

IFIP WG 5.7

Computer-Aided Production Management

(Founded 1978)

Historic overview

Asbjørn Rolstadås
Norwegian University of Science and Technology

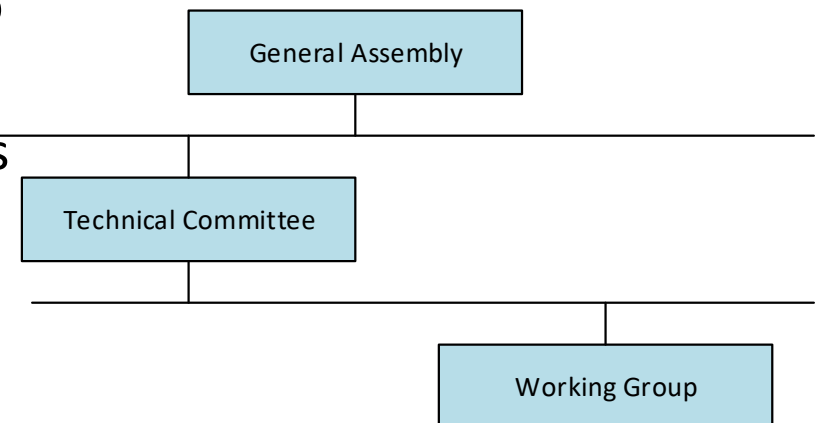


What is IFIP?

- First World Computer Congress, Paris 1959
- IFIP founded in 1960 under the auspices of UNESCO
- Isaac L. Auerbach first President
- Any national computer society may apply for membership – membership restricted to one society per country
- Activity: congress, conferences, publications
- Organization



Isaac I. Auerbach



CIRP Delphi Survey 1974



- By 1980, a computer software system for full automation and optimization of all steps in the manufacturing of a part will be developed and in wide use.
- By 1985, full automation and optimization of complete manufacturing plants, controlled by a central computer, will be a reality.
- By 1990, more than 50% of the machine tools produced, will not have a «stand-alone» use, but will be part of a versatile manufacturing system, featuring automatic part handling between stations, and being controlled from a central process computer.

Late 1970ies – CAD/CAM/CIM

- CAD
 - Product modelling
 - Bezier-curves
- CAM
 - Automation of process and operations planning
 - Numerical control of machine tools (PROLAMAT)
 - APT, EXAPT
- CIM
 - Integration concept launched by E. Merchant
- Shift in focus from design and manufacturing technology towards planning and control of operations



P. Bezier



E. Merchant

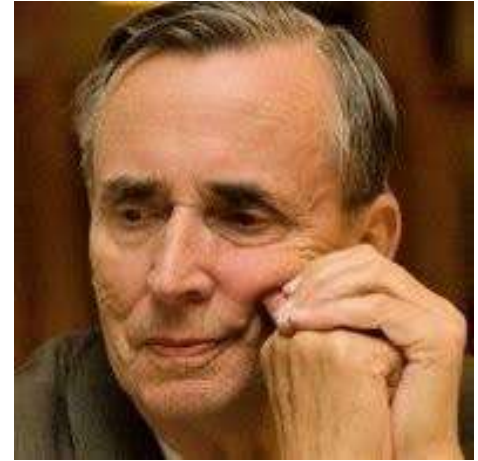
TC 5 in 1978

Computer Applications in Technology

- WG 5.1 Transportation
- WG 5.2 Computer-Aided Design (CAD) founded by Jakob Vlietstra chaired by Ernie Warman
- WG 5.3 Computer-Aided Manufacture (CAM) founded by Jozsef Hatvany chaired by Detlef Kochan
- WG 5.4 Standardized Hardware and Software Techniques
- WG 5.5 Continuous Process Industries
- WG 5.6 Maritime Industries

TC 5 meeting, Grenoble, 1978

- Chairman Jacob Vliestra
- Proposal for a new WG
- Resistance from 5.2 and 5.3
- Strong support from Jozef Hatvany
- Recommendation to GA to create WG 5.7 Computer-Aided Production Management
- Decided by GA in Oslo, 1978



Jacob Vliestra



Jozef Hatvany

WG 5.7 first meeting Copenhagen 1979



IFIP

INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING

Date : 1979-09-13

Address reply to : Associate Professor Peter
Falster
Production Engineering
Laboratory NTH-SINTEF
7034 Trondheim-NTH
Norway

MINUTES OF THE 1st MEETING IN IFIP WG 5.7, AUGUST 31, 1979

10.00 hours, ELECTRIC POWER ENGINEERING DEPARTMENT,
TECHNICAL UNIVERSITY OF DENMARK, LYNGBY, DENMARK

Attendants:	G. Doumeingts	(France)
	P. Falster	(Denmark)
	R.B. Mazumder	(Switzerland)
	E. Printz Moe	(Norway)
	A. Rolstadås, Chairman	(Norway)
	B. Svärdson	(Sweden)
	H. Wildemann	(West Germany)

1. Opening

A. Rolstadås opened the meeting as chairman and welcomed the participants. He gave a short retrospect for the establishment of the working group and expressed his sincere hope for a fruitful work in the group the coming years.

WG 5.7 Chairmen



Asbjørn Rolstadås
1978-1983



Peter Falster
1983-1989



Guy Doumeingts
1989-1995



Eero Eloranta
1995-2001



Umit Bittici
2001-2007



Marco Taisch
2007-2013



Dimitris Kiritsis
2013-2019



Gregor von Cieminski
2019 -

WG 5.7 activities

- Conferences
- IFIP state-of-the- art books
- International journal, 1989
- Joint research (FOF), 1989
- Special Interest Groups
 - Experimental and Experiential Learning in Industrial Engineering and Management
 - Product & Asset Lifecycle Management
 - Service Engineering
 - Smart Manufacturing

First APMS in Bordeaux 1982

It is a great pleasure for me and certainly for all the pioneers who participated to the first APMS in 1982, to know that the participants to APMS 2019 will celebrate this anniversary in Austin. I thank the organizers of APMS 2019 for this ceremony.

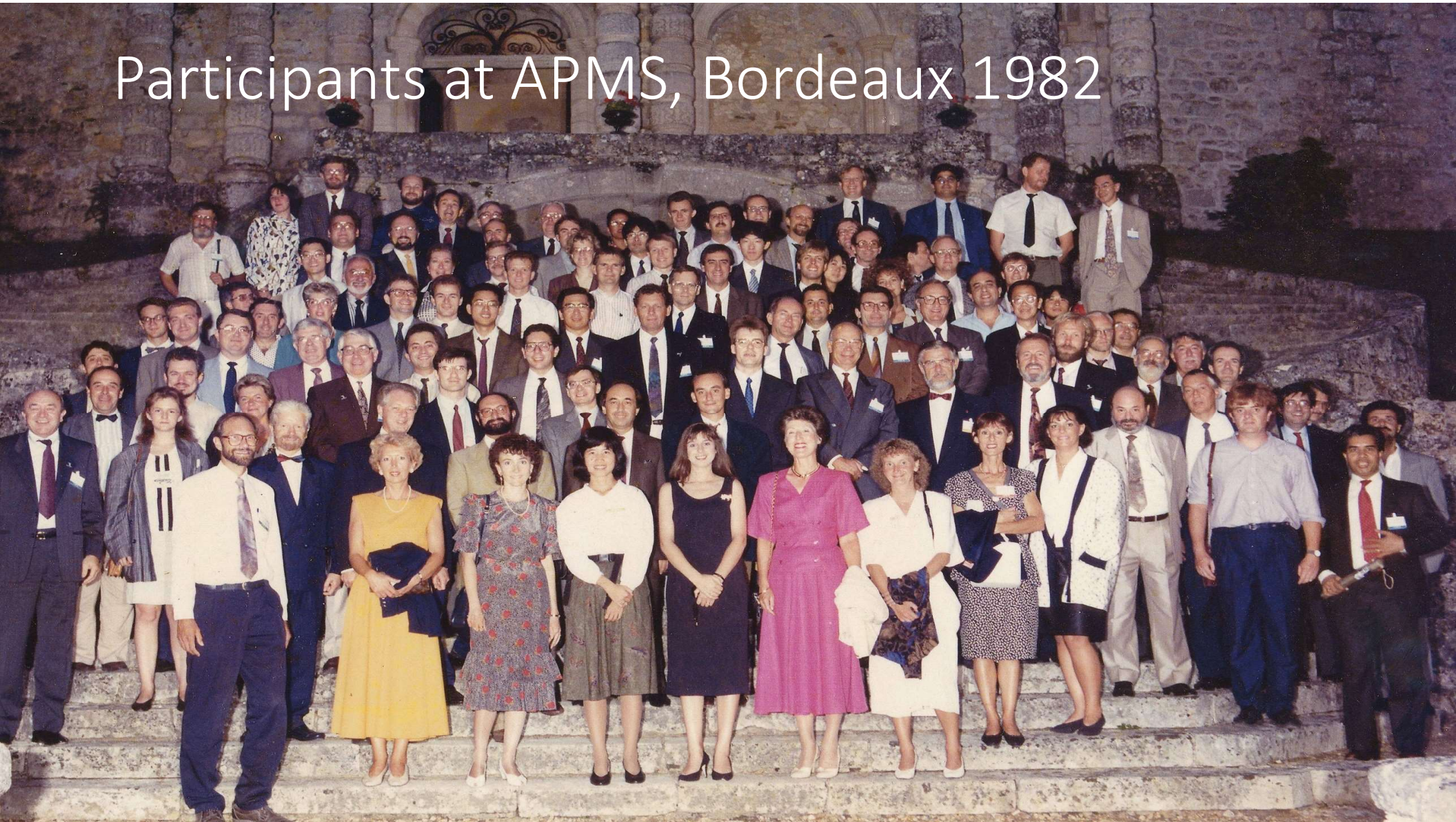
I would like to join you in such event, but unfortunately I have to contribute, for beginning of September, to the launching of the new strategy for the development of INTEROP-VLab .

I regret a lot to not be with you, but Asbjorn who has played a very important role in the creation of IFIP WG 5.7, is the right person to represent all these pioneers that you will see on the photography taken before the banquet of APMS 1982, in front of the Chateau de Vayres near Bordeaux.



Guy Doumeingts

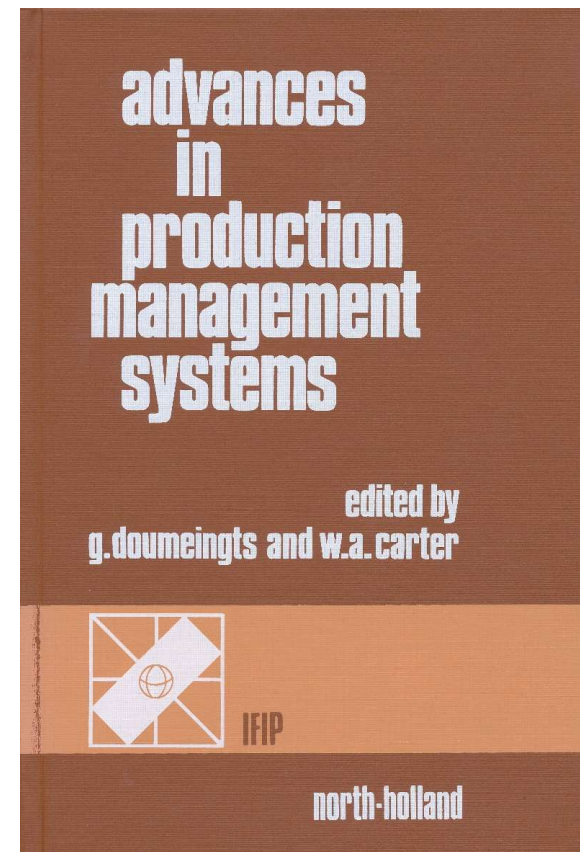
Participants at APMS, Bordeaux 1982



APMS 1982 Program Committee

INTERNATIONAL PROGRAMME COMMITTEE

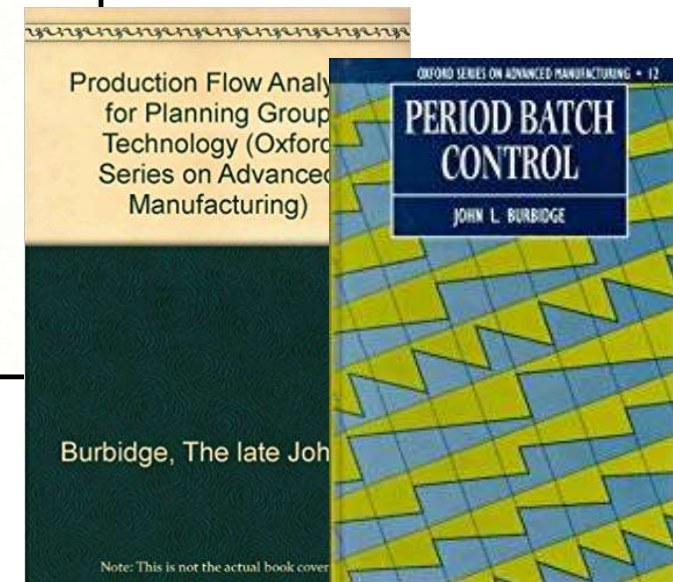
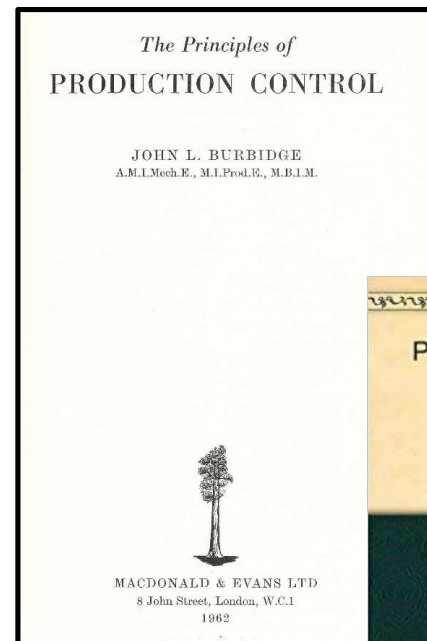
S. AUGUSTIN (Siemens A.G.) (D)
A. BUCHEL (Technische Hochschule Zürich) (CH)
W.A. CARTER (Senior Vice-President and General Manager CAM-I) (GB)
G. DOUMEINGTS (Université de Bordeaux 1) (F), Chairman of "APMS 82"
S. EILON (Imperial College of Science and Technology) (GB)
P. FALSTER (Technical University) (DK), Vice-Chairman IFIP WG 5.7
I. HAM (Pennsylvania State University) (U.S.A.)
H.C. HOFER (Hilti AG) (FL)
H. HUBNER (Institute for Advanced Studies Vienna) (A)
D. LEVY (Cisi) (F)
R.B. MAZUMDER (Brown Boveri & Cie) (CH)
E.P. MOE (Profo) (N)
M. NAPIERALA (University of Wroclaw) (PL)
N. OKINO (Hokkaido University) (J)
A. ROLSTADAS (NTH-Sintef) (N), Chairman IFIP WG 5.7
N.W. SMITH (Westinghouse Electric Corporation) (U.S.A.)
B. SVARDSON (Habberstad A/B) (S)
E. SZELKE (Hungarian Academy of Sciences) (H)
K. TAKEDA (Production Engineering Research Lab. Hitachi) (J)
P. TIMM (LK-NES) (DK)
P. URONEN (University of Oulu) (SF)
H. WILDEMAN (Indust. Betriebswirtschaftslehre zu Köln) (D)
H. YOSHIKAWA (University of Tokyo) (J)



John L. Burbidge (1914-1994)



- The Principles of Production Control 1962
- In strong opposition to MRP
- PFA and PBC
- Burbidge Award 1995
 - Author(s) of the best paper
 - Person(s) that made the best presentation.



IFIP state-of-the-art books 1988



Part I Stages of Development in Production Management

Chapter 1. Production Management Systems Asbjørn Rolstadås	3
---------------------------------------------------------------------	---

Part II Production Management Philosophies

Chapter 2. MRP/MRP II John Harhen	23
Chapter 3. Just-in-Time Production – A New Formulation and Algorithm of the Flow Shop Problem Hajime Yamashina	37
Chapter 4. The Drum-Buffer-Rope (DBR) Approach to Logistics Oded Cohen	51
Chapter 5. Period Batch Control John L. Burbidge	71
Chapter 6. All-Embracing Production Control Gideon Halevi	77

Part III Fundamental Techniques

Chapter 7. Graph Theoretical Approaches Peter Falster	97
Chapter 8. Simulation and Simulation Models Jim Browne	123
Chapter 9. Operations Research Models and Techniques Wing S. Chow, Sunderesh Heragu, and Andrew Kusiak	135
Chapter 10. Artificial Intelligence Approach to Production Planning Andrew Kusiak	149

Part IV The Computerized Production Management System

Chapter 11. Databases Johan C. Wortmann	169
Chapter 12. User Interface Eero Eloranta	181
Chapter 13. Systems Analysis Techniques Guy Doumeings	201
Chapter 14. Fourth Generation Languages Jarle Aaram	225
Chapter 15. Design of a Generalized Job Shop Control System and PM Packages Harinder Jagdev	233
Chapter 16. Validation of Job Shop Control Software – A Case Study Harinder Jagdev	253

Part V Some Important Aspects of Production Management Functions

Chapter 17. Production Scheduling John R. King	267
Chapter 18. Production Planning and Scheduling in Flexible Manufacturing Systems Kathryn E. Stecke	281
Chapter 19. Forecasting and Stock Control Birger Rapp	289
Chapter 20. Integration of PM into CIM Gideon Halevi	303

Part VI Industrial Applications

Chapter 21. Multi-Product Batch Production on a Single Machine – A Problem Revisited Samuel Eilon	319
Chapter 22. Production Control in Small Companies Kai Mertins	345
Chapter 23. Production Control in the Car Industry Wolfgang D. Thurow	355
Chapter 24. Production Control in the Aircraft Industry Bernd Hirsch and Gustav Humbert	363
Chapter 25. Job Shop Production Control Oddmund Oterhals	375
Chapter 26. Production Control in the Electromechanical Industry Siegfried Augustin	385
Chapter 27. Production Control in the Electronics Industry Ichiro Inoue	393

PPC

From the first editorial (Asbjørn Rolstadås):

Why a new journal?

This journal is intended as a forum for all PPC-related activities, from the point of view of both academic research, and industrial application and development.

From the editorial of volume 11 no. 4 (Stephen Childe):

A word from the new editor

One day in November 1999, I received an unusual e-mail enquiring as to whether I would be interested in discussing the editorship of PPC.

PPC has always had the aim of developing a greater understanding between researchers and managers in industry by publishing articles on research and industrial applications, new techniques and development trends. This shared value of practical, useful research is one of the reasons why I feel very happy to take over the editorship.



Joint projects



Project manager Hans Wortmann

Factory of the Future: Towards an integrated theory for one-of-a-kind production

- Integration of several fragmented theories about the (re)design of production systems
- The theoretical framework consists of three views: the workflow view, the resources view, and the organizational/decisional view
- The design framework consists of a connectance network of design choices (DC's), performance indicators (PI's), and relationships between DC's and PI's.

First Special Interest Group

Experimental Interactive Learning in Industrial Management

At the APMS 1993, Athens, Greece, Professor Jens Ove Riis organized a workshop and exhibition of games as part of the activities of IFIP WG 5.7. This meant the birth of the idea to form a SIG in the field.



Jens Ove Riis

- First workshop at Aalborg University, 1994
- Chairpersons:
 - 1993-1999 Professor Jens Ove Riis at Aalborg University
 - 2000-2015 Professor Riitta Smeds, Aalto University
 - 2016- Lecturer Nick Szirbik, University of Groningen

Co-Designing Serious Games

15th IFIP WG 5.7 SIG workshop, Aalto University, 2011



Some reflections

- Unlike many of the other groups, why has WG 5.7 survived?
 - Ability to renew both with respect to membership, organization and activity
 - Need for a forum for research, publication and international cooperation
- Will it still survive?
 - Climate change effect
 - Social media visibility
 - Connection to industry
- Why is it needed?
 - A guaranty for a high scientific standard
 - Future industry is dependent on the research and education in production management