ellie AI, it is clear to me that we are facing a day when supply chain professionals, an indeed ALL working professionals, *could* outsource their abilities to create personalized mental models for problem solving, choosing to use advanced generative AI tools to essentially do the thinking for them. Is this a good thing?

Observations & Conclusions About the Use of AI in Global Supply Chain Management

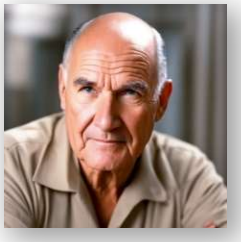
I am spending too much time lately addressing how the convergence of Large Learning Models (LLM), Artificial Intelligence (AI) and Machine Learning (ML) can be used constructively to improve global supply chain design, planning, execution, economic performance, problem solving, catastrophe avoidance, and enterprise resiliency. Over the last 18 months, I have exercised no less than:

- NINE AI-based supply chain management tools.
- More than a dozen AI-based performance reporting disaggregation and aggregation tools.
- Several AI tools focused on unrelated disciplines, including art design, creative writing, lighting design, network optimization, and aerodynamics design.

Though I am still learning, here are FOUR insights I can tell you with certainty in respect to supply chain management and artificial intelligence application:

1. **There are few professionals in the supply chain world who are capable of effectively using these powerful tools.** It's generally not because the tools are complex, in fact the brightest features of these technologies are the highly intuitive human-machine interfaces. They are all simple to operate… and fast to cause damage in the hands of an unqualified operator. They are the proverbial Ferrari F40 in the hands of a 16-year-old male predisposed to stupid risk-ignorant decisions.
2. **Like all systems, (biological, mechanical, electrical, chemical, etc.), LLM/AI/ML tools have some faster and deeper capabilities than humans.** People's skills are mostly outstripped by these new tools. Why? Because early-career professionals have too often been educated in how to DO things, not in how to UNDERSTAND and SOLVE things. They have not developed the requisite logic base necessary to use these tools effectively. They generally do not understand that it's important to know HOW these tools work AND how their domain operates in order to TRUST these tools' outputs.
3. **AI in the hands of people who lack the underlying logical BoK of whatever they are asking of these tools, relinquish their ability to perform basic quality assurance on tool output.** This is EXTREMELY dangerous. Think about Boeing 737 Max software engineers (2011 – 2019) who failed to fully comprehend coded firmware-based algorithmic solutions' impact on flight attitude and flight dynamics. Now multiply this by every company in the world and you have not a singular Ferrari F40 steered by a maniacal juvenile… you have an entire expressway with these dangerous beasts doing dangerous things. Disaster is not a possibility… it is a PROBABILITY… and a high one at that. It likely borders on CERTAINTY.

4. **Historically, Enterprise Resource Planning (ERP) systems have had dismal implementation success rates for these same reasons.** Now we can put ERP on steroids with the certainty that unqualified people will assuredly make much BIGGER mistakes FASTER than ever. This is not what I would call progress!



Robert Heinlein (1907 – 1988), an American aeronautical engineer, naval officer and seminal figure in the hard science fiction genre, can perhaps provide some insights here. Heinlein believed that individualism is incompatible with ignorance. He believed that *"careerists"* could easily be persuaded to take shortcuts which always result in an inability to question the experts of the day… or to think for themselves. He also believed that an appropriate level of adult competence was achieved through a wide-ranging education, focused heavily on facts and logic, which would develop an ability to formulate important and inescapable questions.

It seems that Mr. Heinlein knew that technology requires talented people who can determine the best way to use a technology, in contrast to a technology driving the professionals' actions. My experiences with supply chain professionals using AI cause me to believe that AI is currently and inappropriately driving supply chain management actions… in contrast to a more appropriate driving of AI *by* supply chain professionals, addressing real-world problems using AI tools. This should not be surprising given AI's current *"bright shiny object of the year"* status.

A Worthy & Relevant Analog

Because I know that many of my readers have somewhere between basic familiarity and deep knowledge of accounting principles, I would like to share a recent personal experience I had while teaching basic business accounting. My experience portrays a real-life example of this *"logic-free"* phenomena:

> I had several late-stage Gen-Z students in an advanced cost accounting workshop in 2023. Most of the students had undergraduate degrees in business and/or finance (not accounting). About a third of them had advanced degrees in finance and/or economics. We got off track a bit in one of my evening sessions and discussed a complex financial transaction. I asked the class (in teams) to go to the flip charts and build *"T-Charts"* to explain their views of how the transaction should be characterized and subsequently posted through subsidiary journals and the General Journal. This characterization was important because it would determine how the transaction would ultimately appear in the financial statements… and likely determine its rather significant potential state and federal tax consequences.
>
> To my shock, **more than two-thirds of the class had no idea what a T-Chart was!**
>
> Apparently, these students learned basic accounting using QuickBooks and learned how to unquestioningly believe the software's default posting decisions. It seems my students never learned the ageless LOGIC of double-entry accounting originally presented by Benedetto Cotrugli all the way back in 1457 and thoroughly codified by Luca Pacioli in 1494! Stupid me… I thought you couldn't get a degree in business, and especially in finance, without learning and internalizing this *"most core of all core"* business processes – double-entry bookkeeping. A shocker to say the least.

When I asked my students *"what are you going to do to solve the problem?"* they asked me, *"what ERP system was the company using?"* I was curious about this response, so I asked them, *"why is this important?"* The response from most of them was generally, *"it will be posted based on the way (SAP, ORACLE, BAAN, etc.) was setup."* I asked them, *"who sets up the default general ledger accounts and values in these systems?"* They generally responded, *"someone in IT."*

I asked my last desperate question on this subject, *"is it appropriate for someone in IT, someone whose name and skills you do not know and who likely does not possess enterprise-wide knowledge, not to speak of basic accounting principles, to set default values that drive company performance reporting and does so as 'magic' to you?"*

Their response… *"sure. Why not?"*

This real-world example demonstrates nothing less than gross juvenile-like intellectual laziness… a laziness built off the back of well-meaning technologies in the hands of unqualified people who apparently believe it is acceptable to live in a *"logic-free"* zone. People who behave this way are what makes AI dangerous in a business world that is supposed to measure risks BEFORE every decision.

Generative AI (in contrast to pure algorithmic AI tools) has been known to *"hallucinate."* Like humans, AI tools don't always discern the line between creativity and bullshit. This may be one of the traits that define AI systems as *"human-like."* Just as humans *"liberate"* truth at times and continue to do so until they learn not to, so does AI. This should not be surprising, because this is how the humans who write the AI code behave. They too learn how to believe in their own press releases!

Conclusion

My thesis here is NOT about supply chain management systems. It is about the unprepared people who will use AI tools and blindly believe the output. It happened with ERP systems. Why wouldn't it happen with AI tools? What has changed?

I think leaders should let the small population of genius AI (and adjacent) developers design to their hearts' content, and more heavily focus corporate resources on the early supply chain careerists who without deliberate intervention, could blindly replace their own critical thinking skills (if they developed any in the first place) with ignorant acceptance of these tools' outputs. AI is not the danger - intellectual complacency is. For MBA and supply chain management undergraduate students entering the supply chain profession, the challenge is clear: master the enduring logic of supply chains, internalize the wisdom of past deep thinkers, and use AI as an amplifier of curiosity and imagination, not a substitute for them.

Henry Louis Mencken (1880 – 1956), a provocative author and cultural critic, may have been onto something that is made more relevant by AI when he explored tendencies toward over-simplification that technologies often promise. He said, *"For every problem, there is a solution that is simple, neat… and wrong!"* One must wonder if the intense and massive industrial attraction to AI is borne from a *"groupthink"* desire for simple solutions to complex problems?

AI tools will evolve. I am, however, skeptical that people will evolve without deliberate intervention. I am also worried that a small subset of the population will evolve and will NOT use these tools in a positive manner. Think for a moment about Disney's 1958 film classic *"White Wilderness"* where the lemmings ran off the cliff to their

deaths. Most baby boomers viewed this in school science classes. **The scene was a verifiably deliberate fraud!** Lemmings do NOT commit mass communal suicide… AND they CAN swim! Yet, vast numbers of individuals across three generations still believe this fabricated nonsense.

If people could unabashedly believe this cultural *lemmings-march-off-the-cliff* myth, what can generative AI produce that they will believe without questioning? Look around on social media today. Most of us can no longer distinguish real recorded videos from AI fabricated videos. Fabrication analogs have also shown up in supply chain data bases, industry reports, and news media stories about supply chain issues. It seems we are already living in *"mythland."*

What Is the Big Takeaway from This Briefing?

If your company does not parallel-invest in advancing employee supply chain management knowledge and critical thinking skills, your company's investment in AI will be worse than misspent capital. Poor decisions, made faster than ever before when logic-free employees use AI tools, will do real economic harm to your enterprise. Your company will need to invest in critical-thinking systems and deep logical training in parallel with these exciting and innovative technologies. Companies embracing AI need to embrace employee logic development and maintenance. This means large investments in employees' education, and ongoing training… probably larger than ever before.

As the adage goes, *"pay me now or pay me later."* Everyone knows from experience that *"pay me later"* always comes with substantial disruption and expense.

Great Supply Chain Scholars to Study

If you are going to drill down on AI tools to help you solve problems, I suggest you study these TWENTY-FIVE logic-setters. I am skeptical that any supply chain professional can adequately execute necessary quality assurance on AI outputs in supply chain management without a deep comprehension of the body of knowledge delivered by these great thinkers:

I have listed them in last name, alphabetic order:

1. **Stafford Beer:** Applied cybernetics to management systems, influencing supply chain control and feedback mechanisms – still useful, especially when designing new global supply chains and supporting systems.
2. **Dr. Donald Bowersox:** Often called the *"grandfather of logistics."* He helped define logistics as a strategic business function. He co-authored *Physical Distribution Management*, one of the earliest texts in the field. He pioneered research on supply chain integration, collaboration, and customer service metrics – all still useful. Dr. Bowersox was also a founding member of the Council of Supply Chain Management Professionals (CSCMP).
3. **Martin Christopher:** Professor at Cranfield School of Management, known for his work on logistics and agile supply chain strategy. *"Dr. Agile"* produced seminal works that quantified connections between risk management and customer responsiveness – all still useful.
4. **Phillip Crosby:** Developed the concept and mechanics of *"zero defects"* and led to the definition of *"quality"* as *"conformance to requirements."* The Zero Defects theory is built on the concept of doing it right the first time to avoid disproportionate costs and time spent later.
5. **W. Edwards Deming:** American business theorist, composer, economist, industrial engineer, management consultant, statistician, and writer who was instrumental in developing sampling techniques still used by the United States Census Bureau and the Bureau of Labor Statistics. He is also known as the father of the quality movement and was hugely influential in the post-WWII reconstruction of Japan's industrial base.
6. **Peter Drucker:** Though known for management theory, he emphasized the strategic importance of logistics and distribution - he was ahead of his time and is still useful today.
7. **Frank & Lillian Gilbreth:** Pioneers in time and motion studies which influenced warehouse and logistics efficiency – all still immensely useful.
8. **Drs. Donald Fogarty & Thomas Hoffmann:** Developed foundational frameworks for master planning, capacity requirements planning, and inventory control. Their textbook became a cornerstone for ASCM certification and professional education in supply chain and operations management. They emphasized the integration of long, medium, and short-range planning with execution and control – all still immensely useful.
9. **Henry Ford:** Revolutionized manufacturing with the assembly line, drastically improving production speed and supply coordination. There is probably no industrialist in the history of the world who numerically contributed more performance trajectory-altering methods than Ford.
10. **Dr. Jay Forrester:** Developed System Dynamics at MIT, which helped model complex supply chain behaviors – still useful.

11. **Dr. Jan Fransoo:** Focused on supply chain analytics and humanitarian logistics – His insights still inform and are still useful.
12. **Dr. Eliyahu Goldratt:** Author of the immensely important and still relevant "*The Goal*," a business novel that introduced Theory of Constraints (TOC) to the world. TOC focuses on identifying and managing systems constraints to maximize flow and profitability. He is the developer of *"Drum-Buffer-Rope,"* "*Critical Chain Project Management"* (CCPM), and *"Throughput Accounting."* His ideas shifted planning from local optimization to a system-wide throughput focus. His lessons are still immensely useful in supply chain design.
13. **Dr. Hau L. Lee** (Stanford): Known for work on value chain innovation and bullwhip effect mitigation. Also emphasized methods for demand-driven planning and collaborative forecasting – all still immensely useful.
14. **Dr. Steven Melnyk & Dr. Ram Narasimhan:** Authors of foundational SCM textbooks and supply chain learning frameworks, including some of the earliest thoughts about large-scale Computer Integrated Manufacturing (CIM). Their methodologies in the world of CIM are still useful.
15. **Dr. John T. Mentzer:** His research helped define SCM as a strategic discipline, emphasizing collaboration, integration, supply chain planning as a core process, and S&OP as a bridge between forecasting and execution – all still useful.
16. **Taiichi Ohno:** a Japanese industrial engineer and businessman. Co-creator of the Toyota Production System, which inspired Lean Manufacturing in the U.S. and Just-in-Time (JIT) worldwide. He devised the seven wastes (or muda in Japanese) as part of this system. His focus on eliminating waste and continuous improvement transformed supply chains worldwide
17. **Keith Oliver:** Credited with coining *"Supply Chain Management"* in 1982 while at Booz Allen Hamilton.
18. **Joseph Orlicky:** Authored the first book on Material Requirements Planning (MRP), revolutionizing production planning and inventory control. His work enabled companies to shift from reorder-point systems to netting algorithms based on actual demand. MRP became the foundation for ERP systems, integrating planning across functions. His principles were later expanded with the addition of Demand-Driven MRP (DDMRP) by Chad Smith & Carol Ptak.
19. **Speaking of Carol Ptak & Chad Smith:** These two are the creators of Demand Driven MRP (DDMRP), an important advancement in MRP (also known in academic circles as dynamic lead time offset scheduling). This advancement has led to substantial thinking around managing work-in-process queues, component safety stocks, and throughput management.
20. **George Plossl:** Co-developed and popularized MRP systems alongside Joseph Orlicky. He strongly advocated for top management involvement in inventory control and production planning. His still relevant *"Seven Supply Chain Points"* emphasized real customer needs, fast information flow, and constant lead time management. His work helped bridge technology and managerial discipline in planning systems – all still immensely useful at all levels.
21. **Yossi Sheffi** (MIT): Expert in resilience and risk management, especially post-9/11 and during COVID-19 – still useful.

22. **Shigeo Shingo:** Co-architect of the Toyota Production System (TPS) alongside Taiichi Ohno. He invented Single-Minute Exchange of Die (SMED) to drastically reduce setup times and improve flexibility. He also introduced Poka-Yoke (error-proofing) and source inspection, eliminating defects at the source. His teachings laid the groundwork for Lean Manufacturing and continuous improvement culture – all *"trajectory-shifting"* useful in every company in the world.
23. **David Simchi-Levi** (MIT): Developed advanced models for demand forecasting, inventory optimization, supply chain optimization, and risk analysis – all immensely useful in all S&OP environments.
24. **Frederick Taylor:** Father of *"Scientific Management."* His work on labor efficiency and workflow optimization laid the groundwork for modern operations and logistics – and still useful every day!
25. **Oliver *"Ollie"* Wight:** Prolific author and founder of Oliver Wight Associates. Ollie was a pioneer in business planning processes and a key figure in the evolution of MRP into MRP II, and production planning into Sales and Operations Planning (S&OP). His work inspired tens of thousands of executives and contributed to significant improvements in productivity, inventory turnover, customer service, and enterprise growth.

In addition to these modern-age scholarly contributors, there were SEVEN pre-1750's sources who laid the foundational logic that these twenty-five built from, including:

1. **Xenophon (430–354 BC):** In *Oeconomicus*, he discussed household management and division of labor. His early articulation of specialization and resource allocation are precursors to efficiency principles in supply chains.
2. **Plato (427–347 BC):** In his "*The Republic*," he emphasized specialization of labor in society. His philosophical foundation for the idea that productivity increases when individuals focus on specific tasks was inspiration for Adam Smith, Frederick Taylor, and Henry Ford.
3. **Roman Military & Engineering Thinkers (1st–4th century):** Roman legions perfected logistics systems - standardized roads, supply depots, and ration distribution. Their military supply chains were arguably the first large-scale, organized logistics networks. All subsequent logistics studies were built on the Roman Military's logistics experiments.
4. **Ibn Khaldun (1332–1406):** In *Muqaddimah*, he analyzed economic cycles, trade, and the role of labor in prosperity. The modern labor union movement and labor-based economics owe their origins to this scholar. His systemic view of trade and production foreshadowed later supply chain theories.
5. **Leonardo da Vinci (1452–1519):** He designed machines and studied workflow efficiency. Though more of an inventor, his sketches of automated production and mechanical material handling anticipated, and greatly inspired, modern industrial automation.
6. **Mercantilist Economists (16th–17th centuries)** Various writers like Thomas Mun (1571–1641) and Jean-Baptiste Colbert (1619–1683) emphasized trade balance, resource flows, and state-controlled supply systems. Their focus on managing imports, exports, and colonial supply routes shaped early global logistics; and continue to inform global trade policy makers to this day.

7. **Joseph Moxon (1627–1691):** Published *Mechanick Exercises*, detailing standardized manufacturing processes. His early documentation of process standardization became the precursor to today's industrial operations manuals.

Together, these pre-1750 thinkers created the conceptual and practical scaffolding that Adam Smith later synthesized into a coherent economic theory… and great supply chain thinkers crafted into modern global supply chain management principles.

Everything these 25+7 great thinkers developed are *"cornerstone useful"* every day, in every global supply chain. I am confident that full comprehension of everything these thinkers present is more useful than ANY college degree, from ANY supply chain program, in ANY university… because embedded in these thinkers' writings, are all the inescapable questions users of AI tools need to effectively administer quality assurance on AI generated recommendations. Evaluating complex supply chain problems and recommended solutions demands a solid internalization of logical supply chain principles… which is exactly what these 25+7 provide.

As a final note, Amazon can provide books and study materials from each of these scholars. Give their AI-driven literature search tools a try… and read, read, read!

About Alan G. Dunn

Alan G. Dunn is currently President of GDI Consulting & Training Company and founder of the Manufacturing Executive Institute (MEI). He is also the creator and lead-instructor of the 18-month **Next Generation Global Supply Chain Leadership Development Program** at the California Institute of Technology's (Caltech) Center for Technology & Management Education (CTME), where he has taught since 1984. Mr. Dunn also serves on the University of California at Riverside's (UCR) Advisory Board for Transformative Leadership in Disruptive Times.

Previously, Mr. Dunn was a Vice President at Gemini Management Consulting (now Capgemini) and a Partner at Coopers & Lybrand (now PwC). In both positions, he led large technical manufacturing teams through innovative productivity enhancement projects. Mr. Dunn has participated in >188 significant manufacturing and distribution projects inside >118 companies. He has worked in 24 countries and across most manufacturing sectors. Mr. Dunn has delivered >800 discrete training sessions throughout his career.

Mr. Dunn specializes in supply chain management, strategic planning, manufacturing management, operations management, leadership development, cost management, and business finance. He is curious and passionate about everything in the manufacturing and distribution industries. This curiosity and passion have led him to lead 6 significant supply chain research projects, author >70 published articles, create >15 significant consulting methodologies and develop >100 training courses for professionals in the manufacturing & distribution industries. It is Alan's depth and breadth in the global supply chain body-of-knowledge that provides him with an ability to assemble and lead highly capable teams to solve problems thought to be unsolvable.

Over his 40-year career in global supply chain consulting, Mr. Dunn has served on the Boards of Directors of numerous public, private and non-profit companies. He is the recipient of the National Association of Corporate Directors (NACD) prestigious *"Director of the Year"* award in 2007.

Alan is a career-long volunteer for the Association of Supply Chain Management (ASCM), having served as the President of the Orange County Chapter in 1984 and Chairman of ASCM in 2015. He was inducted into the *"ASCM New England Supply Chain Conference Hall of Fame"* in 2022. Mr. Dunn has spoken to nearly all the APICS/ASCM chapters and at the ASCM international Conference >20 times.

Mr. Dunn has a degree in business management from California State University, Fullerton, where he occasionally lectures in the business school.

About GDI Consulting & Training Company

GDI Consulting & Training (GDI) provides practical solutions to complex business and managerial problems in manufacturing and related industries. Our firm has successfully assisted clients around the world for more than 40 years, having performed more than 188 projects in over 118 companies in 24 countries. GDI applies specialized and common-sense solutions... *not overly intellectualized approaches...* to numerous types of challenging client problems in manufacturing and distribution industries, including:

Complex Problem Solving	Core Business Process Re-Engineering
Factory & Distribution Facilities Layout & Design	Enterprise Performance Metrics & Compensation Systems
Cost Management Systems	Organization Design & Improvement
Operational Due Diligence	Business Strategy Formulation
Quality Management Systems Design & Implementations	IT Data Integrity & Reliability Improvements
Factory & Distribution IT Systems Design & Implementation	Process Flow Design & Implementation

ONE Company – SIX Solutions

We can bring numerous professional services to our manufacturing and distribution clients… all focused on improving the trajectory of people & enterprise performance.