*PM World **Journal*** *(ISSN:2330-4480)*
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

The Connected Future Business Culture:
The Great Project Management Accelerator

The Digitally Enabled Estimating Enhancements[1]

By Dr. Harold Kerzner
and
Dr. Al Zeitoun

Introduction

Every year, more people graduate from college and enter the field of project management. Most of these people learn modern project management practices in the classroom but may be unfamiliar with the developments in project management and the problems that modern estimating and project management practices are trying to resolve. To understand the changes that have been taking place, and the reasons why certain topics are frequently discussed in periodicals, one must understand the issues we faced initially and how we tried to resolve them, in many cases unsuccessfully until now. For the remainder of this paper, we will reflect on the topic of estimating and associated data sources and systems.

This is one of the topics that directly contribute to the success of organizational planning efforts. The changes that have been taking place in business and in the way of working of programs/projects have led to an unprecedented level of uncertainty that make the topic of estimating and the associated risks central to the success of the strategic initiatives.

In this article, we also discuss several aspects of the information warehousing growth that drive companies towards the consistent application of Business Intelligence (BI) Systems. It is in our view that digitally enabled estimating requires innovation in order to create a commercially successful product, which also means that the team members must understand the knowledge needed in the commercialization life cycle starting from the early projects' stages.

---

[1] How to cite this paper: Kerzner, H. and Zeitoun, A. (2022). The Digitally Enabled Estimating Enhancements: The Great Project Management Accelerator series, *PM World Journal,* Vol. XI, Issue VII, July.

THE ESTIMATING CHALLENGES_____

During the past 20 years, there has been a significant growth in research surrounding effective project management and estimating techniques. Most of the research focused on functional related estimating and how to build on the expertise and knowledge base of organizations. The tendency across organizations is to standardize and try to achieve a methodology or a framework that all could follow across organizational verticals. The use of the one-size-fits-all methodology became common practice for many companies for perhaps more than two decades. What many people failed to realize, either intentionally or unintentionally, was the type of projects that were "forced" to use the methodology. Projects with well-defined requirements and well-written business case, whether prepared by the client or the contractor, could be successfully estimated, planned, and executed using the one-size-fits-all approach. These were considered as traditional projects. But what about the growing percentage of nontraditional types of projects that may not be well-defined, such as innovation, digital transformation, R&D, and business strategy initiatives? These projects may be initiated based just upon an idea.

There were several issues that began to surface regarding these nontraditional projects:

- The nontraditional project had a much greater impact on long-term competitiveness and profitability than did the traditional projects but data did not exist to support effective estimating
- Many of the decisions made by the functional managers on the nontraditional projects focused heavily upon short-term profits that could impact the functional manager's year-end bonus
- Personal agendas and functional unit objectives were becoming more important than the long-term best interests of the organization
- In some studies, as much as 80 % of the nontraditional projects did not deliver part or all of the business benefits and value expected
- Articles appeared identifying the benefits of using project management and estimating practices, but the majority of the articles focused on traditional rather than nontraditional projects
- Executives were unable to make informed decisions in a timely manner due to a lack of reliable metrics to support time and cost estimates accuracy

OVERCOMING ESTIMATING CHALLENGES_____

Overcoming these challenges has not been easy, but significant progress has been made. Articles in journals such as the PMWJ, PMI publications and new textbooks

discussing the changes that are taking place have shown the worldwide project management community of practice that effective managing of change can take place. Most of the challenges we faced over the past several decades are now being eliminated as a result of:

- The growth in the use of flexible methodologies such as Agile and Scrum, either independently or in combination with the firm's existing methodologies has resulted in a much higher success rate for both traditional and nontraditional projects
- Advancements in estimating and measurement techniques have allowed project teams to plan, measure and report project progress much more accurately than with just time and cost metrics. Many of the new metrics measure business, strategic and intangible factors allowing executives to make better decisions based upon evidence and facts rather than just guesses
- We now have new definitions of project success, supported by some of the new metrics, which includes business benefits and business value created rather than just deliverables produced
- Project management cultures are being created based upon trust, which supports the critical dialogues needed for enhanced estimating
- New forms of project management leadership are appearing that maximize worker engagement efforts and make them feel comfortable to speak their mind without retaliation and then contribute freely to the success of the projects' planning efforts
- Capturing project management best practices and using them for continuous improvement efforts has become a way of life in most companies
- The knowledge contained in information warehouses, as well as the amount of information and speed of access, provides companies with a source of competitive advantage

THE NEED FOR KNOWLEDGE REPOSITORIES _____

The use of a knowledge management system is expected to become a necessity for all future project teams. Project teams should first map out the mission-critical knowledge assets that are needed to support the project's strategic planning. It is critical to determine which knowledge assets to use and exploit. By mapping the knowledge assets, you put boundaries around what the project is designed to do. Unfortunately, the only true value of a knowledge management system is the impact on the business. Simply stated, we

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

must show that the investment in a knowledge management system contributes to a future competitive advantage.

Knowledge management can increase estimating quality, competitiveness, allow for faster decisions and responses to disruptive changes, and rapid adaptation to changes in the environment. Knowledge management access is critical during design thinking. The growth in information has also created a need for cloud computing. Companies are now creating knowledge management systems and knowledge repositories, as shown in Figure 1.
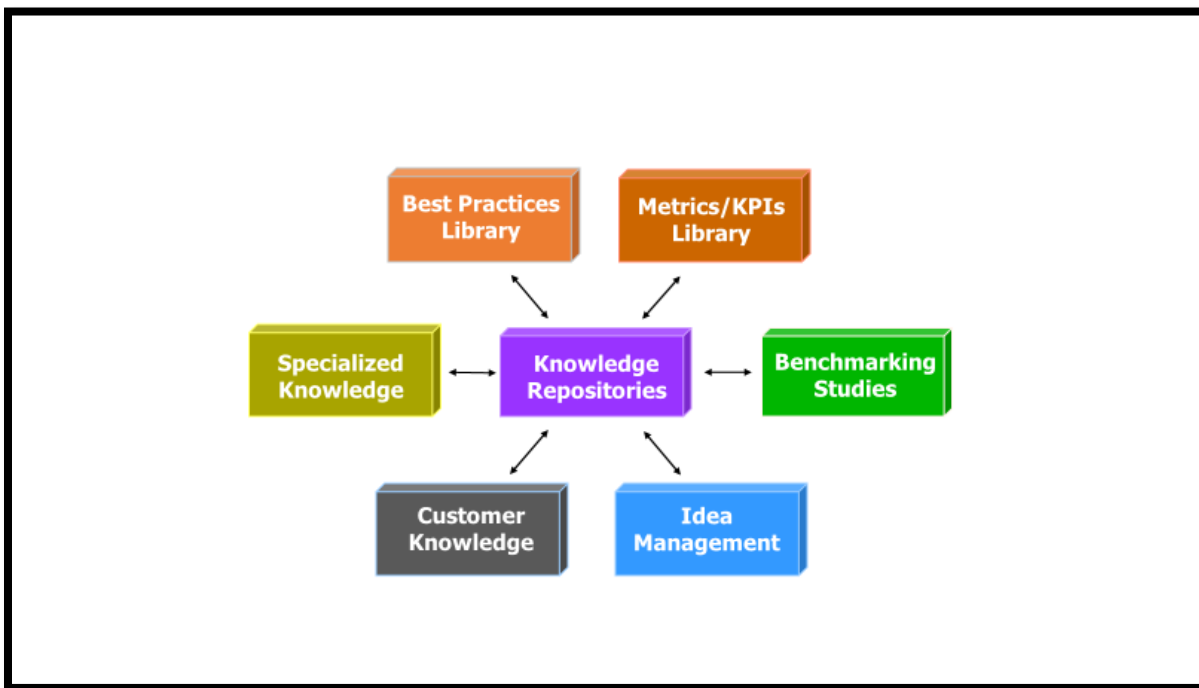

Figure 1. Components of a Knowledge Repository

Companies invest millions of dollars in developing information warehouses and knowledge management systems. There is a tremendous amount of rich but often complicated data about customers, their likes, and dislikes, and buying habits. This knowledge is treated as both tangible and intangible assets. But the hard part is trying to convert the information into useful knowledge to contribute to excellence in estimating and planning at large.

INTANGIBLE INTELLECTUAL CAPITAL ASSETS _____

The information contained in a knowledge repository is often referred to as intellectual capital. As shown in Figure 2, intellectual capital is frequently considered as intangible assets categorized as human, product and structural capital. These are knowledge-related assets normally not identified on the balance sheets of companies, but they can be transformed into value that leads to a sustainable competitive advantage.

Knowledge data bases and information warehouses are needed to support intellectual capital components. These intangible assets that are used to define intellectual capital could be strategically more important to the growth and survival of the firm than its tangible assets. Project teams are becoming more knowledgeable in the importance of intangible assets and are consistently using that in enhancing their estimating and planning capabilities.
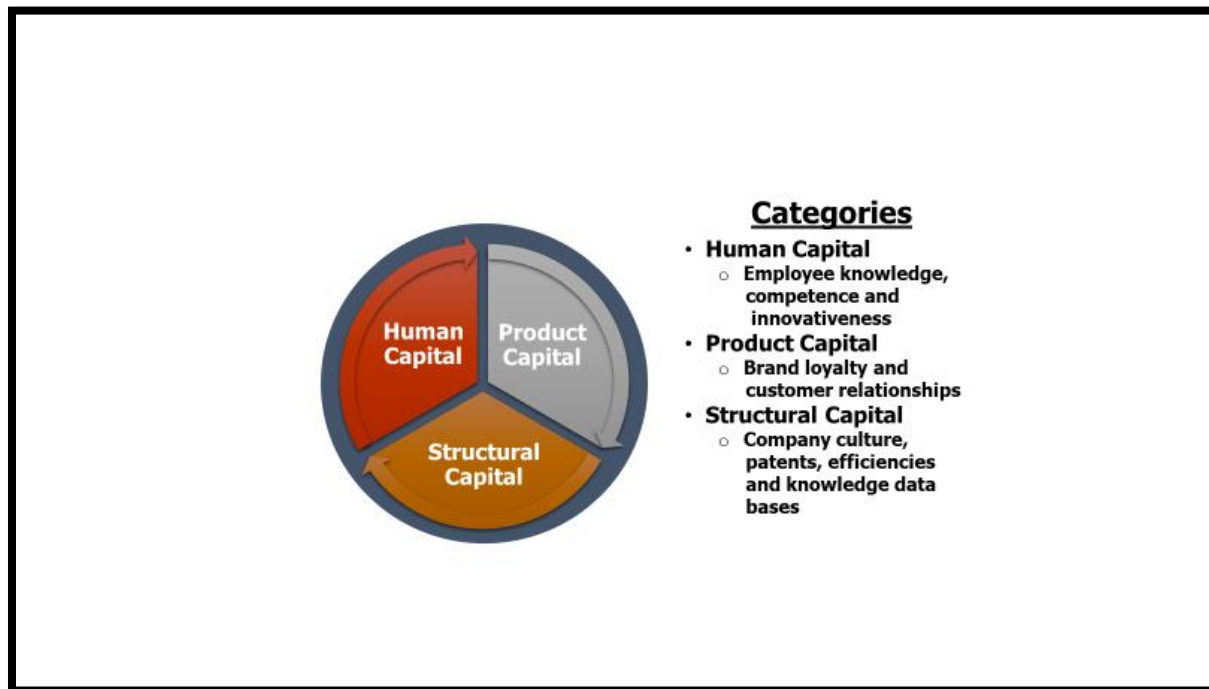

Figure 2. Three Critical Intangible Components of Intellectual Capital

CATEGORIES OF KNOWLEDGE _____

In Figure 1, we showed the components of a knowledge repository. The knowledge in each component can come from multiple knowledge sources. There are several sources of knowledge and they are not mutually exclusive. Table 1 lists some ways to classify knowledge sources:

Source of Knowledge	Description
Explicit	Encoded knowledge that can be found in books, magazines, and other documents
Implicit (or Tacit)	Knowledge in the heads of people. Also, knowledge retained by suppliers and vendors. Knowledge may be difficult to explain.
Situational	Knowledge related to a specific situation, such as a specific use of a product.
Dispersed	Knowledge that is not controlled by a single person.
Experience	Knowledge obtained from experiences or observations of clients using the product; must understand user behavior.
Procedural	Detailed knowledge on how to do something

Table 1. Sources of Knowledge

As the future of work, we continue to highlight in this series, is highly team-centered, project teams must understand their role in driving the use of knowledge assets. Teams should enable their projects to be innovation centers, where continued experimentation takes place and drives future effective estimates that support better digitally empowered planning and decisions.

THE NEED FOR BUSINESS INTELLIGENCE SYSTEMS _____

Simply having knowledge repositories or information warehouses may not be sufficient to support future projects' estimates in an effective manner. BI systems are often considered as the next step after knowledge repositories or information warehouses and combine business information with technologies in a manner that allows project managers to make strategic and/or operational business decisions related to their projects.

www.pmworldlibrary.net
Page **6** of **13**

The components of a BI system are data gathering, data storage, and knowledge management. Metrics information is a critical component of BI systems. The information contained in the BI systems can be historical, current, and predictive. The information can come from several sources including strategic and operational project management benchmarking studies conducted by PMOs.

BI technologies are designed to handle large amounts of "big data", whether structured, semi-structured, or unstructured, and present the data on meaningful dashboards such that project teams can make better business decisions and take advantage of business opportunities, especially when managing strategic projects. The technologies used in BI systems allow companies to look at external data (i.e., information from the markets in which the company operates) and internal data (i.e., financial and operational data) together and create business intelligence information to support strategic, tactical, and operational projects. BI systems facilitate corporate estimating and decision support systems by transforming raw data into meaningful and competitive business intelligence. However, there are still companies that believe that BI systems are merely the growth of business reporting systems.

Project managers will need to learn new estimating and decision-making tools including digitalized economics, artificial intelligence, and the Internet of things (IOT). With large amounts of data, teams may have to rely upon analytical statistics which includes:

- Descriptive data analytics: analysis of historical data including past successes and failures
- Predictive data analytics: analysis of the data to make predictions of what might happen
- Prescriptive data analytics: look at the reasons why things may happen, estimate options for risk mitigation of future work, and options to take advantage of opportunities

BIG DATA _____

The growth of big data will most likely impact most companies worldwide. For effective analysis of the data, project teams will need workers that possess data science capability. The skills will include statistical methods, computational intelligence, and optimization techniques.

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

There are numerous mathematical models that currently exist to support project estimating and decision-making efforts using big data. A list includes:

- Financial models (ROI, IRR, NPV, payback period, benefit-to-cost ratio, breakeven analysis)
- Time (scheduling models)
- Money (cash flow models)
- Resources (competency models)
- Materials (procurement models)
- Work hours (estimating models)
- Environmental changes models
- Consumer tastes and demand models
- Inflation effects models
- Unemployment effects models
- Changes in technology models
- Simulation and games models
- Mental models

The expected benefits from using big data effectively include:

- Detection of patterns and trends related to time, cost, and scope
- Comparison to other projects as well
- Identification of the root causes of problems
- Better use of "what if" scenarios
- Better tradeoffs on competing constraints
- Better tracking of assumptions and constraints
- Better tracking of VUCA and the enterprise environmental factors
- Better response to out-of-tolerance situations
- Better capacity planning decisions involving resource utilization
- Ability to make strategic rather than just operational decisions
- Ability to make change management decisions
- Decision-making can be pushed down the organizational hierarchy, but there will be "rules for decision-making" established
- Emphasis on long-term perspectives rather than just short-term
- A reduction in the risk of making the wrong estimates or decisions because of a lack of information

Project teams seem to focus on the knowledge management portion of the BI system. This includes:

- How performance metrics are created and reported

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

- How benchmarking information can be extracted
- Statistical and predictive analytics
- Data visualization techniques and dashboard design
- Business and project reporting for executives and stakeholders

THE PATH FORWARD _____

Reflecting back on our recent work on the experience culture skills, the project teams of the future will be equipped with new skills such as being data scientists, knowledge assets analysts, and strategically minded leaders. Sensing and responding strengthening are highly data-centered and strengthening these muscles, focusing on business value, and building higher adaptability to changing customer requirements will enhance estimates and decisions quality by the future leaders.

One-size-fits-all estimating or planning models will not exist in the future. The ingredients and building blocks around data warehousing, knowledge assets, and business intelligence will dominate the next decade of estimating capabilities. Leading with data and knowledge-centered objectivity will be a major priority for executives and future leaders.

The path forward requires a strong commitment to the necessary information, tools, and processes to support complex problem analysis and decision making. Advances in technologies and the growth of information warehouses are driving companies toward consisted application of business intelligence (BI) systems.

We believe the future will see continuation of managing our business by projects and that project management is the delivery system for sustainable business value. Therefore, project managers are expected to deliver better estimates and business decisions as well as project decisions and need direct access to a great deal of high-quality project and business information. A digitally-enabled and continuous learning-based approach will keep future leaders sensitive and capable of planning, creating, and thriving under tomorrow's disruptions.

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

REFERENCES _____

Kerzner, H., Zeitoun, A., & Vargas, R. (2022). Project Management Next Generation: The Pillars for Organizational Excellence. First ed., John Wiley & Sons. https://www.amazon.com/Project-Management-Next-Generation-Organizational/dp/1119832276/ref=sr_1_4?crid=19VAGRR4HTYHH&keywords=project+management+next+generation&qid=1642105176&sprefix=project+management+nex%2Caps%2C68&sr=8-4

Kerzner, H. and Zeitoun, A. (2022). The Connected Future Business Culture: The Great Project Management Accelerator; Introduction to the Series and The Maturing Project Sponsorship, *PM World Journal,* Vol. XI, Issue I, January. https://pmworldlibrary.net/wp-content/uploads/2022/01/pmwj113-Jan2022-Kerzner-Zeitoun-Introduction-and-the-maturing-project-sponsorship-series1.pdf

---

About the Authors

Harold Kerzner, Ph.D., MS, M.B.A

Senior Executive Director for Project Management
International Institute of Learning
New York & Florida, USA

Dr. Harold Kerzner is Senior Executive Director for Project Management for the International Institute for Learning (IIL). He has an MS and Ph.D. in Aeronautical and Astronautical Engineering from the University of Illinois and an MBA from Utah State University. He is a prior Air Force Officer and spent several years at Morton-Thiokol in project management. He taught engineering at the University of Illinois and business administration at Utah State University, and for 38 years taught project management at Baldwin-Wallace University. He has published or presented numerous engineering and business papers and has had published more than 60 college textbooks/workbooks on

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

project management, including later editions. Some of his books are (1) Project Management: A Systems Approach to Planning, Scheduling and Controlling; (2) Project Management Metrics, KPIs and Dashboards, (3) Project Management Case Studies, (4) Project Management Best Practices: Achieving Global Excellence, (5) PM 2.0: The Future of Project Management, (6) Using the Project Management Maturity Model, and (7) Innovation Project Management.

He is a charter member of the Northeast Ohio PMI Chapter.

Dr. Kerzner has traveled around the world conducting project management lectures for PMI Chapters and companies in Japan, China, Russia, Brazil, Singapore, Korea, South Africa, Canada, Ireland, Germany, Spain, Belgium, Poland, Croatia, Mexico, Trinidad, Barbados, The Netherlands, Sweden, Finland, Venezuela, Columbia, United Arab Emirates, France, Italy, England, and Switzerland. He delivered a keynote speech at a PMI Global Congress on the future of project management.

His recognitions include:

- The University of Illinois granted Dr. Kerzner a Distinguished Recent Alumni Award in 1981 for his contributions to the field of project management.

- Utah State University provided Dr. Kerzner with the 1998 Distinguished Service Award for his contributions to the field of project management.

- The Northeast Ohio Chapter of the Project Management Institute gives out the Kerzner Award once a year to one project manager in Northeast Ohio that has demonstrated excellence in project management. They also give out a second Kerzner Award for project of the year in Northeast Ohio.

- The Project Management Institute (National Organization) in cooperation with IIL has initiated the Kerzner International Project Manager of the Year Award given to one project manager yearly anywhere in the world that demonstrated excellence in project management.

- The Project Management Institute also gives out four scholarships each year in Dr. Kerzner's name for graduate studies in project management.

- Baldwin-Wallace University has instituted the Kerzner Distinguished Lecturer Series in project management.

PM World Journal (ISSN:2330-4480)
Vol. XI, Issue VII – July 2022
www.pmworldjournal.com
Series Article

The Connected Future Business Culture:
The Great Project Management Accelerator
Digitally Enabled Estimating Enhancements
by Dr. Harold Kerzner and Dr. Al Zeitoun

- The Italian Institute of Project Management presented Dr. Kerzner with the 2019 International ISIPM Award for his contributions to the field of project management.

Dr. Harold Kerzner can be contacted at hkerzner@hotmail.com

Dr. Al Zeitoun, PgMP, PMI Fellow

Global Future of Work Executive
Siemens DISW
Ohio & Maryland USA

Dr. Al Zeitoun is a Future of Work, business optimization, and operational performance excellence thought leader with global experiences in strategy execution. His experiences encompass leading organizations; delivering their Enterprise Digital and Business Transformation; guiding fitting frameworks implementations; and using his empathy, engineering insights, and collaboration strengths to successfully envision new business models and execute complex missions across diverse cultures globally.

In his current role with Siemens, he is a Senior Director of Strategy responsible for driving the global program management practices, Master Plan governance, and enabling the Strategy Transformation processes and priorities.

In his position, as the Executive Director for Emirates Nuclear Energy Corporation, Abu Dhabi, UAE, he was responsible for creating the strategy execution framework, achieving transformation benefits, governance excellence, and creating the data analytics discipline necessary for delivering on the $40B complex country energy mission roadmap.

At the McLean, USA HQ of Booz Allen Hamilton, Dr. Zeitoun strategically envisioned and customized digitally enabled EPMO advisory, mapped playbooks, and capability development for clients' Billions of Dollars strategic initiatives. Furthermore, he led the firm's Middle East North Africa Portfolio Management and Agile Governance Solutions.

With the International Institute of Learning, Dr. Zeitoun played a senior leader and global trainer and coach. He was instrumental in driving its global expansions, thought leadership, and operational excellence methodology to sense and shape dynamic ways of working across organizations worldwide. He speaks English, Arabic, and German and enjoys good food, travel, and volunteering. Dr. Al Zeitoun can be contacted at zeitounstrategy@gmail.com