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Politecnica



# Politecnico di Torino

XVI SUMMER SCHOOL 2011

FRANCESCO TURCO



XVI Summer School "Francesco Turco" Impianti Industriali Meccanici  
Abano Terme (Padova, Italy) - 14-16 September 2011



## RESEARCH GROUP FOR ENGINEERING SYSTEMS & LOGISTICS



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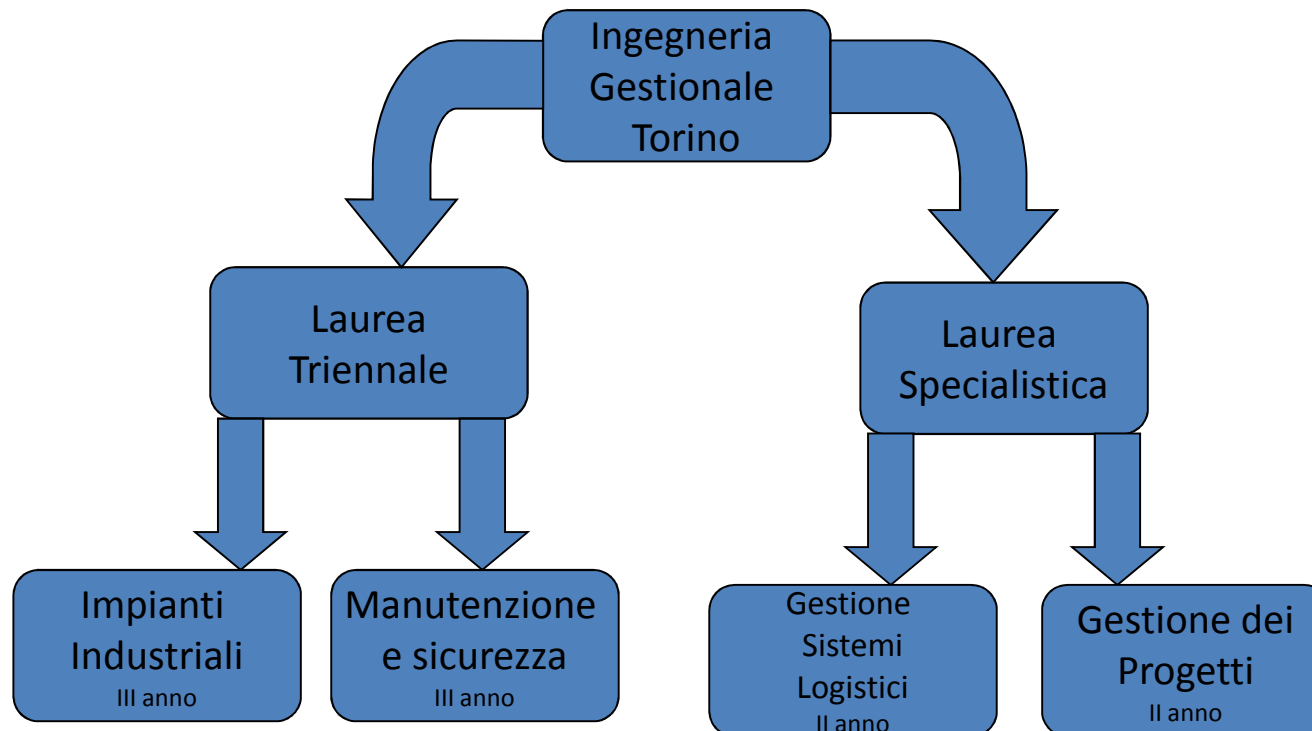
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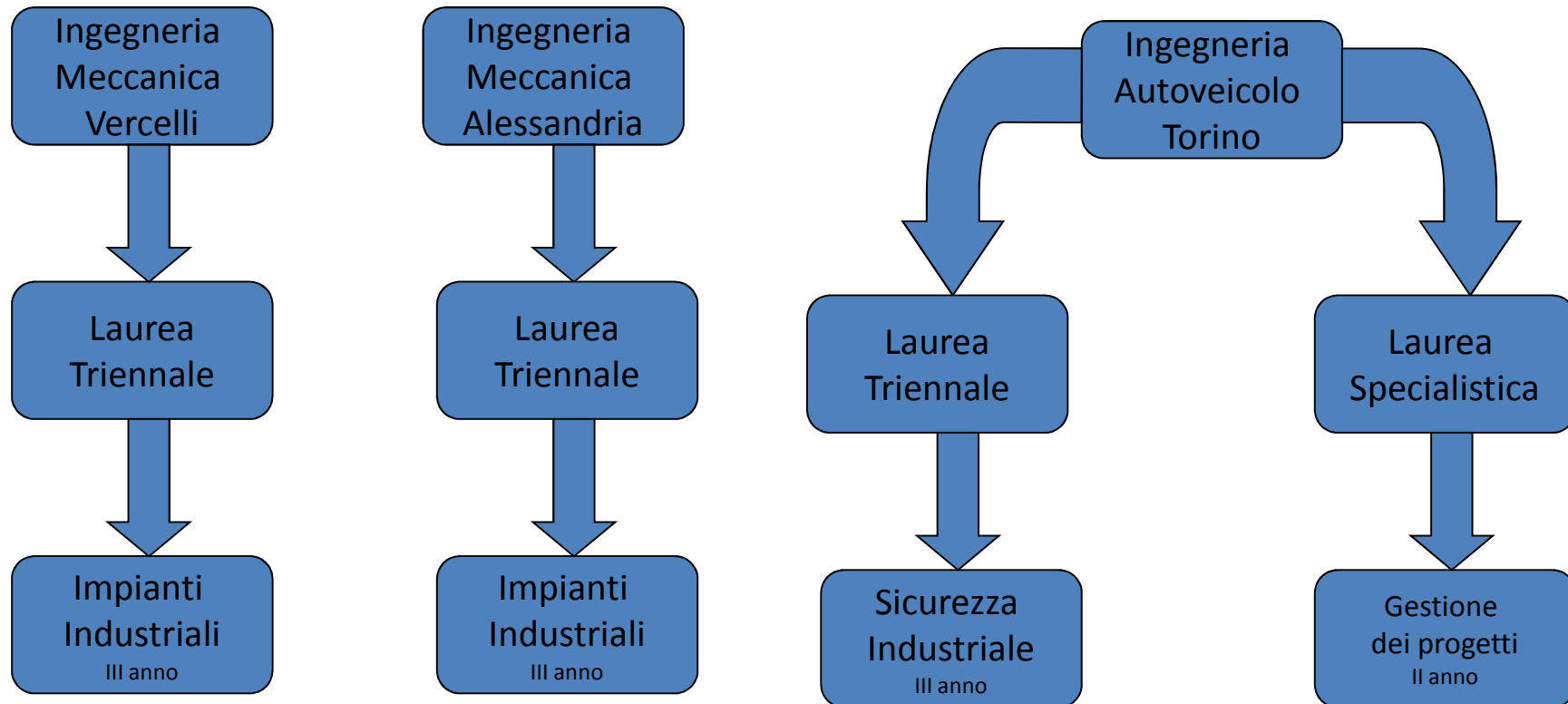
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# TEACHING ACTIVITY

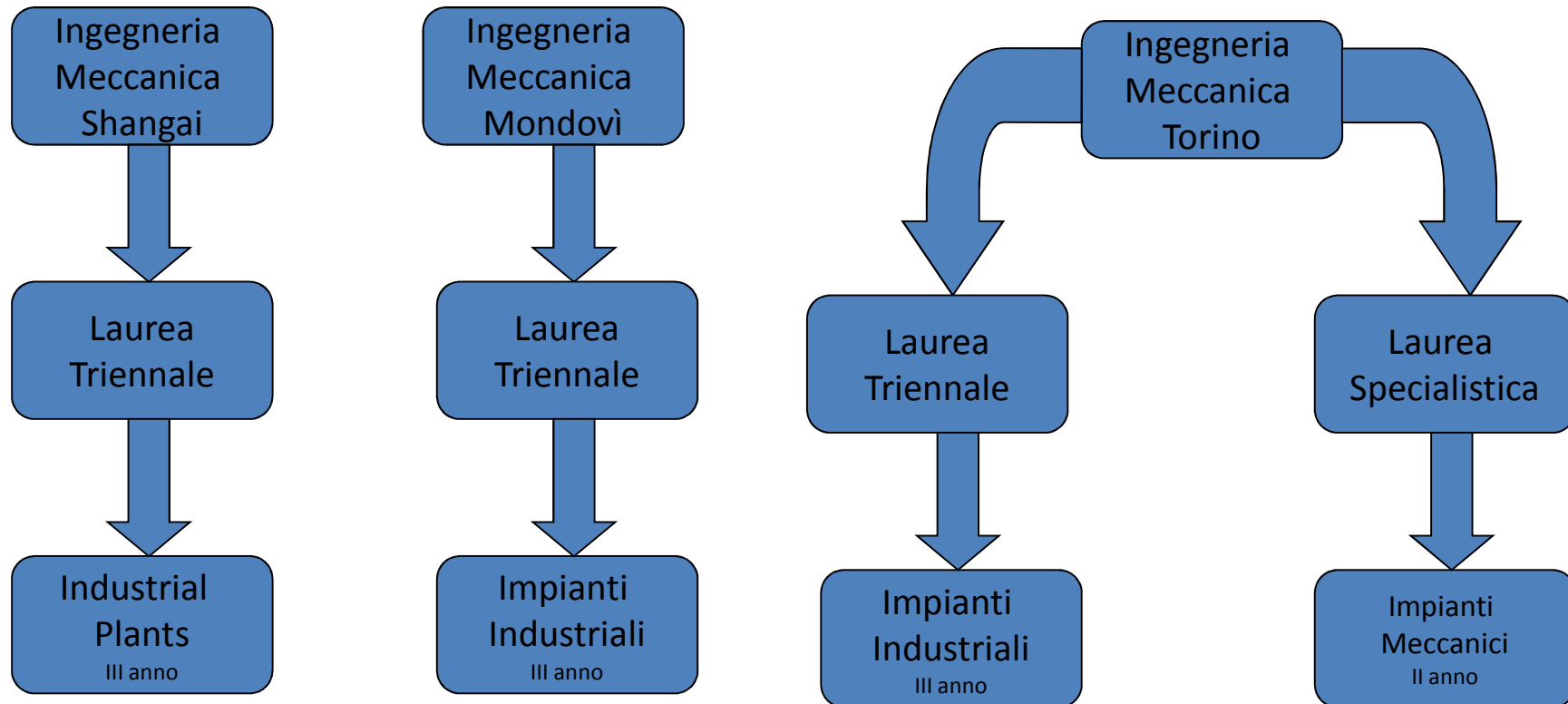


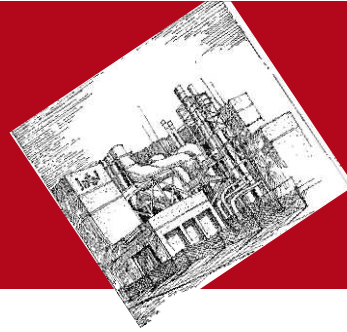
# TEACHING ACTIVITY





# TEACHING ACTIVITY





# Industrial Facilities

Studies on material and human flows within plants performed used numerical and graphical simulation to build alternative scenarios

Analysis about freight volumes in warehouses and identification of the equipment based on the inventory approach

Studied carried out on layout of distribution network, and service facilities such as fire-fighting systems and climate equipment

Analysis about the characteristics of industrial facilities in terms of efficiency and effectiveness







# Logistics and Supply Chain Management

Research and consultancy in this fields include:

- Industrial handling and storing analysis
- Logistics networks
- Performance analysis





# Project and Risk Management

Focus on facilities, engineering and constructions.

- Studies of contractual models , processes and information flows
- Tools for operational and financial planning as well as methods for costs monitoring and controlling
- Development of methods and techniques for risk identification and control
- Application of simulation based on System Dynamics supporting traditional Project Management techniques in order to estimate project performance and project choices







# Industrial Safety

Comparison of different rules and definition of checklist for specific situations, integration of roles and responsibilities

Development of models in order to give precise evaluations of the existing risks through the use of database to compare different company contexts





# Healthcare Organization



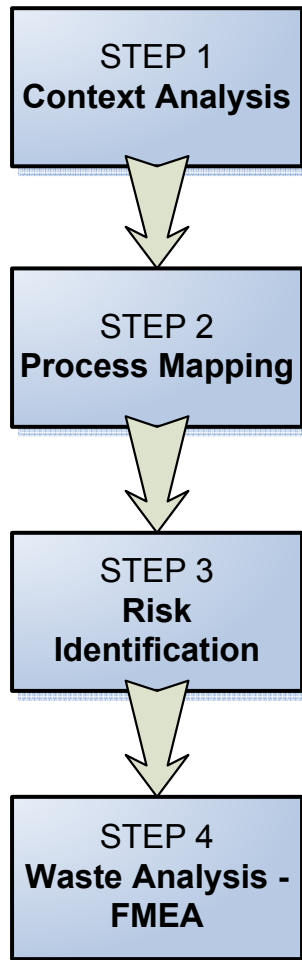
We provide methodological and technological solutions in order to increase the efficiency of the hospitals

The analysis focused on the healthcare logistics flows suggests to adopt logics applied in manufacturing

Studies are carried out on risks: approaches and methods for risk identification, assessment and management are proposed



# Healthcare Organization



Main results:  
an approach to  
manage healthcare  
supply chain risks

LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	RELEVANCE
RBS for Pharmacy Logistics Process	Internal Unit Systems	1. Organization	Operational/ Services	Planning Activities	RBS 1.1
				Phases/Work Schedule	RBS 1.2
				Workable	RBS 1.3
			Human Resources	Working Procedures Knowledge and Competences	RBS 1.4
				Education/Qualification	RBS 1.5
				Availability of Personnel in Category of Supervising Activities	RBS 1.6
				Control	RBS 1.7
				Phases/Work Schedule Knowledge and Competences	RBS 1.8
				Training for Staff of Health	RBS 1.9
				Coordinating Product Delivery	RBS 1.10
	Equipment	Optimization	Componental Parameters	RBS 1.11	
			Teleoperation	RBS 1.12	
			Stocking Problems	RBS 1.13	
			Storage Problems	RBS 1.14	
			Configuration of Service	RBS 1.15	
		Information Systems	Software	RBS 1.16	
			CRM Software	RBS 1.17	
			CRM Storage and Network Security	RBS 1.18	
			Workflow Software	RBS 1.19	
			Workflow Systems	RBS 1.20	
3. Communication	Information Challenges	Standard Software	RBS 2.1		
		Software	RBS 2.2		
		Composites and Software	RBS 2.3		
		Software Systems	RBS 2.4		
		Software	RBS 2.5		
	Communication	Information Challenges	RBS 2.6		
		Information Challenges According to Procedures	RBS 2.7		
		Verbiage in Quality	RBS 2.8		
		Verbiage in Quality	RBS 2.9		
		Verbiage in Quality	RBS 2.10		
4. Structure	Layout	Communication	RBS 3.1		
		Challenges According to Procedures	RBS 3.2		
		Verbiage in Quality	RBS 3.3		
		Verbiage in Quality	RBS 3.4		
		Verbiage in Quality	RBS 3.5		
	Communication	Communication	RBS 3.6		
		Challenges According to Procedures	RBS 3.7		
		Verbiage in Quality	RBS 3.8		
		Verbiage in Quality	RBS 3.9		
		Verbiage in Quality	RBS 3.10		
5. Product Supplying	Library	Library	RBS 4.1		
		Library	RBS 4.2		
		Library	RBS 4.3		
		Library	RBS 4.4		
		Library	RBS 4.5		
	Library	Library	RBS 4.6		
		Library	RBS 4.7		
		Library	RBS 4.8		
		Library	RBS 4.9		
		Library	RBS 4.10		
6. Product Supplying	Library	Library	RBS 5.1		
		Library	RBS 5.2		
		Library	RBS 5.3		
		Library	RBS 5.4		
		Library	RBS 5.5		
	Library	Library	RBS 5.6		
		Library	RBS 5.7		
		Library	RBS 5.8		
		Library	RBS 5.9		
		Library	RBS 5.10		
7. Environment	Library	Library	RBS 6.1		
		Library	RBS 6.2		
		Library	RBS 6.3		
		Library	RBS 6.4		
		Library	RBS 6.5		
	Library	Library	RBS 6.6		
		Library	RBS 6.7		
		Library	RBS 6.8		
		Library	RBS 6.9		
		Library	RBS 6.10		

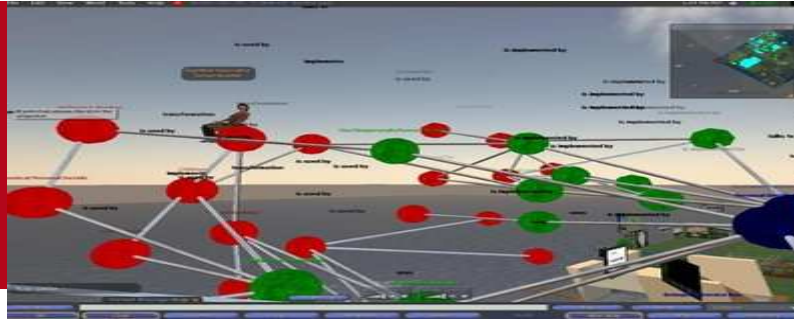
RBS for drug management processes



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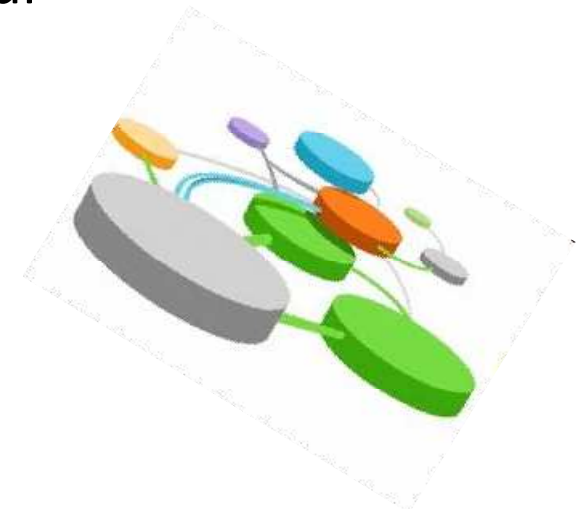
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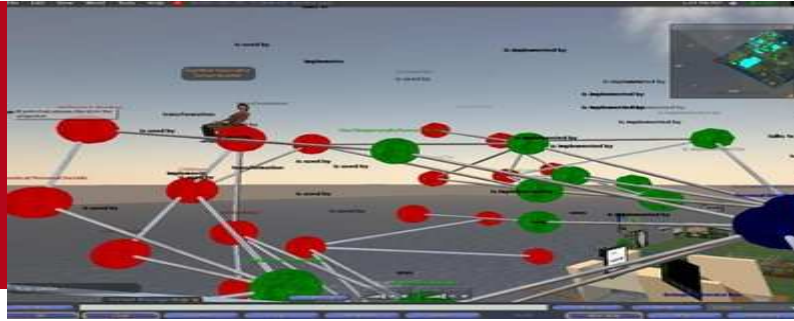


# Complex Systems

Supply chains are complex systems since they are constituted by numerous interconnected elements.

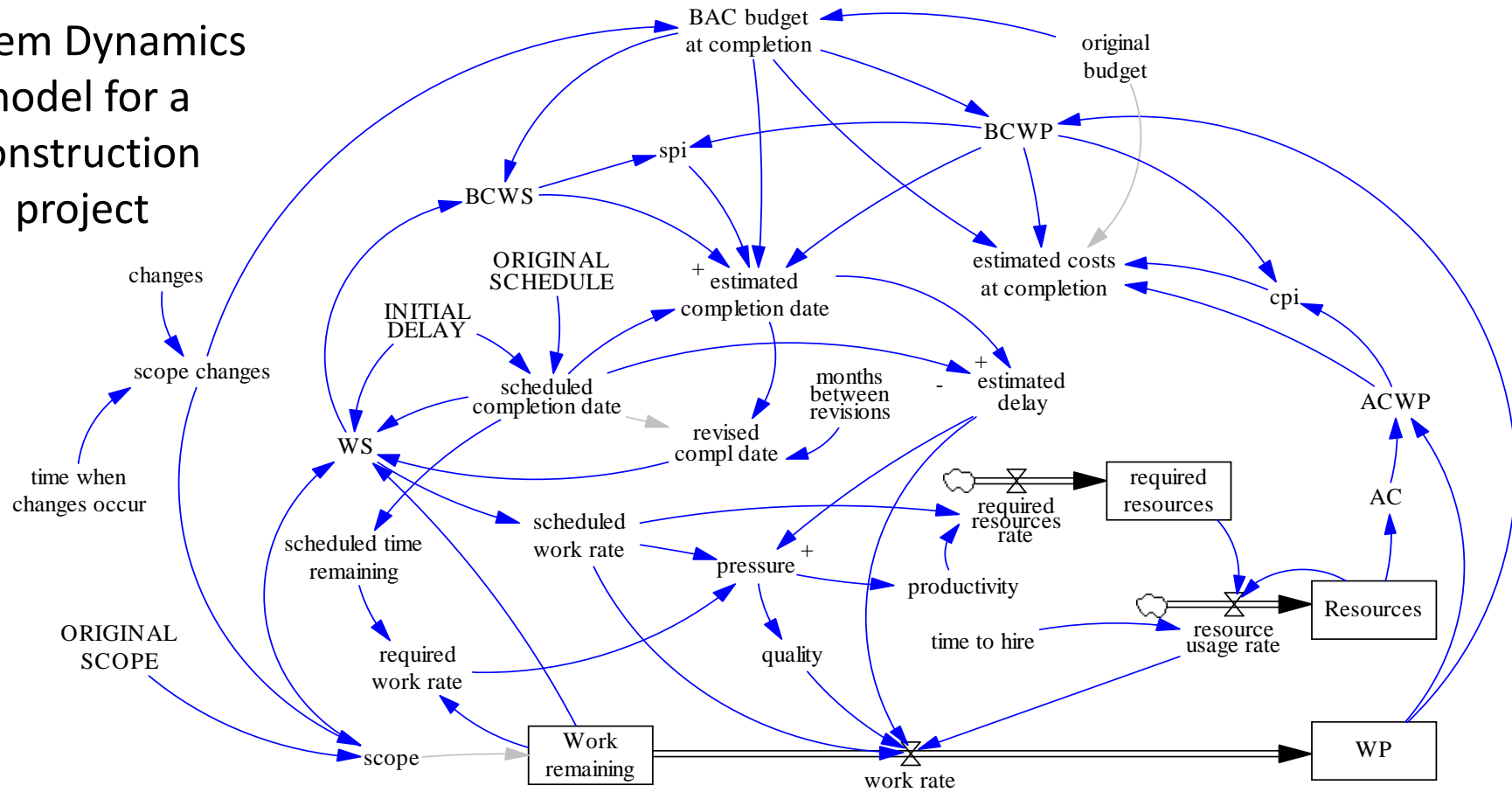
Analysis on performance measurements as a tool to capture complexity effects and integration of performance measurement with System Dynamics to identify the structure of a system and the connection among its elements determining its behaviour





# Complex Systems

## Main results: System Dynamics model for a construction project





# Top 10 publications of last five years

Authors	Title	Journal/ conference/Editor	Year-Vol-pp	Research Topic
Cagliano, Grimaldi Rafele	A systemic methodology for risk management in healthcare sector	Safety Science	2011, Vol.49, pp 695-508	5
De Marco	Project Management for facility construction	Springer DEU	2011	1
Cagliano, De Marco, Rafele, Volpe	Using System Dynamics in warehouse management: a fast fashion	Journal of Manufacturing, Technology Management	2011, Vol.2 pp. 171-188	3
Cagliano	Understanding Supply Chain Complexity . An Approach Integrating Performance Measurement and System Dynamics	VDM Verlag Dr. Muller,	2010, pp. 292	6
De Marco Briccarello Rafele	Cost and Schedule Monitoring of Industrial Building Project: Case Study	Journal of Construction Engineering and Management	2009, Vol.9 pp: 853-862	1
Schenone et al	Tools and Techniques for Supporting Reverse Logistics Optimization: Methodology, Case Study and Project Proposal	International Journal of Mathematics and Computers in Simulation	2008, Vol.8 pp. 61-78	3
Battini, Persona, Rafele	The Hospital Efficient Management: Just in Time and Kanban Tecnique	Journal of Healthcare Technology and Management	2008, Vol.9, pp 373-91	5
Grimaldi, Rafele	Current Applications of a Reference Framework for the Supply Chain Performance Measurement	International Journal of Business Performance Management	2007	2
De Marco, Rafele	System Dinamics Simulation : an Application to Regional Logistics Policy Making,	International Journal Mathematical Models in Applied Science	2007, Vol.4 pp. 253-260	2
Cantamessa, Cobos, Rafele	Il project management. Un approccio sistemico alal gestione dei progetti	De Agostini	2007	3
Grimaldi, Rafele	Current Applications of a Reference Framework for the Supply Chain Performance Measurement	International Journal of Business Performance Management	2007	2

Research Topics – Ing/Ind-17

1	2	3	4	5	6
	Logistics and				



# Research projects Industrial partners Last 4 years (2007-2011)

## Research Project 2007-2011

Project	Year	Area	Description
Pirelli	2008-2011	1	Analysis and simulation of manufacturing layout
Aress	2007-2011	5	Definition of models supporting the logistics management in the hospitals
Regione Piemonte	2006-2009	5	Re-engineering of hospital organizations
Impresa Rossi S.p.A.	2008-2009	3	Economic and financial benchmark of solar and Aeolian fields
Poste Italiane	2011	2	Analysis on inventory control, and on reverse logistics for small electronic devices
Telecom	2011	2	Telecommunications technology applications to a logistics network
Miroglio	2009-2011	2	Analysis of value created by the introduction of RFID in retail store

## Research Industrial projects: structured partners (2007-2011)

- TNT Global Express S.p.A. (San Mauro Torinese -To-)
- L'Oréal (Settimo Torinese – To-)
- General Electric (Milano)
- Martini (Pessione di Chieri - To-)
- Valeo (Santena – To-)



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