A way towards Factory Competence
Tools and methods for the qualification process

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Festo – a success story

Festo was founded in 1925 in Esslingen by Gottlieb Stoll

• Founding mission
  To develop, produce and sell high-quality woodworking machinery

• 1955
  Festo is one of the first companies to recognise the potential of pneumatics and begins work on the development, production and sales of pneumatic components, thus opening up a new era

• 1965
  Development of a new division for learning materials and seminars (Festo Didactic)
Festo – an independent family company

Festo AG –
Industrial Automation and Didactic divisions
1.65 billion € turnover in 2007
Internationally in 176 countries
Innovative
2800 patents world-wide
Approx. 100 innovations each year
Research and development budget 6.5% of turnover
A learning company
12,800 staff world-wide
Training budget 1.5% of turnover
Committed to the environment and to quality
Quality and environmental certificates
(ISO 9001, VDA 6.1/6.4, ISO 14001)

Festo – a company with global operations

Festo Industrial Automation
• A leader in industrial automation with pneumatic
  and electrical drives
• Strong industrial background with numerous
  production locations world-wide
• Recognised for its corporate culture which
  promotes education, learning and knowledge

Festo Didactic
• Member of the Festo Group
• Training and consultancy for manufacturing
  Industrial companies
• Training equipment for institutes providing basic
  and vocational training
Festo – limitless and individual

- Partner for more productivity
- With 57 companies, world-wide in over 176 countries and 250 locations
- Over 1,000 sales and project engineers
- Consultancy and service
- Online shops
- Web portal with tools

The challenges of industrial production
Global market

A global network is coming into being
- Explosion in communications and data availability
- Intensive cultural exchange through travel opportunities and media
- Free trade in goods and services
- Amalgamation of companies to form global units
- Internationally operating private enterprise capital market

Global but individual competition
- Production processes are changing
- Mass customisation instead of mass production

Automated production

Automation
- From economy of scale to economy of scope
- Flexible production with highly-automated equipment
- Labour-intensive production is relocated or automated
- Boosting productivity through training and knowledge
- Training as an effective tool to boost competitiveness
The productivity challenge

Costs
Production and maintenance costs, economic efficiency and reliability

Quality
Product and service quality

Time
Delivery times, throughput times, flexibility with product and quantity changes

- Costs, quality and time are the factors governing genuine productivity increase.
- Training is the key to successful automation.

The market is changing for Festo as well

Slower growth rates (market potential)

Larger product range (catalogue products)

Fewer orders on hand

Smaller orders (order value)

* Regional Service
Global production network of Festo

Festo Value Production
Continuous improvement and cost reduction
- FVP Targets
- Principles, Methods and Tools
- FVP Organisation
- FVP Core Team
- Value Production Coaches
- Best Practice Solutions
- Knowledge Network FVP
- Fit for FVP Qualification Program
- FVP Roll Out 2008
**Festo Value Production**

A production system describes the methods to use in production and the standards on which these are based.

**Global:**
In our world-wide production- and logistics network we can make allowance for regional requirements and offer our customers extremely short delivery times.

**Sustainable:**
With a continuous improvement process, we create standards and continuously develop these further. In this way, we are able to design today’s processes for the products of tomorrow.

**Holistic:**
“The whole is greater than the sum of its parts.” FVP places its methods in a meaningful context in order to optimise our value-creation chain.

**Targets**

- By the use of a production standard for all GPCs, RSCs and NSCs we can globally achieve a high process efficiency and uniform product quality. This standard is defined as the “Festo Value Production” FVP.
- Continuous improvement of our production processes regarding quality, costs and time
- Best of class in market supply for highest customer satisfaction
- Motivation of our employees to reach a world class production
- Comparability and transfer of production sequences within the global network
- Stay ahead of competition at a global level

**Quality**

**Costs** ↔ **Time**
Methods & Tools

Example:

- Changeover from individual workplace assembly to one-piece-flow
- Introduction of Kanban and supermarket
- Best point material handling
- Reduction of set-up time

before: several individual workplaces
after: continuous one-piece flow

Fit for FVP training program

e.g. workshop: value stream mapping
As the level of automation increases, the demand for training rises further

Rising demand for qualified staff

Development into industrial sector

Strategies to improve competitive position of German machine constructors

Push product innovation 4,4
Qualification of employees 4,4
Increased entrance of foreign markets 4,2
More customer specific solutions 3,9
Cost reduction by organizational measures 3,9
Extension of range of services offered 3,9
Focus on core competencies 3,8
Increased standardisation of production 3,8
Aggressive marketing 3,8
More standard products 3,6
Increased procurement in low-wage countries 3,6
Cooperation 3,3
Decrease of vertical integration 3,1
Investment in plant and machinery 3,1
Outsourcing to foreign countries 2,8

Number of points 1 unimportant 2 3 4 5 very important

Source: VDMA survey 2004
Training in order to safeguard competitiveness

Factors:

1. Demographic change
2. Life-long learning
3. Knowledge as a competitive factor
4. The key to success: Learning transfer
Factor 1 – Demographic change

- Demographic change (in certain regions) is leading to new demands for staff training.

Demographic development at Festo AG & Co. KG 2005-2015

Factor 2 – Life-long learning

- Business processes must support life-long learning, or in other words in-service learning as an accompaniment to work.
- 2-phase biographies are a thing of the past.
Factor 2 – Life-long learning

The competence areas that count today are as follows:
• Capacity for autonomous action
• Learning how to learn
• Problem-solving
• Cooperation/teamwork
• Communication
• Accepting/assuming responsibility

Factor 3

Knowledge is becoming competitive factor #1
Factor 3 – Increasing productivity through ...  

- Mechanisation
- Industrial automation
- Training and knowledge

Agrarian society (tradition, land)
Industrial society (performance, machines)
Knowledge society, values, knowledge, skills

Factor 3 – The demand for knowledge is increasing

More available knowledge
More knowledge in products
Demand for trained staff

Book printing
Physical production
Intensively trained

Internet
80%
Less trained

2003
2004
2005

2003
2004
2005
Factor 4

Boosting learning transfer efficiency is the key to the training process.

Factor 4 – In-service learning (learn and work)

Maximum learning success at competitive cost

Efficiency = Learning success

Investment (time + money)

+ Large practical component

= Optimum preparation for excellent performance in everyday professional life through blended learning concepts.
Factor 4 – The right mix of methods for blended learning

- Student-controlled learning
  - CBTs/WBTs
  - E-learning
  - Distance learning courses

- Instructor-based learning
  - Classroom courses

Blended learning
  - Learning labs/practical exercises

The things that really count ...

- Technology and innovation are the twin foundations of our industrial future
- It is only through innovation that we can create new products, customers and markets
- Innovation starts in our heads – This means with training
- Knowledge and training – our most important resources if we are to further enhance our position of technological leadership
Training: Festo’s offer towards Factory Competence

- More than 100,000 training days per year in more than 2,900 seminars
- Qualified Festo trainers offer modular and quality assured training content in more than 30 languages

People:
Problem solving techniques, moderation of teams, efficient communication, intercultural competence

Technology:
Pneumatics, hydraulics, control systems, PLC/SPC technology, robotics, sensors

Organisation:
Process optimisation, Kanban, Set up time reduction, Value stream analysis, Lean Design

Industrial Consulting: Helping Industry to higher Productivity

- More than 230 consulting projects with 150 customers
- Know-how and experience with the Festo production system

Lean Production:
Introduction of a new production system, value stream analysis, set-up offensive, segmentation, bottleneck-oriented production control

Purchasing and logistic:
Storage and delivery strategy, supplier assessment and development, make or buy, purchasing strategy and organisation

Sustainable improvement culture:
Reduction of wastes, problem solving techniques, management and employee CIP, anchorage of the new innovative approaches within the company
The things that really count ...

### Consulting References

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<td>LEHRUNGER &amp; KOFERS</td>
<td>Management development for general business</td>
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<td>GKN PRINT METALS</td>
<td>Introduction of a professional training system</td>
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<td>MAGNA STEYR</td>
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<td>Qualification of internal consultants</td>
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The things that really count ...

### Learning Systems for Training in Factory Automation and Mechatronics

- Actuators and sensors
- System modelling
- Signals and systems
- Software and data management
- Computer, networks and logic systems

Integrated approach
The things that really count ...

Knowledge segments in industrial automation

Our aim: To boost our customers’ learning success

our basic principles
Basic principle 1 – Better understanding

From the whole to a part
Job driven learning – Motivation & stimulation

1. Production line  2. Modules  3. Technologies

Basic principle 1 – Learning factory solutions
Basic principle 1 – Learning Factory Solutions

Organisation

Technology

Human beings

Training
- Technical competence
- Personal competence
- Social competence

Basic principle 1 – Success models

MPS®/MPS® 500
- Based on MPS®
- Flexible materials flow

MPS® /microFMS
- Introduction to FMS
- Robotics
- CNC integration

ICIM
- Learning factory
- Production management

Process & Hybrid Automation
- MPS PA
- Compact Workstation
- AFB solutions
**Basic principle 1 – Technologies in industrial automation**

- Actuators
- Networks
- Sensors
- Automation pentagon
- Processors
- Software

**Basic principle 2 – Action-oriented learning with industrial components**
Basic principle 3 – The right media mix is important

- Textbooks
- Trainers
- Self-initiated
- CBT/WBT
- Video, DVD
- Simulation software
- Workshops
- Exercises
- Practical tasks

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Basic principle 4 – The web will permanently change the world of learning

- 24 hours a day
- Available anywhere
- Any time
- Covers all subjects
- Cooperative principle
- PC-based
- E-learning
- Corporate universities
Basic principle 5 – Simulation ...

Circuit generation and simulation with FluidSim®

... plus practice:

Combined real and virtual learning factories
Basic principle 6 – Communication and teamwork

Basic principle 7 – Just in time instead of just in case

- Student-controlled learning
- Flexible
- Learning round the clock
- Rapid adaptation to changing needs
Basic principle 8 – Matched to the required training level

- Plant manager
- Technician
- Engineer

- Basic training
- Vocational training
- Technical universities

Training systems support the following competence areas:

- Capacity for autonomous action
- Learning how to learn
- Problem-solving
- Cooperation/teamwork
- Communication
- Accepting/bearing responsibility
... with the aim:

to understand the real world of industrial automation

... and reach the professional Factory Competence!

Many thanks for your attention!

www.festo-didactic.com