Career Development to be a Multi-National and Multi-Disciplinary Engineer

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Contents

A. General Introduction

1 General Introduction

➢ **Training: (1971-2005)**
- **Ph.D. on Metal Forming (Germany), Dissertation as a book**
- **Software Engineer (30 classes: B.S. M.S. Certification, 10 each)**
- **4 languages (3+1), 3 countries' experience**
- **Work: Mechanical, Metallurgical, Electronic**

➢ **Life & Progress**
- **Three turning points: College, Germany/Ph.D., US/Training**
- **Factors for Progress: Luck, Strategy, Self-Training**
- **Luck: Wrong decisions for all three crossroads; forced to the right track**

A. General Introduction

2 Current Development Focus

- ➤ **Consulting, Web-based Services**

- ➤ **Level 2 Model for Rolling Process**
  - ▪ **Rolling process models + Draft schedule**

- ➤ **Level 3 Model**
  - ▪ **Production scheduling & Related models**

- ➤ **Roll Pass Software**
  - ▪ **Flat, Wire Rod, Bar & Section**

B. Self-Training Methodology

1 Strategy

➢ **Decide what to focus on and what to put aside**
   ▪ **Successful example: got scholarship to study in Germany**
   ▪ **Focused on core classes and English; put aside computer classes**

➢ **Plan 3 to 5 years ahead**
   ▪ **Example: came to USA by keeping spoken English**

➢ **Turn what needed to do into the hobby**
   ▪ **The most important part of all**
   ▪ **Three stages in Interest: Fresh, Boring, Interesting**
   ▪ **Three stages of progress: Fast, slow, fast**

B. Self-Training Methodology

2 Method

> **Example 1: Foreign language**
> - Use cards to memorize 500 words a day
> - Read paragraphs with 10-20 new words each
> - Me: Collected credits from classes of English major

> **Example 2: Computer**
> - Was my weakness
> - Tight combination of the real projects and class attendance
> - Run hundreds to thousands of examples (downloaded online)
> - May Use cards to strengthen syntaxes

C. Career Training Examples

1 Classes I Completed for Engineering

> ➢ **Mechanical Engineering (396 hours)**
>
> ➢ **Metallurgical and Materials Engineering (372 hours)**
>
> ➢ **Electrical Engineering & Electrics (135 hours)**
>
> ➢ **Metal Forming Fundamentals (347 hours)**
>
> ➢ **Rolling Mill Technology (314 hours)**

C. Career Training Examples

3 Training Completed for Software Engineering

> **Five years in a German Computer Lab**
> - Ph.D. study on computer simulation of steel section rolling

> **C/C++/MFC/VB Classes + Roll Pass Software Development**
> - Motive: Roll pass software by using my rolling process models
> - Time: 1998-1999 (after completion of my rolling process models)

> **Three years as Level 2 Software Engineer + Evening Classes**
> - Developed EAF Level 2, LMF Level 2 and Caster Level 2
> - Trainings on Oracle, MCSE, Network, Shop computer HW & SW …

> **Ms .Net Certification Trainings + Development of metalpass.com**
> - All classes for: MCAD for Windows Application
> - All classes for: MCAD for Web Application
> - All classes for: MCDBA (Microsoft Certified Database Administrator)

D. Work Result Examples

1 Steel Rolling Empirical Models I Established

Totally over 100 models:

➢ **Metal Flow**

➢ **Force, Torque, Power**

➢ **Roll, Stand, Mill**

➢ **Temperature, Heat Transfer**

➢ **Microstructure, Finish Properties**

D. Work Result Examples

2 Steel Rolling Numerical Models I Established

> **FEM Model**
> - **FEM: Finite Element Method**
> - **Models for Flat rolling, Angle steel rolling, I-Beam Rolling, etc.**
> - **Model for Wire rod rolling, for deformation and microstructure**

> **FDM Model**
> - **FDM: Finite Differential Method**
> - **Determined temperature profile over the rolling, water cooling, air cooling**
> - **Web-based program in www.metalpass.com/cool**

D. Work Result Examples

3 108 Mill Related Projects

➢ **Mill Level 2**	▪ **Development (17)** ▪ **Support (5)**
➢ **Mill Development**	▪ **Application (14)** ▪ **Rolling and Roll Pass (9)**
➢ **Process Modeling**	▪ **Numerical (9)** ▪ **Empirical (28)**
➢ **Mill Improvement**	▪ **Mechanical Properties (4)** ▪ **Productivity (4)** ▪ **Shape and Yield (4)**
➢ **Web & Resource**	▪ **Web & Resource (14)**

Available in metalpass.com/consulting (18-page doc. per request)

D. Work Result Examples

4 Collected Resources in metalpass.com

➢ **About 40,000 pages**

➢ **Web-based Software**
  - ▪ **Nearly 20 web-based programs**

➢ **Largest Databases in Metal/Steel Industry**
  - ▪ **Material data: flow stress models (2000), high-temp. properties, …**
  - ▪ **Metal Directory (50,000), Metal Patents, Software database (2000), …**
  - ▪ **Metal Dictionaries: Tech terms (11,000), Translation (4,500 in 5 lang.)**

➢ **Technical articles**
  - ▪ **About 30 categories and dozens articles each**

D. Work Result Examples

5 Development on Next-Generation Level 2 System

> ➢ **Metallurgical + Mechanical/Thermal**
>   - ▪ **Full metallurgical models + today's mechanical/thermal models**
>
> ➢ **Intelligent Learning with Hybrid Solution**
>   - ▪ **Empirical models + Neural network + Expert system as guideline**
>
> ➢ **Advanced Software Engineering**
>   - ▪ **Uninterrupted upgrade, Object-oriented design, SOA**

Thank You

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