

Fabbrica Futuro
Bari, 24 ottobre 2017

Industria 4.0, sostenibilità e cambiamento organizzativo

Barbara Scozzi
DMMM, Politecnico di Bari



Politecnico
di Bari

Agenda

- Finalità della presentazione
- Industria 4.0
- Tecnologie e cambiamento organizzativo: cosa possiamo imparare dalle esperienze del passato?
- Processi aziendali, Business Process Management (BPM) e recenti evoluzioni
- Il S-BPM per Industria 4.0 e la sostenibilità
- (Esperienza del) Centro di Competenza sul BPM
- Conclusioni e Call for (collabor)action

Finalità della presentazione - La tesi

Adottando l'approccio del (Sustainable) Business Process Management le imprese possono sfruttare le opportunità offerte dalle tecnologie di I4.0 e raccogliere la sfida dello sviluppo sostenibile

Industria 4.0 ma anche **Smart Manufacturing, Factory of the future, Digitization of manufacturing...**

“...dramatically intensified and pervasive application of **networked information-based technologies** throughout the manufacturing and supply chain enterprise” (Davis et al., 2012)

“...autonomous, knowledge and sensor based, self-regulating production systems” (Lasi et al., 2014)

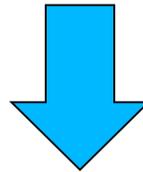
“the fusion of virtual and real worlds and the application of **digitization, automation, and robotics** in manufacturing” (Gotz and Jankowska 2017)

Focus su tecnologie e la domanda è: che impatto tutto questo avrà su lavoro, imprese e società?

Industria 4.0

Due scuole di pensiero (Bartezzaghi et al 2017):

- Miglioramento delle prestazioni dei processi produttivi (es. Lorentz et al., 2016)
- Opportunità legate alla costituzione di nuovi modelli di business (es. Kautzsch et al., 2016)



- Cambia la natura della relazione fra tecnologie e lavoro umano
- E' necessario innovare (più o meno radicalmente) i processi di produzione

Tecnologia e cambiamento organizzativo

The relationship between information technology and organizational change is a central concern in the field of Information Systems (IS). In the 30 years since Leavitt and Whisler's (1958) seminal article, "Management in the 1980's," speculations on the role of information technology in organizations and its implications for organizational design have flourished. Few researchers in the IS field question the importance of the issue. In an empirical investigation of literature citation patterns, Culnan (1986) traced the origins of the IS field to Leavitt and Whisler's article and identified "computer impacts" as a clear subfield within it.

Unfortunately, the literature on information technology and organizational change does not currently support reliable generalizations about the relationships between information technology and organizational change. There are several reasons for this.

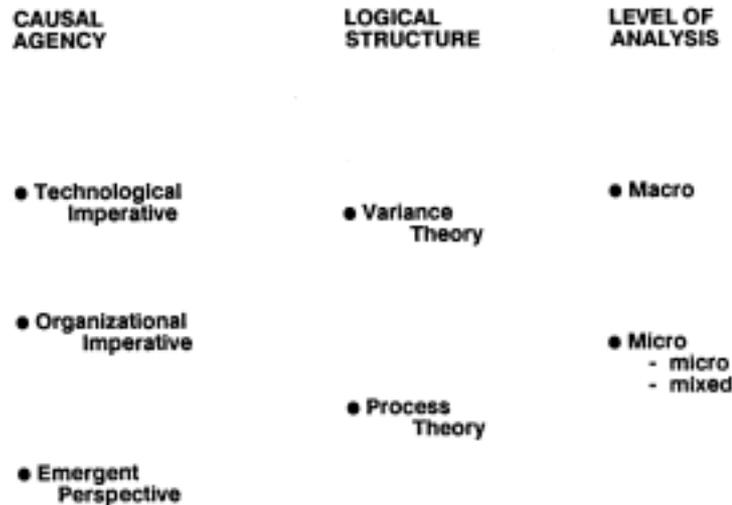


FIGURE 1. Dimensions of Causal Structure.



Information Technology and Organizational Change: Causal Structure in Theory and Research

M. Lynne Markus, Daniel Robey

Management Science, Volume 34, Issue 5 (May, 1988), 583-598.

Stable URL:

<http://links.jstor.org/sici?sici=0025-1909%28198805%2934%3A5%3C583%3AITAOC%3E2.0.CO%3B2-1>

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

Management Science is published by INFORMS. Please contact the publisher for further permissions regarding the use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/informs.html>.

Management Science
©1988 INFORMS

JSTOR and the JSTOR logo are trademarks of JSTOR, and are Registered in the U.S. Patent and Trademark Office. For more information on JSTOR contact jstor-info@mit.edu.

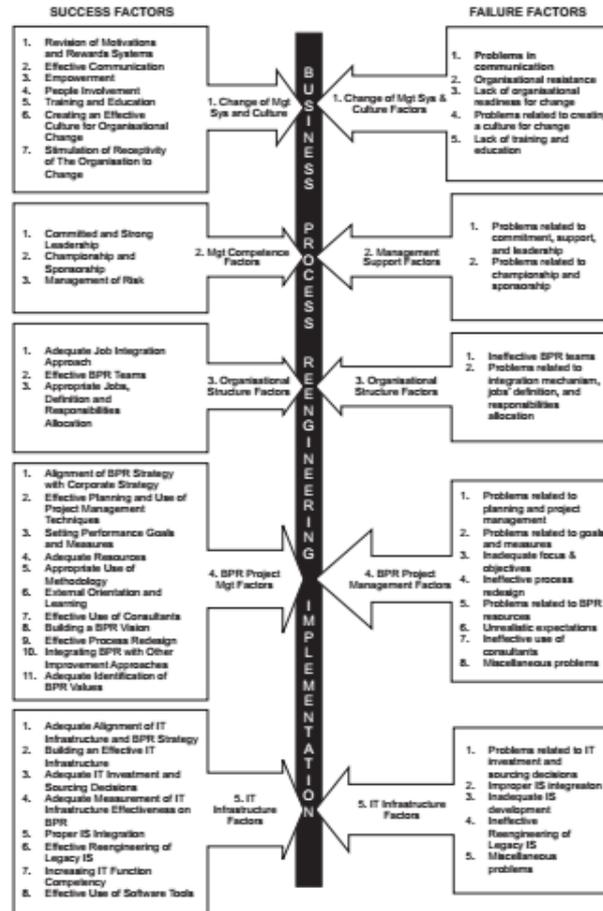
©2002 JSTOR

<http://www.jstor.org/>
Mon Jun 21 10:37:09 2002

M. Lynne Markus and Daniel Robey, Information Technology and Organization Change, 1985, Management Science 34(5)

Tecnologie e cambiamento organizzativo: l'esperienza del Business process reengineering

Numerosissime le esperienze e i lavori riguardanti il successo e il fallimento legato all'implementazione di sistemi informativi (es. Bashein et al., 1994; Al mashairi and Zairi, 1999)



BPR implementation process: an analysis of key success and failure factors

Majed Al-Mashari and Mohamed Zairi
Bradford University Management Centre, Bradford, UK

Keywords: BPR, Implementation, Process management, Success

Abstract: This paper presents a holistic view of the Business Process Re-engineering (BPR) implementation process. It reviews the literature relating to the hard and soft factors that cause success and failure for BPR implementation, classifies these factors into subgroups, and identifies key factors of success and failure. Finally, it explains how these factors influence the process of BPR implementation.

Introduction
Following the publication of the fundamental concepts of BPR by Hammer (1990) and Davenport and Short (1990), many organisations have reported dramatic benefits gained from the successful implementation of BPR. Companies like Ford Motor Co, CIGNA, and Wal-Mart are all recognised as having successfully implemented BPR.

However, despite the significant growth of the BPR concept, not all organisations embarking on BPR projects achieve their intended result. Hammer and Champy (1993) estimate that as many as 70 percent do not achieve the dramatic results they seek. Having BPR repeatedly at the top of the list of management issues in annual surveys of critical information systems reflects executives' failure to either implement properly or acquire the benefits of BPR (Alber, 1994). This mixture of results makes the issue of BPR implementation very important. BPR has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction, but it often requires a fundamental organisational change. As a result, the implementation process is complex, and needs to be checked against several success/failure factors to ensure successful implementation, as well as to avoid implementation pitfalls.

The following analyses the BPR implementation process by reviewing the relevant literature on both soft and hard factors that cause success and failure of BPR efforts. The factors listed below are distilled from various articles and empirical research on BPR implementation. They were then categorised into a number of subgroups representing various dimensions of change related to BPR implementation. These dimensions are:

- change management;
- management competency and support;
- organisational structure;

Al-Mashari, Majed, and Mohamed Zairi. "BPR implementation process: an analysis of key success and failure factors." *Business process management journal* 5.1 (1999): 87-112.

Bashein, Barbara J., M. Lynne Markus, and Patricia Riley. "Preconditions for BPR success and how to prevent failures." *Information System Management* 11.2 (1994): 7-13.

Industria 4.0 e cambiamento organizzativo

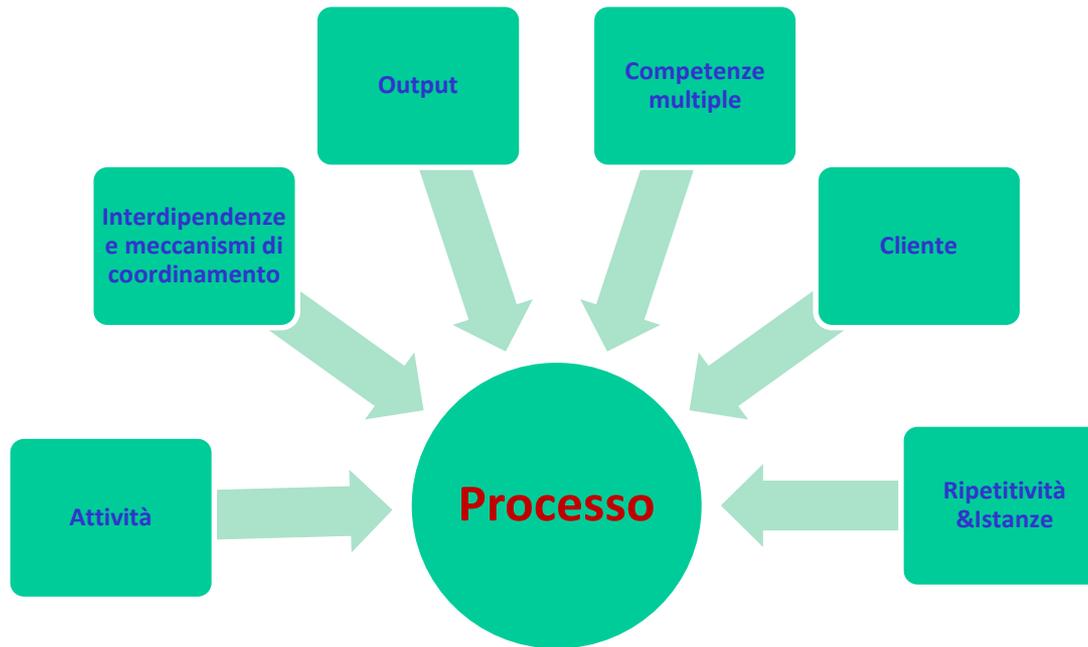
Rischio che si corre oggi è quello di **adottare l'approccio dell'imperativo tecnologico** (o peggio libidine tecnologica) e **ripetere errori del passato**

Necessità di ricorrere a approcci che si basino su:

- **Emergent perspective** → i cambiamenti organizzativi dipendono dall'interazione fra persone, eventi e tecnologia. Il successo legato alla implementazione di una tecnologia dipende da una conoscenza approfondita dei processi organizzativi, degli attori coinvolti nei processi e degli aspetti delle tecnologie
- **Process theory** → studiare l'organizzazione, nel processo di implementazione delle tecnologie, adottando un approccio per processi

Organizzazione: approccio per processi

- **Processo** = Una attività o un **insieme di attività interdipendenti** che trasformano, aggiungendovi **valore**, input in output da destinare a un **cliente** interno o esterno all'organizzazione (Harrington, 1991)



Organizzazione: approccio per processi

- Progettazione processi coerente con visione strategica
- Focus sul cliente
- **Gestione coordinata di tutte le attività: il process owner**
- L'importanza della mappatura: *Non so quello che faccio fino a quando non vedo quello che dico*
- **Training e formazione per avere visione di insieme**
- Condivisione informazione
- Empowerment
- **Monitoraggio delle prestazioni**
- **Gestione condivisa delle stesse facilities**
- Esecuzione automatica dei processi
- **Compensi e percorsi di carriera**



INDEX TO HBR'S 1999 ARTICLES 199	
PHIL FORD AND THOMAS S. WORTER	Getting Real About Virtual Commerce 84
WILLIAM A. SACHMAN	The New Economy Is Stronger Than You Think 99
MICHAEL HAMMER AND STEVEN STANTON	How Process Enterprises Really Work 108
MICHAEL E. FORBES AND MARK A. HANES	Philanthropy's New Agenda: Creating Value 121
DIRK J. RUCKER AND ERIC JOACHIMSTHALER	The Loss of Global Branding 137
ALFRED MATHIASZ AND MARIL STEINER	Stock or Cash? The Trade-Off for Buyers and Sellers in Mergers and Acquisitions 147
DAI GAMA AND MICHAEL WITKINS	The Successor's Dilemma 160
ROBERT GAFFNEY	FOCUS TOPIC: President's Jay Walker, U.S. microcredit programs, delegation strategies, and more. 19
WILLIAMS L. FOSTER	What's He Waiting For? 37
SUSAN ENSHIP	FOCUS TOPIC: The Strategic Power of Saying No 50
J. WARREN MUGELAN	SOCIAL ENTERPRISE: Working on Nonprofit Boards: Don't Assume the Shoe Fits 64
JOSEPH L. BARABASO, JR.	BOOKS IN REVIEW: How Free Are Free Agents? 169
WILLIAM HICKER, JR., AND DONALD L. WASS	Management Time: What's Got the Monkey? with Commentary by Stephen R. Covey 178
STRATEGIC HORIZON 132 LETTERS 169 EXECUTIVE SUMMARIES 214	

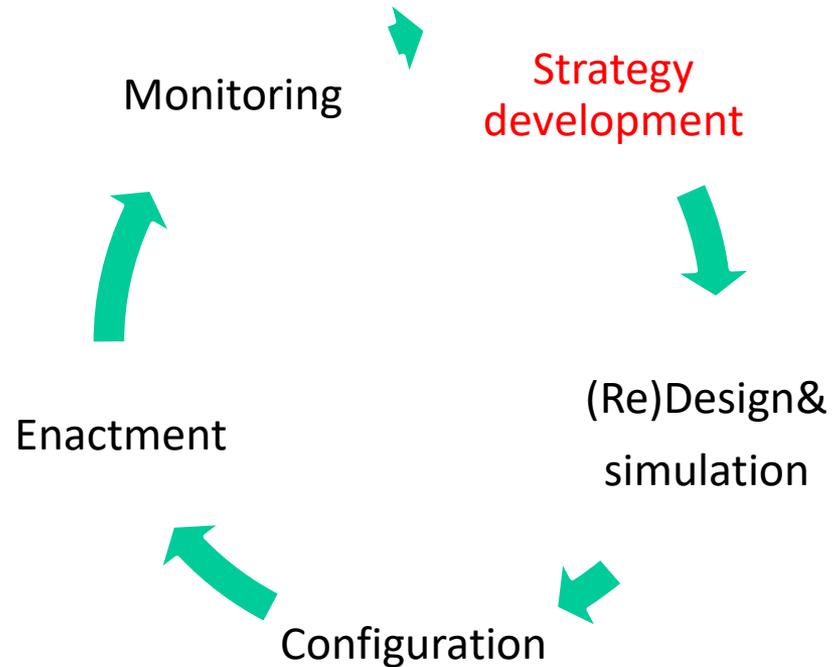


Hammer, Michael, and Steven Stanton. "How process enterprises really work." *Harvard business review* 77 (1999): 108-120.

Organizzazione: approccio per processi

“The main advantage of process theories is that they can deal with more complex causal relationships than variance theories. Also they embody a fuller description of the steps by which inputs and outputs are related, rather than noting the relationship between the levels of input and output variables. Specifically, representing a process as a sequence of activities provides insights into the linkage between individual work and processes, since individuals perform the various activities that comprise the process. As individuals change what they do, they change how they perform these activities and thus their participation in the process” (Crowston 2003)

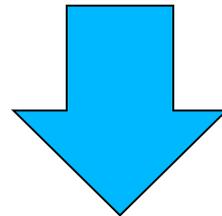
Business Process Management (BPM)



Il ciclo di vita del BPM

Evoluzioni recenti del BPM: verso il S-BPM

- Exploitive vs. explorative BPM (Rosemann, 2014)
- BPM e Soft System Methodology (Checkland, 1995) per il redesign dei processi «fattibile e desiderabile»
- Green Business Process Management (Vom Brocke et al., 2012)

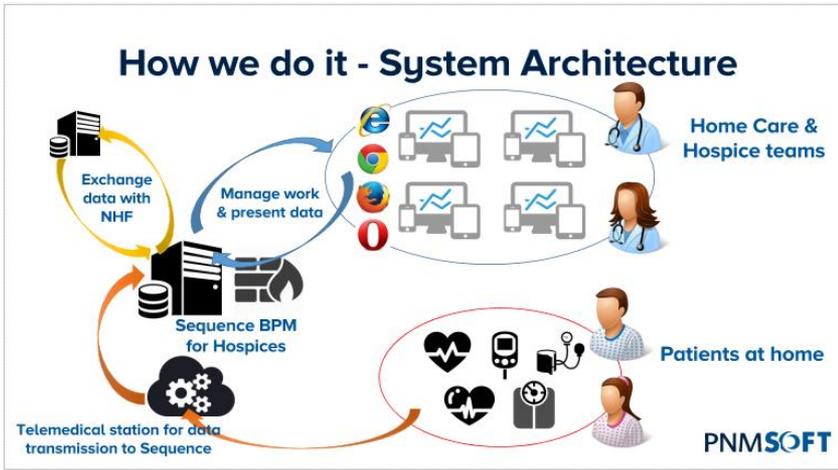


**Sustainable business process
management (S-BPM)**

Il S-BPM per I4.0 e la sostenibilità: perchè?

Consente di innovare i processi anche facendo leva sulle tecnologie Industria 4.0 in maniera tale che le innovazioni introdotte siano fattibili, desiderabili e sostenibili, la conoscenza sul processo sia sempre condivisa, i processi digitalizzati siano lean, siano condivise in tempo reale informazioni su avanzamento e prestazioni del processo, sia possibile studiare la relazione lavoro individuale – processi

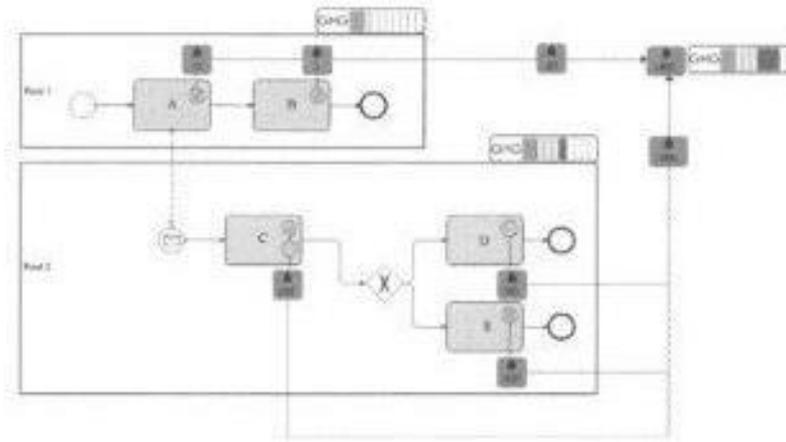
Il BPM per I4.0 e la sostenibilità: esempi



Caso 1: Homecare di PNMSOFT - BPM and IoT nel settore sanitario: il caso

Caso 2: Direct invoicing process della Seamless Service Proviton – Mappatura del processo con notazione estesa per supportare impatto ambientale delle specifiche attività e emissione di GHG+Actiity based emmission analyss per supportar ela riprogettazione

Construct	Notation	Specifications
Fuel consuming activity		This notation is attached to an activity that produces CO ₂ by using fuel as main source. Examples include business travels, transportation, and others.
Paper consuming activity		This notation is attached to an activity that produces CO ₂ by using paper. Examples include creating paper invoice, filing paper report, and others.
GHG emission indicators	or	These notation constructs can be assigned to each pool or swim lane to indicate the level of GHG (usually CO ₂) emission in the relevant (part of the) process. Color coding can be used to display the overall level of GHG emission in the process. Else, the precise amount of GHG emissions produced can be specified.
GHG flow		The GHG flow construct is used to show the flow of GHG in a process and to connect emission producing activities to the GHG emission indicators.



Centro di Competenza sul BPM

- Nascita nel Febbraio 2017
- Partnership strategica fra Politecnico di Bari e Openwork srl
- Si occupa di:
 - Didattica: tesi, tirocini e project work
 - Ricerca: BPM *reachness* e *richness* (Industria 4.0, Sustainable Business Process Management, Case Management)
 - Terza missione: trasferimento tecnologico, formazione continua e social engagement
- Si propone di creare una relazione stretta con il tessuto imprenditoriale locale (e non) in modo da innescare circoli virtuosi



Centro di Competenza sul BPM

- Project work svolti in oltre 50 imprese del territorio
- Oltre 20 tesi
- Progetto Innonetwork (Sanità) e Proposta Innolabs (Open Manufacturing)
- Il BPM per abilitare il funzionamento di una rete di imprese in ottica di open manufacturing (**Lorenzo Fiore, Francesco Petrone, Francesco Fornaro, Federico Blanda**)
- Analisi e riprogettazione del lead flow process: il caso Bonitasoft (**Ettore Rosati**)
- Il Business Process Management per la gestione delle campionature: il caso SKF Industrie s.p.a. (**Noemi Fiore**)
- Analisi e riprogettazione del processo di vendita in un Technical Research Center: un caso di studio (**Nicola Riccio**)
- Il bpm per la sanita': un caso di studio (**Monica Mangieri**)

Conclusioni

- BPM presentato come approccio che permette di cogliere opportunità tecnologie I4.0 e di raccogliere la sfida della sostenibilità
- Invito a collaborare con il Centro di Competenza per la crescita del territorio

Grazie

Barbara Scozzi

barbara.scozzi@poliba.it