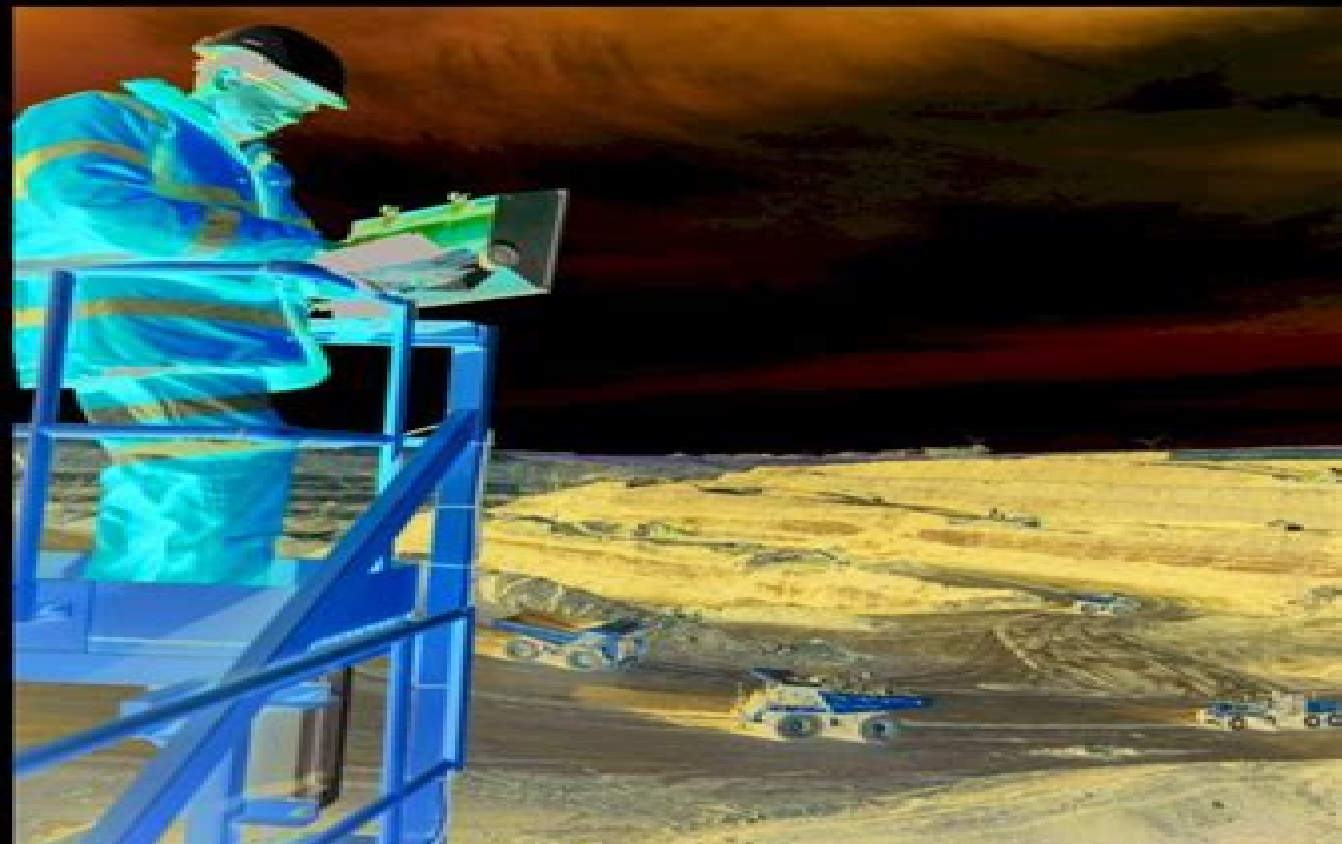


# How digital innovation can improve mining productivity

Metals & Mining November 2015



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# How Digital Innovation Can Improve Mining Productivity

**Walter Frenz**



## **How Digital Innovation Can Improve Mining Productivity:**

Handbuch Industrie 4.0: Recht, Technik, Gesellschaft Walter Frenz, 2020-03-24 Das Handbuch bietet einen Gesamtberblick über Industrie 4.0 und gibt zugleich Lösungen für wichtige praktische Fragen. Ausgangspunkt ist dabei das Recht mit seinen aktuellen Herausforderungen. Zuordnung der Daten wem gehören sie? Vorgaben der EU Datensicherheit Datenschutz Europäische Datenschutzgrundverordnung Cyberangriffe Wettbewerbsrecht Zugangsansprüche gegen Monopolisten zulassung und verbotener Informationsaustausch mögliche Kooperationen. Sodann werden Einzelbereiche von Industrie 4.0 Internet of Production Maschinenbau Künstliche Intelligenz Elektromobilität autonomes Fahren Verkehr Medizin Bauwesen Energiewirtschaft etc. in ihren Besonderheiten beleuchtet. Allgemeine Entwicklungen aus dem Management der digitalen Transformation der Unternehmen und der Arbeitswelt sowie ethische Fragen schließen sich an. **Mining goes Digital** Christoph Mueller, Winfred Assibey-Bonsu, Ernest Baafi, Christoph Dauber, Chris Doran, Marek Jerzy Jaszczuk, Oleg Nagovitsyn, 2019-05-22 The conferences on Applications for Computers and Operations Research in the Minerals Industry APCOM initially focused on the optimization of geostatistics and resource estimation. Several standard methods used in these fields were presented in the early days of APCOM. While geostatistics remains an important part, information technology has emerged and nowadays APCOM not only focuses on geostatistics and resource estimation but has broadened its horizon to Information and Communication Technology (ICT) in the mineral industry. Mining Goes Digital is a collection of 90 high quality peer reviewed papers covering recent ICT related developments in Geostatistics and Resource Estimation, Mine Planning, Scheduling and Dispatch, Mine Safety and Mine Operation, Internet of Things, Robotics, Emerging Technologies, Synergies from other industries, General aspects of Digital Transformation in Mining. Mining Goes Digital will be of interest to professionals and academics involved or interested in the above mentioned areas. *Global Challenges for Innovation in Mining Industries* Alica Daly, David Humphreys, Julio Raffo, Giulia Valacchi, 2022-04-21 People have been digging in the ground for useful minerals for thousands of years. Mineral materials are the foundation of modern industrial society. As the global population grows and standards of living in emerging and developing countries rise, the demand for mineral products is increasing. Mining ensures that we have an adequate supply of the raw materials to produce all the components of modern life and at competitive prices. Innovation is central to meeting the diverse challenges faced by the mining industry. It is critical for developing techniques for finding new deposits of minerals, enabling us to recover increasing amounts of minerals from the ground in a cost effective manner and ensuring it this is done in a way that is as environmentally responsible. This book provides the first in depth global analysis of the innovation ecosystem in the mining sector. This book is Open Access.

**Handbook Industry 4.0** Walter Frenz, 2022-06-22 The handbook presents an overview of Industry 4.0 and offers solutions for important practical questions. The law and its current challenges regarding data assignment: who owns the data? EU guidelines data security data protection General Data Protection Regulation cyberattacks competition law right to access

vs monopolists permissible and prohibited exchanges of information possible collaborations is the point of departure In turn the book explores peculiarities in specific areas of Industry 4.0 Internet of Production mechanical engineering artificial intelligence electromobility autonomous driving traffic medical science construction energy industry etc The book's closing section addresses general developments in management the digital transformation of companies and the world of work and ethical questions

**Extracting Innovations** Martin J. Clifford, Robert K. Perrons, Saleem H. Ali, Tim A. Grice, 2018-06-13 This book considers the most contemporary innovations propelling the extractive industries forward while also creating new environmental and social challenges The socio-ecological fabric of innovation in the extractive industries is considered through an integrative approach that brings together engineers natural scientists and social scientists academics and practitioners giving an empirically grounded and realistic evaluation of the innovations in this sector It synthesizes a series of questions including

Routledge Handbook of the Extractive Industries and Sustainable Development Natalia Yakovleva, Edmund Nickless, 2022-05-30 The Routledge Handbook of the Extractive Industries and Sustainable Development provides a cutting edge comprehensive overview of current trends challenges and opportunities for metal and mineral production and use in the context of climate change and the United Nations Sustainable Development Agenda 2030 Minerals and metals are used throughout the world in manufacturing construction infrastructure production of electronics and consumer goods Alongside this widespread use extraction and processing of mineral resources take place in almost every nation at varying scales both in developing countries and major developed nations The chapters in this interdisciplinary handbook examine the international governance mechanisms regulating social environmental and economic implications of mineral resource extraction and use The original contributions from a range of scholars examine the relevance of the mining industry to the United Nations Sustainable Development Goals (SDGs) reviewing important themes such as local communities Indigenous peoples gender equality and fair trade showing how mining can influence global sustainable development The chapters are organised into three sections Global Trends in Mineral Resources Consumption and Production Technology Minerals and Sustainable Development and Management of Social Environmental and Economic Issues in the Mining Industry This handbook will serve as an important resource for students and researchers of geology geography earth science environmental studies engineering international development sustainable development and business management among others It will also be of interest to professionals in governmental international and non-governmental organisations that are working on issues of resource governance environmental protection and social justice

*Operational Sustainability in the Mining Industry* Hassan Qudrat-Ullah, Pramela Nair Panthallor, 2020-11-05 This book broadly explains the requirement to focus on core components in a business and provides a case study of open pit mining operations throughout the book to understand the management perspective of large organizations With globalized approaches of large businesses and the rising requirement of understanding the needs of modern organizations it is necessary to focus on key areas of businesses to ensure

sustainability of operations Organizations look into achieving a high return on investments and short term measures in increasing sales or revenue is considered unsuitable It is a necessity to look for sustainability and continuous methods of innovation to boost efficiency This book provides a case study based on large organizations and uses qualitative methodologies where data was collected using in depth interviews of respondents from various mining companies in the top and middle level management from different parts of the world detailing the state of the art of information systems currently used in large scale open pit mining LSOPM This book provides a sound knowledge of cutting edge factors to the reader for managing the business to attain operational excellence and long term sustainability and caters to a broad spectrum of management and technical readers

**Mining Haul Roads** Roger Thompson,Rodrigo Peroni,Alex Visser,2019-01-15 Mining haul roads are a critical component of surface mining infrastructure and the performance of these roads has a direct impact on operational efficiency costs and safety A significant proportion of a mine s cost is associated with material haulage and well designed and managed roads contribute directly to reductions in cycle times fuel burn tyre costs and overall cost per tonne hauled and critically underpin a safe transport system The first comprehensive treatise on mining haul road design construction operation and management Mining Haul Roads Theory and Practice presents an authoritative compendium of worldwide experience and state of the art practices developed and applied over the last 25 years by the three authors over three continents and many of the world s leading surface mining operations In this book the authors Introduce the four design components of an integrated design methodology for mining haul roads geometric including drainage structural functional and maintenance management Illustrate how mine planning constraints inform road design requirements Develop the analytical framework for each of the design components from their theoretical basis and using typical mine site applications illustrate how site specific design guidelines are developed together with their practical implementation Summarise the key road safety and geometric design considerations specific to mining haul roads Specify the mechanistic structural design approach unique to ultra heavy wheel loading associated with OTR mine trucks Describe the selection application and management of the road wearing course material together with its rehabilitation including the use of palliatives Develop road and operating cost models for estimating total road user costs based on road rolling resistance measurement and modelling techniques Illustrate the approach of costing a mining road construction project based on the design methodologies previously introduced List and describe future trends in mine haulage system development how mining haul road design will evolve to meet these new system challenges and how the increasing availability of data is used to manage road performance and ultimately provide 24x7 trafficability Mining Haul Roads Theory and Practice is a complete practical reference for mining operations contractors and mine planners alike as well as civil engineering practitioners and consulting engineers It will also be invaluable in other fields of transportation infrastructure provision and for those seeking to learn and apply the state of the art in mining haul roads This book is the most definitive treatise on mining haul roads ever

written There has never been a text that addresses the many facets of mining haul roads on such a scope From the Foreword by Jim Humphrey Professional Engineer Autonomous haulage systems developer and Distinguished Member of the Society of Mining Metallurgy and Exploration Technology-Driven Productivity Improvements and the Future of Work: Emerging Research and Opportunities Roos, Göran, 2017-02-10 While technological developments are evolving at a rapid pace employee workplace skills are falling behind This rate of change will continue to accelerate and it is the responsibility of businesses to provide their employees with a solid foundation for keeping pace with the technology surrounding them Technology Driven Productivity Improvements and the Future of Work Emerging Research and Opportunities provides a comprehensive discussion of the latest strategies and methods for creating harmony between the workplace population and their technological environments Featuring coverage on relevant topics such as STEM skills economic complexities and social programs this is an informative resource for all business owners professionals practitioners and researchers who are interested in discovering new methods that will enable humans and technology to work together *Struggles and Successes in the Pursuit of Sustainable Development* Tay Keong Tan, Milenko Gudic, Patricia Flynn, 2020-06-03 The challenges associated with the struggles for attainment of the Sustainable Development Goals SDGs and objectives are as diverse and complex as the variety of human societies national conditions and natural ecosystems worldwide Despite decades of economic growth and technological advances our world is plagued by poverty hunger disease conflicts and inequality and many societies are under the strain of environmental changes and governance failure Such global scale challenges call for the SDGs to be translated beyond bold concepts and aspirational targets into concrete programs and feasible plans that are substantively valuable locally acceptable pragmatic and operationally implementable In the pursuit of the SDGs positive results are far from guaranteed Success is uncertain Instead the path forward requires difficult learning experimentation and adaptation by multiple stakeholders Loss and sacrifice are foreseeable and often inevitable This important book captures the lessons from ongoing struggles and the early successes Productive failures and emerging practices are identified analyzed and promulgated for interdisciplinary learning by and for the inspiration of like minded individuals organizations communities and nations worldwide They can also inform and enrich the curricula in universities training institutions and schools to prepare future generations of citizens leaders and activists with the ethos and values of sustainability and social responsibility The book offers a platform for academics practitioners and concerned global citizens to identify pathways forward on the immense challenges of sustainability Imagination, Creativity, and Responsible Management in the Fourth Industrial Revolution Fields, Ziska, Bucher, Julien, Weller, Anja, 2019-06-28 As we move through the Fourth Industrial Revolution people are becoming more concerned about the potential benefits and risks of digital technology and its impact People are worried about the extent the implementation and the effect digital transformation will have on their privacy jobs and welfare Business managers will be expected to navigate organizations and employees through this unknown territory of

digital transformation and disruption Imagination Creativity and Responsible Management in the Fourth Industrial Revolution is an essential reference source that uses a multidisciplinary approach to examine the concepts of imagination and creativity as well as responsible management practices and their application to the development and use of innovative technologies This book intends to help readers understand the importance of continuously developing their cognitive skills and to remain responsible and accountable in the new digital era the Fourth Industrial Revolution Featuring research on topics that include modes of interaction in the digitalized era cognitive skills needed and creative tools to shape the future of work and knowledge sharing this book is ideally designed for managers leaders decision makers directors executives engineers entrepreneurs IT specialists academics researchers students consultants and industry professionals

Extractivism and Labour in the Caribbean Dennis C. Canterbury, 2023-12-01 This book explores the impact of resource extraction and the dynamics of great powers competing for natural resources in the Caribbean The book analyzes labour capital relations between China the United States the European Union and Russia in the Caribbean as competition increases with the arrival of non traditional sources of foreign investments in infrastructure from the East Chapters assess these dynamics through varying historical and current forms of worker community and organization resistance in the Caribbean s extractive industries from the 1970s to the present In doing so the book critically analyzes the interplay of extractive capital with labour unions community organizations management and the state particularly regarding the struggle for higher wages improved working conditions and the broader issues of extractive capitalism and underdevelopment dispossession social exclusion and environmental degradation The first book on extractivism and labour in the Caribbean and a major contribution to critical development studies literature it will appeal to policymakers as well as students and scholars in the fields of development studies development economics sociology politics and international relations Labour Disrupted Malehoko Tshoaedi, Andries Bezuidenhout, Janet Cherry, Nomkhosi Xulu-Gama, Mondli Hlatshwayo, Mpho Mmadi, Aisha Lorgat, Siphelo Ngcwangu, Babalwa Magoqwana, Sandla Nomvete, John Mashayamombe, Jantjie Xaba, Lucien van der Walt, Edward Webster, 2023-10 Labour Disrupted reflects on the past and the future of labour primarily in South Africa but also globally It focuses on how South Africa s lockdown during the Covid 19 pandemic further exposed key contradictions and challenges that labour movements face The contributions include a diverse range of topics currently engaged with by those actively engaged in the field of labour movement Essays by academics and activists tackle thorny issues from redefining democracy in South Africa to experiences of inclusiveness or lack thereof in workplace environments by women young people migrant workers LGBTI people and people living with disabilities The volume addresses contemporary issues related to the use of technology and the impact of the fourth industrial revolution on the youth and the working class and the challenges of skills development and restructuring in the workplace Publisher **Advances in raw material industries for sustainable development goals** Vladimir Litvinenko, 2020-12-29 Advances in Raw Material Industries for Sustainable

Development Goals presents the results of joint scientific research conducted in the context of the Russian German Raw Materials Forum Today Russia and Germany are exploring various forms of cooperation in the field of mining geology mineralogy mechanical engineering and energy Russia and Germany are equally interested in expanding cooperation and modernizing the economy in terms of sustainable development The main theme of this article collection is connected with existing business ventures and ideas from both Russia and Germany In this book the authors regard complex processes in mining industry from various points of view including modern technologies in prospecting exploration and development of mineral resources progressive methods of natural and industrial mineral raw materials processing energy technologies and digital technologies for sustainable development cutting edge technologies and innovations in the oil and gas industry Working with young researchers supporting their individual professional development and creating conditions for their mobility and scientific cooperation are essential parts of Russian German Raw Materials Forum founded in Dresden 13 years ago This collection represents both willingness of young researchers to be involved in large scale international projects like Russian German Raw Material Forum and the results of their long and thorough work in the promising areas of cooperation between Russia and Germany *Proceedings of the 27th International Symposium on Mine Planning and Equipment Selection - MPES 2018* Eleonora Widzyk-Capehart,Asieh Hekmat,Raj Singhal,2019-02-21 This proceedings book presents research papers discussing the latest developments and findings in the fields of mining machinery automation and environmental protection It includes contributions from authors from over 20 countries with backgrounds in computer science mining engineering technology and management and hailing from the government industry and academia It is of interest to scientists engineers consultants and government staff who are responsible for the development and implementation of innovative approaches techniques and technologies in the mineral industries Covering the latest advances in fundamental research it also appeals to academic researchers

**Digital Transformation for the Process Industries** Osvaldo A. Bascur,2020-10-27 Imagine if your process manufacturing plants were running so well that your production safety environmental and profitability targets were being met so that your subject matter experts could focus on data driven business improvements Through proper use and analysis of your existing operations data your company can become an industry leader and reward your stakeholders Written in an engaging and easily understandable manner this book demonstrates a step by step process of how an organization can effectively utilize technology and make the necessary culture changes to achieve operational excellence You will see how several industry leading companies have used an effective real time data infrastructure for mission critical business use cases The book also addresses challenges involved such as effectively integrating operational OT data with business IT systems to enable a more proactive predictive management model for a fleet of process plants Some of the things you will take away Learn how a real time data infrastructure enables transformation of raw sensor data into contextualized information for operational insights and business process improvement



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*Por Qué Cambiar La Forma De Hacer Minería En Chile*  
Juan H. Rojas Cortés, 2017-11-17 Un emocionante viaje a las preguntas Por qué cambiar la forma de hacer minera Cules son sus fundamentos Por qué es una oportunidad mayor para sus profesionales Qué y cómo hacer para que la minera chilena alcance estándares de desempeño que le permitan seguir siendo el motor del desarrollo económico del país y liderar la industria multinacional desde Chile Nuestro prestigio como profesionales está en riesgo cada vez que perdemos el ritmo de los cambios El mundo está avanzando vertiginosamente y si no mantenemos el paso nos pasará por el lado Las oportunidades para el diseño de nuestras posibilidades futuras tanto para nosotros como personas como para nuestras organizaciones están en desafiar las tradiciones de ingeniería y gestión y en general los supuestos básicos que dan cuenta de ese paradigma de base que conforma la actual forma de hacer minera en Chile Cómo se desafían esas tradiciones Primero configurando una línea base representativa de lo que es en la industria y seguidamente proponiendo acciones concretas hacia el logro de lo que debiera ser cero accidentes más productividad y más rentabilidad El marco teórico y las aplicaciones prácticas que respaldan esta metodología de mejoramiento continuo hacia la excelencia operacional es una oportunidad real para los negocios de la industria y también para aumentar la cotización de sus profesionales Las distinciones que trae precisan las competencias profesionales que se requieren en estos tiempos Una materia que las casas de estudios superiores debieran considerar en sus programas de formación para lograr un acercamiento real a las necesidades del negocio minero de Chile

*Enhancing Public Sector Accountability and Services Through Digital Innovation*  
Santos Ferreira, Augusta da Conceição, Lourenço dos Santos, Carlos Alberto, 2025-05-30 Digital innovation reshapes the way governments operate offering powerful tools to enhance transparency efficiency and citizen engagement in the public sector By leveraging technologies like data analytics cloud computing AI and blockchain public institutions can streamline service delivery reduce inefficiencies and strengthen accountability These digital advancements improve access to public services while enabling real time monitoring open data initiatives and participatory governance models that empower citizens and build trust As governments face increasing

pressure digital innovation presents a transformative opportunity to reimagine public administration for a more inclusive responsive and accountable future Enhancing Public Sector Accountability and Services Through Digital Innovation explores the use of technologies and information systems which promote the modernization of the public sector entities It examines the assessment of their social economic and financial impact and the improvement of accountability sustainability and operational performance This book covers topics such as citizen engagement policymaking and service delivery and is a useful resource for policymakers business owners government officials academicians researchers and data scientists

Mining Law and Governance in Africa Victoria R. Nalule,2023-06-09 This book explores the various issues that characterise the African mining sector drawing examples from different African countries and regional organisations Although there is a massive literature on the subject some issues have been neglected including the crucial role of digitalisation and technological advancement in resolving the environmental and social challenges faced in Artisanal and Small Scale Mining ASM deep sea mining mining contract negotiations and modernising mining laws to reflect the increasing role of critical minerals to mention but a few Therefore the book unpacks the critical issues associated with the mining sector explicitly reflecting on the practical solutions needed to address the challenges in the African mining sector This book uniquely analyses and adds flavour to international mining s fundamental concepts by describing a simulated annealing based approach appropriate for complex mining projects in Africa Book contributors comprise of academics from different universities including professors practitioners government policymakers NGO executives and a variety of different experts This multidisciplinary book will be of interest to African policymakers governments academics industry professionals energy and mining institutions international organisations universities across the globe and companies

La transformation digitale Sergio Vasquez Bronfman,2024-01-24 Comment conduit on la transformation digitale au sein d une organisation et quelles en sont les tapes La transformation digitale peut elle contribuer cr er un avantage concurrentiel Comment peut on surmonter la r sistance au changement Quelles t ches doit on ou non d l guer l intelligence artificielle Ce manuel est construit comme un guide pratique pour les tudants en cole de commerce ou ing nieurs Master et Executive port par un acteur de la transformation digitale il en propose une vision globale et historique en insistant sur le concept de transformation plut t que sur celui de digital Le livre fournit des grilles d analyse pour comprendre et concevoir un processus de transformation digitale notamment en le reliant la strat gie de l entreprise et en s appuyant sur de nombreux cas d industries dans tous types de secteurs Il aborde galemment le probl me cl du pilotage et de la gestion du changement en se focalisant sur la r sistance au changement et ses causes notamment les conflits li s au pouvoir et propose une approche agile Le livre est enrichi de ressources num riques tudes de cas et liens vers des vid os pour les tudants Note p dagogique des tudes de cas pour les enseignants

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