THE AGILITY OF BUSINESS PROCESS IMPROVEMENT

Xueyuan Liu
John Sharp
Bing Deng

SCIENCE PRESS
BEIJING

THE AGILITY OF BUSINESS PROCESS IMPROVEMENT

Xueyuan Liu
John Sharp
Bing Deng

SCIENCE PRESS
BEIJING

Responsible Editress: Lin Jian

Brief Introduction

Agility, a modern management concept, is the ability to thrive and prosper in a continuous changing and competitive environment. Currently, agile theories are still very much general and mainly covering manufacturing. Business processes that are focusing on the administrative and supporting processes, are said to be the heart of any enterprise and the major cost factor in most companies. Therefore, improving business processes is becoming a major competitive weapon in the 21st century. In an attempt to link agility and business processes within a real business environment, this research was designed to identify the factors that affect the development of agility in the business process improvement (BPI) in a UK luxury car manufacturing context.

The results suggest that the existing agile theories need to be further strengthened in the areas of communication, motivation, the scope of empowerment, people's training and development (T&D) and the flattening of management structure which are the major factors limiting the development of agility in this unique business environment. These findings have made a major contribution to the study of agility by identifying the barriers of agility within the business processes in a UK luxury car-manufacturing context. Based on that, the unique agile BPI framework was further modified to demonstrate the inter-relationships between agility and BPI for further academic studies or industrial practices.

ISBN 978-7-03-024799-5

Acknowledgement

I'm greatly indebted to Professor John Sharp and Dr. Edward Doran, who are always my reliance throughout the research. Their timely encouragement, specialist knowledge and invaluable suggestions have guided me through all the difficulties, whether that's academic, financial, or emotional. Their efforts can never and will never be forgotten.

I'm also very grateful to Salford Business School of the University of Salford, and the Economics and Management School of Wuhan University for providing financial support to this research and its publication.

I own a debt of gratitude to the many advisors, both formal and informal, and my colleagues and friends who provided valuable advices and supports along the way: Professor Khairy Kobbacy's constant encouragement, Dr. John Davies and Dr. Alison Rudder's constructive assessment on my interim report, Dr. Peter Schofield and Dr. Aris Syntetos' internal evaluation, Dr. Sudi Sharifi, Dr. Tony Conway, Professor Roger Mason, Dr. Christopher Bamber, Dr. David Bamber, Dr. Hui Yang and Mr. Edward Gould's precious suggestions on my research, Ms Angela Tivey and other colleagues and staff's unreserved helps and supports, and my friend, Mr Limin Wang and his wife, Chengyi Wen's continuous encouragements.

I would especially like to thank many people from the case study company who participated or provided great insights, information and support for this research, though I cannot list all of their names here.

Last but not least, I'd like to thank my wife, Bing Deng, my daughter, Jiaxi Liu, and my other family members and relatives for their countless sacrifices, determined support and endless love. This work, by all means, belongs to them as well.

Declaration

The authors would like to declare that part of this research results has been used for a conference presentation in the 9th International Conference of Quality Management and Organisational Development held in Liverpool during 8th -12th August, 2006 and a paper entitled with "The Agility of Business Process Improvement in a UK Luxury Car Manufacturing Company" on its proceeding (Liu & Sharp, 2006), and the 2nd International Conference of Operations and Supply Chain Management (SCM) held in Taipei during 29th July to 2nd August, 2008, and a paper entitled with "Business Process Improvement in a UK Luxury Car Manufacturer (KCM)" published on its proceeding (Liu & Sharp, 2008).

Glossary of Terms and Abbreviations

AEKO	Change Request
AM	Agile Manufacturing
BPI	Business Process Improvement
BPO	Business Process Orientation
BPR	Business Process Reengineering
BSC	Balanced Scorecard
CEO	Chief Executive Officer
CI	Continuous Improvement
COP	Carry Over Parts
CP4	Check Point 4 (Completion of engine build)
CRM	Customer Relations Management
CV	Commercial Vehicle
DDKM	Digital Data Control Model
DKM	Data Control Model
DMU	Digital Mock Up
DTI	Department of Trade and Industry
ESP	Engineering Service Provider
FDI	Foreign Direct Investment
HLS	Higher Luxury Sector
HoD	Head of Department
HVAC	Heating, Venting and Air Conditioning
IS	Information System
ISO	International Standard Organisation
IT	Information Technology
JIT	Just-In-Time
KM	Knowledge Management
KPI	Key Performance Indicator
LCM	Luxury Car Manufacturer
LM	Lean Manufacturing
LP	Lean Production
MMI	Man Machine Interface
MoB/MB	Member of Board
MP	Mass Production
NVH	Noise, Vibration and Harshness
O&M	Organisation & Methods

OICA	Organisation Internationale des Constructeurs d'Automobiles (The International Organisation of Motor Vehicle Manufacturers)
PDR	Performance Development Review
PDB	Product Specification Book
PEP	Product Emergence Project
PSK	Product Strategy Committee
QCD	Quality, Cost & Delivery
RFID	Radio Frequency Identification
S-Team	Simultaneous Team
SCM	Supply Chain Management
SE	Senior Engineer
SME	Small to Medium Size Enterprise
SMMT	The Society of Motor Manufacturers and Traders Ltd.
SoFa	Summer Test Drive
SoP	Start of Production
SSI	Sales Satisfaction Index
SSM	Soft Systems Methodology
T&D	Training and Development
TPM	Total Preventative Maintenance
TPS	Toyota Production System
TQM	Total Quality Management
ULS	Upper Luxury Sector
USM	U.S. Motors
VoWa	Front end buck
WiFa	Winter Test Drive
WTO	World Trade Organisation

Contents

List of Tables

List of Figures

An Introduction

1.1 Chapter introduction

In this chapter, the research background and necessity will be discussed, and the research rational will be defined. Research aims and objectives will then be clarified, followed by the research questions and a brief introduction of the research philosophy and methodology. The contributions and limitations of this research will also be raised in a general sense. Finally, an outline is provided on how it is organised and what is to be discussed and presented in each chapter.

1.2 Research Background

1.2.1 Dynamic market and various 'panaceas'

With the development of information and communication technology such as internet and mobile phones, the promotion of World Trade Organisation (WTO), the improvement of ocean and air mass transport, and local governments' encouragement of foreign trade and Foreign Direct Investment (FDI), business is becoming more and more globalised and the competition becomes worldwide (Yip, 1999; Johnson & Scholes, 2002; Kotler & Armstrong, 2004). According to WTO (2005), the volume of merchandise trade export, as shown in Figure 1.1 and Table 1.1, has been accelerating, and in 2004, it rose by 9%, the highest since 2000, and it is largely because of the dynamic performance of trade in manufacture which expanded by 10%, or twice as fast as in 2003. From Table 1.1, it can be seen that the annual world export of manufacture during 2000-2004 was 9%, and in 2004, the expansion had gone up to 20% of the previous value. Despite the weak dollar and the roaring prices of crude oil and other raw materials, WTO (2005) still estimated that the volume of world merchandise trade would rise by 6.5 per cent in 2005 (Note: the 2005 annual report hasn't been published yet to the date of submission of this thesis), and world trade growth should accelerate again to around 7.0 per cent in 2006 after the adjustment of price and exchange rate changes, provided the world economy recovers moderately in 2006.

Together with the globalisation is the customers' ever-changing and more and more

diversified and individualised requirements (Kotler & Armstrong, 2004).

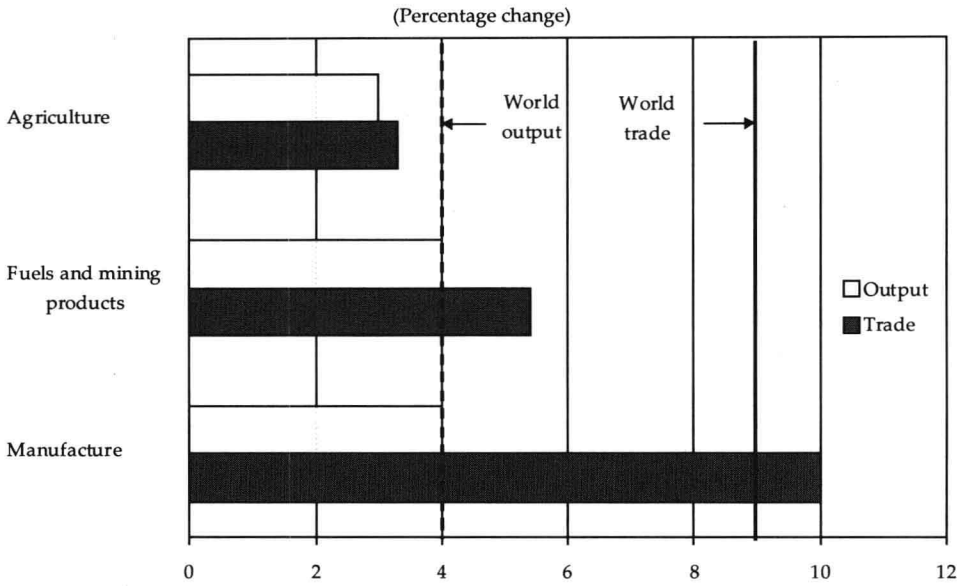

Figure 1.1 Volume growth of world merchandises trade and output by sector in 2004 (Source: WTO, 2005)

Table 1.1 World exports of merchandise and commercial services, 2000-04

	Value(billion dollars)	Annual percentage change			
	2004	2000-04	2002	2003	2004
Merchandise	8907	9	5	17	21
Agricultural products	783	9	6	16	15
Fuels and mining products	1281	10	0	23	32
Manufacture	6570	9	5	16	20
Commercial services	2125	9	7	14	18
Transportation	500	10	4	14	23
Travel	625	7	4	10	18
Other commercial services	1000	11	10	16	16

(Source: WTO, 2005)

To cope with these changes and build up competitive advantage in this globalised market, researchers and practitioners are trying all their means to help increase their

productivities and market shares by driving down the cost, improving the quality, shortening the lead time to the market of their new products and maximising their products' varieties (Waller, 1999; Russell & Taylor, 2002; Slack & Lewis, 2002). As a result, many strategies and techniques have been developed throughout time to help companies tackle their individual problems and improve their competitiveness.

As shown in Table 1.2, from the earlier industrialisation age to the 2000s, events, concepts, theories and technologies such as the streamline Mass Production (MP) with standardisation (Komacek, 1990), the Lean Production (LP) (Womack, 1990; 2003) which incorporates JIT (Ohno, 1988; Hutchins, 1999), Kanban (Ohno, 1988), Kaizen (Imai, 1986) and TQM (Oakland, 1993), have helped greatly to drive down the cost, improve the quality, and therefore, achieve the competitive advantage. But in this modern globalised and ever-changing business environment, this is not enough (Kidd, 1994), and new theories and techniques or methods have been, and are still being, proposed to improve the response to change and satisfy the customers' individual requirements. Among them, the relatively modern ones are AM (Nagel, Dove, Goldman & Preiss, 1991; Kidd, 1994), BPI (Harrington, 1991; Harrington, Esseling & Nimwegen, 1997; McCormack & Johnson, 2001; McCormack & Rauseo, 2005), the BSC management system (Kaplan & Norton, 1992; 1996; 2001), Six Sigma philosophy (Eckes, 2003) and the RFID technology (RFID Journal, 2004).

Table 1.2 Historical events and concepts in operations management

Era	Events/concepts	Dates	Main Contributors
Industrial revolution	Steam engine	1769	James Watt
	Division of labour	1776	Adam Smith
	Interchangeable parts	1790	Eli Whitney
Scientific management	Principles of scientific management	1911	Frederick W. Taylor
	Time and motion study	1911	Frank & Lillian Gilbreth
	Activity scheduling chart	1912	Henry Gantt
	Moving assembly line	1913	Henry Ford
Human relations	Hawthorne studies	1930	Elton Mayo
	Motivation theories	1940s	Abraham Maslow
		1950s	Frederick Herzberg
		1960s	Douglas McGregor
Operations research	Linear programming	1947	George Dantzig
	Digital computer	1951	Remington Rand
	Simulation, waiting line theory, decision theory, PERT/CPM	1950s	Operations Research Group
	MRP, EDI, EFT, CIM	1960s, 1970s	Joseph Orlicky, IBM and others
Quality revolution	Just-In-Time (JIT) & Kanban	1970s	Taiichi Ohno (Toyota)
	Total Quality Management (TQM)	1980s 1986	W. Edwards Deming; Joseph Juran