Digital Skills Transformation—Often Forgotten Critical Element of Digital Transformation

PLM Road Map™ EMEA & PDT Europe 2022

18 October 2022

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PLM Road Map™ EMEA & PDT Europe 2022
Digital Transformation and PLM – a call for PLM professionals to re-define and re-position the benefits and value of PLM

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Peter A. Bilello, President & CEO

Professional background

- More than 30 years of experience in the development of IT solutions for research, engineering, and manufacturing organizations worldwide

- Led numerous projects in PLM analysis, selection, implementation & management, synchronous and lean manufacturing consulting & software engineering, as well as general data management & governance strategy development and support

- Authored many papers & research reports on PLM and related topics, as well as numerous articles, commentaries, and perspectives that have appeared in publications throughout the NA, EMEA & Asia

- Holds a B.S. in Computer Science (minor in Physics) & M.S.E. in Manufacturing Systems Engineering
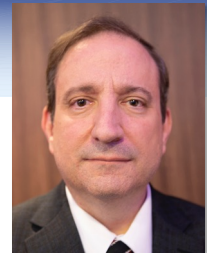
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CIMdata's Mission...

Strategic management consulting for competitive advantage in global markets

CIMdata is the leading independent global strategic management consulting and research authority focused exclusively on PLM and the digital transformation it enables.

We are dedicated to maximizing our clients' ability to design, deliver, and support innovative products and services through the application of PLM.

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CIMdata's Services...

Creating, disseminating, and applying our intellectual capital in support of your digital transformation

Research
- Market research & analysis
- Technology research & analysis
- Reports & publications across multiple domains
- Market news
- Member services...

Education
- Certificate Programs
- Executive seminars
- Technology seminars
- Educational webinars
- Int'l conferences & workshops
- Best practices training...

Consulting
- Strategy & vision
- Needs assessment
- Solution evaluation
- Best practices
- Quality assurance
- Program management
- Market planning...

Delivering strategic advice and counsel through a comprehensive, integrated set of research, education, and consulting services

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Key Takeaways

Digital Skills Transformation—Often Forgotten Critical Element of Digital Transformation

- One of the most common reasons for digital transformation failure is assuming that people will do what they're told to do, in the way they should
- An effective organizational change management (OCM) program is one of the elements needed to help people understand why they need to change
- Strategies, plans, and support for people to execute the change is required
- New ways of thinking, alongside the development of new digital skills must be addressed—an often-overlooked aspect of transformation
- Ensuring that the workforce acquires and uses appropriate new skills is best accomplished by defining & implementing an appropriate framework
- Ultimately, you must incorporate digital skills transformation alongside OCM and training execution—solution training isn't enough

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Topics

Digital Skills Transformation—Often Forgotten Critical Element of Digital Transformation

- A Few Introductory Observations
- Fundamentally, the organization is a Reflection of Its People
- CIMdata's Critical Dozen Transformational Elements
- A Framework for Digital Skills Transformation
- Concluding Remarks

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Introductory Observations
Some specific industrial observations (1 of 2)

- As industrial organizations dig themselves out of the rubble of the latest disruption, long-accepted views of product development & other lifecycle phases are increasingly recognized as inadequately defined & supported
- Complexities, risks, and opportunities that have been downplayed or ignored are now being tackled on the factory floor, in the field, in the executive suite, and everywhere in between
- A massive upheaval is sweeping through many organizations—one that impacts how the organization operates, prospers, and views itself, its competencies as well as its products & services

There is increasing urgency, leadership teams and corporate management are demanding speed-ups in transformations to be ready for the next disruption.

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Introductory Observations
Some specific industrial observations (2 of 2)

- Part of this upheaval is the rapid acceleration of the extraction of information that is trapped in paper documents or tangled in data formats that often mimic paper
  - Data access and quality issues burden almost all product development, production, and support teams
    - Liberating this data requires transforming an unfathomable amount, and variety, of data into the model-based enterprise (MBE) and its many model-based structures—this is a journey
- Disruptions of supply chains, component shortages, workforce skill mismatches, and the after-effects of the ever-evolving COVID-19 pandemic are turning digital transformation's long journey into a race

Slow-moving organizations aren't likely to prosper or perhaps even survive; they will be blindsided by changes that are multiplying in every marketplace.

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Digital Skills Transformation
PLM Road Map™ EMEA 2022—18 October 2022

To Be Successful
The need to focus on the appropriate people, processes, and technological transformational elements

- Today's complex and continually changing marketplace requirements demand up-front, cross-domain connectivity
  - With the appropriate and easily accessible model-based data constructs
  - System & data interoperability is of paramount importance
  - Organizations run on data—all products & services are just a result of data
- This complexity can only be tackled with cross-functional activities and investigations to root out the unknowns and then nail down wise solutions that are optimized from a complete systems of systems perspective

CIMdata's "critical dozen" has been born out of the recognition that transformations have been too difficult primarily because so many don't concentrate their productive efforts on the right transformational elements.
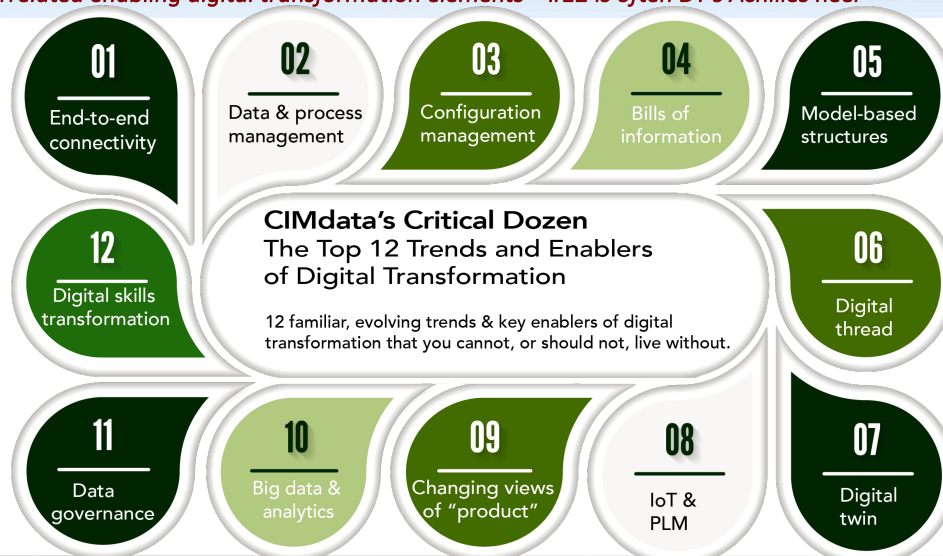
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CIMdata's Critical Dozen
12 key interrelated enabling digital transformation elements—#12 is often DT's Achilles heel

01 End-to-end connectivity

02 Data & process management

03 Configuration management

04 Bills of information

05 Model-based structures

12 Digital skills transformation

CIMdata's Critical Dozen
The Top 12 Trends and Enablers of Digital Transformation

12 familiar, evolving trends & key enablers of digital transformation that you cannot, or should not, live without.

06 Digital thread

11 Data governance

10 Big data & analytics

09 Changing views of "product"

08 IoT & PLM

07 Digital twin

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People Are At the Core
Fundamentally, the organization is a reflection of its people!

The Art of Achieving Quality

At its root, the corporation can only be an expression of its people. It cannot really be a thing that knows itself unless the parts of it, its people, know the thing, the corporation.

Dr. G. Fredric Bolling
Gower Publishing Company, Brookfield, VT, USA 1994.

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3 Key Factors to Maximize Return on Investment
People, technologies, and processes interrelate

- You cannot maximize benefits by improving one of these 3 in isolation
- Applying new technologies in out-of-date ways just allows people to create errors & take bad decisions more quickly
- People are adept at using tools & processes incorrectly— they have to be trained in the tools & the processes
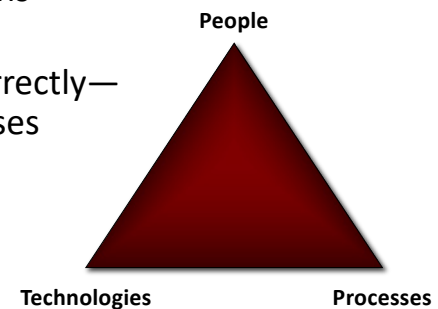
People

Technologies   Processes

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Key Learnings & Guidelines

The 9 key learnings and guidelines for digital transformation enablement

1. Digital transformation must be ongoing and central
2. Digital transformation can't harm the employees
3. There is no choice—you must transform (i.e., transform or die)
4. A digital culture must be cultivated
5. Innovation must be fostered
6. New skills must be developed
7. Digital leaders need to improve
8. You must unlock the people premium
9. Following a best practice approach

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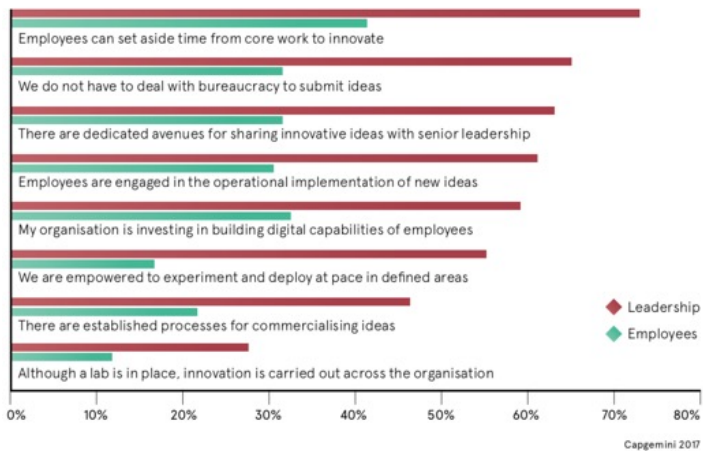Copyright © 2022 by CIMdata, Inc.

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Learning #2: Can't Harm the Employees

"By putting the [people work] at the front end of a project, rather than an afterthought, you will harness support from the very people who can make or break any project."

Innovation initiatives are not being realised
Percentage of leaders and employees who agree with the following statements on innovation initiatives

Employees can set aside time from core work to innovate

We do not have to deal with bureaucracy to submit ideas

There are dedicated avenues for sharing innovative ideas with senior leadership

Employees are engaged in the operational implementation of new ideas

My organisation is investing in building digital capabilities of employees

We are empowered to experiment and deploy at pace in defined areas

There are established processes for commercialising ideas

Although a lab is in place, innovation is carried out across the organisation

0% 10% 20% 30% 40% 50% 60% 70% 80%

◆ Leadership
◆ Employees

Capgemini 2017

Digital Transformation, Raconteur, *London Times*, 26 September 2018.

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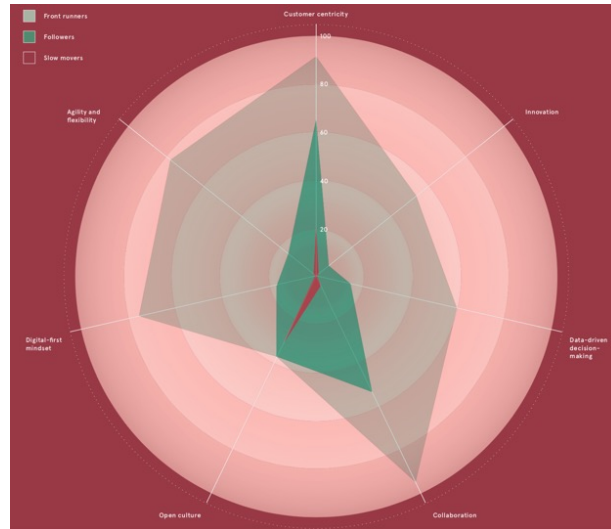## Learning #4: A Digital Culture Must Be Cultivated

"Digital technologies have the potential to revolutionize entire businesses, but without the right strategy, approach and leadership, transformation initiatives will fail."

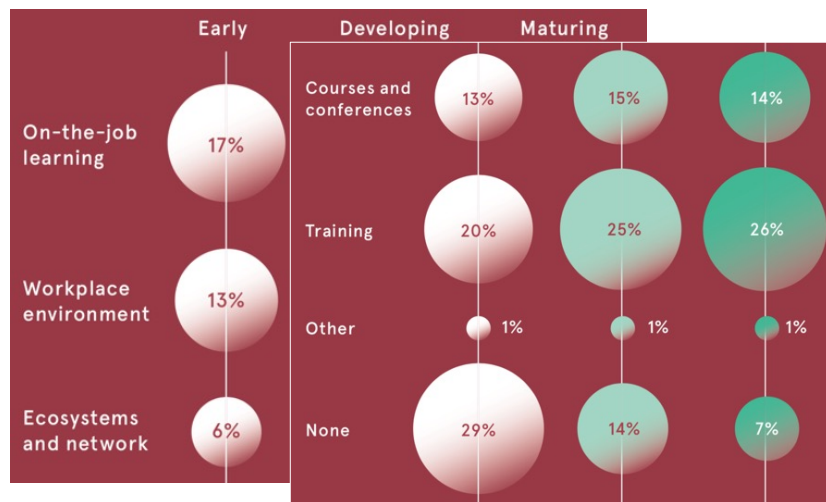Digital Transformation, Raconteur, *London Times*, 26 September 2018.

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Learning #6: New Skills Must Be Developed

Developing new skills for a digital environment

How companies at different stages of digital transformation develop new skills*

*Maturity of digital capabilities/processes were ranked on a scale of one to ten: early (one to three), developing (four to six) and maturing (seven to ten) Deloitte/*MIT Sloan Management Review 2018*

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Learning #8: You Must Unlock the People Premium

01 Even the best quality data is worthless, unless it unlocks great insight.

02 Digital drives efficiency, but don't make your brand experience less human.

03 Do the right thing with customer data – misusing it is the biggest strategic risk facing CMOs.

04 A brand's "shop window" has never been more complex or fragmented, but it has to appear seamless.

05 Digital is a two-way street – listen, learn and be ready to change, always putting people first.

Digital Transformation, Raconteur, *London Times*, 26 September 2018.

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Success Includes People, Processes & Technologies
I am glad that we aren't the only people saying this

The most successful transformations enable employees from every corner of the organization to put forward ideas that can improve the focus, process, and execution of initiatives.

London, Laura, Madner, Stephanie, and Skerritt, Dominic, *How many people are really needed in a transformation?*, McKinsey & Company, September 2021.

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People ARE the Key to Success
Success depends on the organization's workforce & its willingness to utilize newly enabled capabilities & tools

- While all twelve digital transformation elements are critical, a digital transformation will always fail to reach its true potential without the appropriate workforce alignment
- Acceptance of digital transformation's trends and enablers is essential to the innovation and close collaboration needed to deliver competitive, profitable products and services into today's marketplaces
  - These trends and enablers require the mastering of new tools and technologies that can deliver huge benefits to the entire enterprise and its workforce and managers

Those that fail to put people first will fail to be first.

#12: Digital Skills Transformation
Assessing, Defining & Enabling the Workforce of the Future—you can't transform the business without it

- A well-defined Digital Skills Transformation program is multi-faceted, and should include organizational, process, technology, content & delivery considerations
- An education & training framework, and related implementation & support structures cover different organizational processes & supporting platforms
- Different experience and skill levels need to be incorporated into one repeatable standard, applicable throughout an enterprise, no matter its size or complexity
- With the appropriate structure in place, an enterprise is in a better position to proactively handle growth, reduce employee turnover, and successfully deal with the technological and process changes encountered

Major Driving Factors of Digital Transformation
Let's step back for a second and review what's driving transformation

- A few major driving factors of the industrial economy include:
  - Growing electronics content and software in physical products
  - New manufacturing techniques and support processes
  - Introduction of new lighter, stronger, and "greener" materials
  - Mass customization of all the latest tech features in each new offering
  - Nonstop innovation leading to shorter product lifecycles
  - The Internet of Things (IoT), with its continuous marketplace feedback

- Failure to implement the appropriate tools and technologies puts everyone in the enterprise at the mercy of the digital transformation driving factors that are throughout the industrial economy

Those that fail to evolve will be left behind.

New & Evolving Tools & Technologies
A sample of the new and evolving tools and technologies that benefit the enterprise

- Generative design
- Additive manufacturing
- Artificial intelligence
- Machine learning
- Virtual reality/augmented reality
- Topology data analytics
- Predictive analytics
- Agile product development
- …

So, how to maximize the value of pursuing a true transformation.

What True Transformation Requires
Main elements of a comprehensive transformation program—extensive training & education

- Organization Change Management (OCM) related education (Why Change)
- Training on new processes & systems (How to Work in New Ways)
- Skills transformation (How to Work Better/Differently)

All three are critical elements, but most don't address skills transformation.

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Digital Skills Transformation's Framework
Basics regarding how to go about a digital skills transformation

- **Note:** workforce transition cannot be handled with typical in-house training
  - Nor can this vital transition be fully handed off to the solution providers
- To be sure of success, the starting point for digital skills transition is clarifying how to use, work within and execute each business unit's new process-enabling systems, solutions, and tasks
  - These initial details should be folded into a detailed learning framework covering the new skills that need to be absorbed
  - The framework should also consider implementing new processes as there will be big changes in the way products are developed, engineered, produced, serviced & more

If implemented well, this learning framework will be invaluable in securing resources from elsewhere in the enterprise.

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Help Exists
There is no reason to go it alone

- Many systems integrators and software providers in the PLM space offer solution-specific training
  - Some also deliver process-related educational services
- Additionally, some boutique firms focus on more expansive training and even comprehensive skills enhancement, guidance, and support
  - For example, CIMdata offers an extensive PLM Certificate Program with live and virtual eLearning courses, as well as an extensive Digital Skills Transformation consulting practice

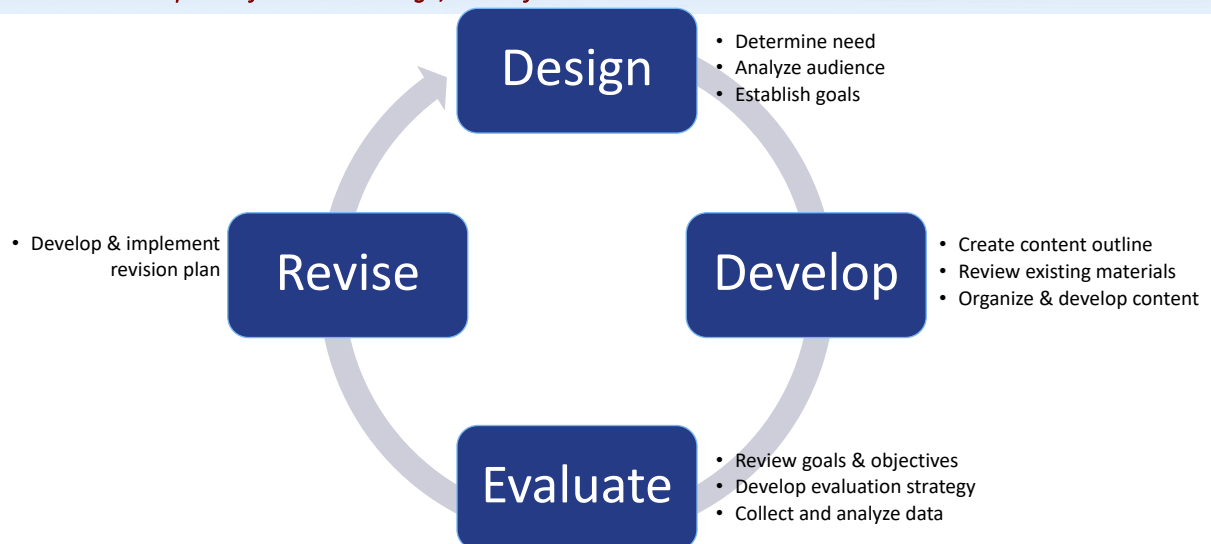*Skills transformation is not a typical enterprise capability. Seek support.*

The Basic Framework: Four Main Activities
Framework development focuses on Design, and defines the other 3 activities

Design
- Determine need
- Analyze audience
- Establish goals

Develop
- Create content outline
- Review existing materials
- Organize & develop content

Evaluate
- Review goals & objectives
- Develop evaluation strategy
- Collect and analyze data

Revise
- Develop & implement revision plan

Guiding Principles of the Framework
For your consideration (1 of 2)

- **The program should be strategy-driven**
  - The program must be in line with the organization's overall strategic goals
- **Criteria that define success should be defined & consistently refined**
  - It should result in a return on investment, usually in the short- as well as the long-term
- **The program should be supported by key strategies, systems, structures, policies & practices**
  - It should ensure that learning is aligned with & directly supported by organizational structures, lines of authority, decision-making, values & other business practices
- **The program should be driven through many channels**
  - Different platforms should be explored & utilized to reinforce outcomes & ensure that people get the right skills at the right time, in the right way & at the right cost
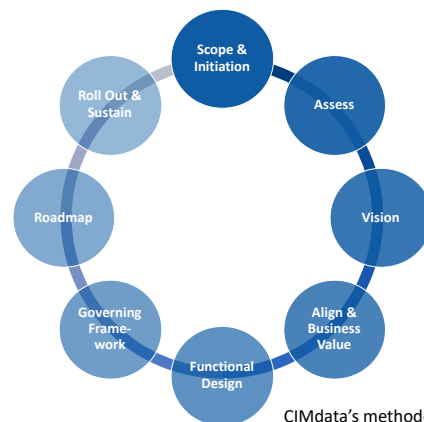
Guiding Principles of the Framework
For your consideration (2 of 2)

- **Learning by doing & establishing shared accountability should be practiced**
  - By identifying their own needs, creating individual learning plans & seeking learning opportunities, employees are encouraged to take responsibility for learning and applying the learned concepts at work

CIMdata's methodology

Adapted from https://trainingindustry.com/articles/content-development/training-best-practices-and-organizational-success/

Digital Skills Transformation Design
The main steps in the design of a digital skills transformation framework

- The activity starts with scope definition and finishes with delivery of a Skills Transformation Framework and associated roadmap
- Detailed steps to be executed include:
    - Define user communities impacted
    - Define topics/skills to be covered based on User Stories in scope
    - Define needs & desired outcomes
    - Create an implementation/transition roadmap
    - Identify current & potential content development resources
    - Identify necessary facilities
    - Identify trainers and other personnel necessary to support the program

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Framework Fundamentals
Some key digital skills transformation framework fundamentals

- The framework should cover the level of detail needed for your specific digital skills transition
    - i.e., it needs to be aligned with your digital transformation initiative
- Sustainability must be part of all these frameworks, hence the need to evaluate and revise sections
    - Templates and lesson plans should be frequently reverified and placed under change control
    - Refresher courses will be needed to deal with shortcomings, new concerns, and changing priorities

Even the best framework becomes a liability if it can't keep pace, wasting all the time and resources invested in skillset upgrading.

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Frameworks Generate Sizeable Benefits
Results of getting it right can be significant

- Increased adherence to new (and existing) processes
- Greater productivity with tools new and old
- Enhancement of existing skills
- Building new skills (a.k.a., reskilling)
- Higher employee retention rates
- Defined pathways for job enhancement and progression

The transformation journey is well worth the effort.

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Concluding Remarks
Digital Skills Transformation—Often Forgotten Critical Element of Digital Transformation (1 of 2)

- Some may think that frameworks with this level of detail might seem like academic overkill, but we need to remember that…
  - Every employee has a combination of skills, needs, and shortcomings that are unique to their job, business unit, and department
  - Keeping track of all this information is why frameworks, templates, and lesson plans are so valuable
- The skills of the organization's workforce & its willingness to utilize and take advantage of newly enabled capabilities will determine the ultimate success of digital transformation
- Ensuring that the workforce acquires and uses these new skills is best accomplished by defining and implementing an appropriate framework

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Concluding Remarks
Digital Skills Transformation—Often Forgotten Critical Element of Digital Transformation (2 of 2)

- Digital transformations often fail because it is assumed that people will do what they're told to do, in the way they should

- An effective organizational change management (OCM) program is also needed to help people understand why they need to change

- Strategies, plans & support for people to execute the change are also required

- New ways of thinking, alongside the development of new digital skills must be addressed

- Ultimately, you must incorporate digital skills transformation alongside OCM and training execution into a comprehensive transformation program

You can't afford to forget to transform your digital skills.

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