Advanced Product Quality Planning (APQP)

Automotive & Semi-conductor products

Cooperation results

Customer & supplier

Guenter Pilch
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Overview

- Presentation – Outline
  - STMicroelectronics – short company profile
  - APQP - Principles
    (APQP = Advanced Product Quality Planning)
  - Quality vs. Business vs. Communication
  - Business model & Liability
  - Tool positioning
  - Example, screen shot
  - Business model
  - Tool performance
  - Questions & Answers
Some key data *(basis: year 2007)*...

- #5 of semi-conductor companies, 10 Billion US$ Revenue
- Broad range supplier

**STMicroelectronics – Short company profile**

- **#5 of semiconductor companies**, 10 Billion US$ Revenue
- **Broad range supplier**

**STMicroelectronics**

- a global semiconductor company
- Sales by region % of 2007 sales:
  - 12% North America
  - 32% Europe
  - 27% Greater China**
  - 5% Japan
  - 18% Asia Pacific
  - 6% Emerging Markets*

- 2007 Sales: US$ 10 billion
- 2006 Sales: US$ 9.85 billion
- Approximately 50,000 employees
- 15 main production sites
- 16 advanced R&D centers
- 39 design and application centers
- 78 direct sales offices in 36 countries

**Complete product solutions for high growth applications**

**Priority segments**

- **Communications**
- **Computer peripherals**
- **Digital consumer**
- **Automotive**
- **Industrial & Multisegment**

**Focus applications**

- **Wireless**
  - Connectivity
  - Mobile phone
  - Portable multimedia
  - Imaging
- **Networking**
- **Data storage**
- **High Definition DVD**
- **Digital & HD TV**
- **Car multimedia**
- **Powertrain**
- **Safety**
- **Car body**
- **Lighting**
- **Metering**
- **SmartCards**

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*India, Brazil, Africa, Latin America, Middle East
**China, Taiwan, Hong Kong

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STMicroelectronics – Short company profile

Additional highlights
- High focus on Automotive (15% of revenues)
- Several certifications (ISO/TS16949, ISO14001, ...)
- Different awards, Quality, Environment, ...

STMicroelectronics Awards

ST has received more than 100 awards and accolades worldwide, in the areas of both Quality and Environmental Protection, including the European Quality Award and the Malcolm Baldrige National Quality Award

Balanced sales in the major market segments

Source: ST
Some personal Information

❖ 2 min. introduction about myself...
   to explain also the focus of evaluation which is shown afterwards

❖ Since 12 years at ST - Automotive Business Unit / Division

❖ Different positions in
  ❖ Technical Sales & Marketing
  ❖ Project management, Foundry, ASICs, Micro-controller with eFlash
  ❖ *(Customer oriented)* Program management, Quality *(PPAP, APQP, …)*

❖ Actually
  ❖ Customer Requirements Management *(Contracts, Agreements, …)*
  ❖ Project management, micro-controller cooperation
    between ST and another well known semi-conductor company

❖ Internal certified trainer for different courses regarding
   project management and product development
AIAG (Automotive Industry Action Group) – “Standards”

Common result

- We need fine tuning for semiconductors (“standard” comes originally from a “mechanical world”)
- We need different „APQP levels“ for ASSPs & ASICs or uC with eFlash (added value vs. follow-up = costs)
- Final result from APQP has to be also the major input for PPAP (Production Part Approval Process)
Business model & Liability

Common understanding...

- Long term business relationship is the target of both companies
  *(basic business rule for Automotive....)*
- Customer & Supplier have to work together to have success
  *(ASICs, high temperature application, safety, ...)*
- Data will be entered basing on „best known“ status
- No legal liability paragraphs or direct data to control production
  *(innovation and good communication & spirit has high priority)*
- Early warnings is in place
  *(regular project team and management reviews)*
Who is involved...?

Common result:

- added value for both companies  
  \(\text{project confidence vs. work effort = costs}\)

- Risk evaluation matrix needs to be reasonable  
  \(\text{electronics vs. mechanics}\)

- Risks have to be understandable and must be expressed clearly  
  \(\text{design vs. marketing vs. ...}\)

- Constructive interaction & communication  
  \(\text{more then just pure “checklist” follow-up}\)

- Outputs needs integration in the review process
Tool positioning

Tool positioning vs. Development process

„Supply-chain of information“ for Quality & project management vs. internal processes

Tool positioning vs. development process & other tools

<table>
<thead>
<tr>
<th>Immaturity Level</th>
<th>New Product Request</th>
<th>Design Approval Certificate</th>
<th>Product Quality Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST SALES &amp; CUSTOMER RELATIONSHIP KEY PROCESS</td>
<td>ST PRODUCT DEVELOPMENT KEY PROCESS</td>
<td>ST SALES &amp; CUSTOMER RELATIONSHIP KEY PROCESS</td>
<td></td>
</tr>
<tr>
<td>SupplyOn APQP SW Module</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Tool – Supplier view – Screen shot

Structured data
Indicators (GYR)
Same basis for discussion Customer/Supplier
Business model

Business model – Proposal for improvement

Semi-conductor related key items
Evaluation matrix defined by customer can still be improved

Future trends
AIAG gives some good guidelines, but we need more! (SW, application)

Safe launch
there are more then just technical risks...

Introduce more link of APQP vs. PPAP in internal working procedures (development – production release)

Data storage
15 years data storage

There was and is a very constructive spirit between our customer and ST to discuss very openly results and needs from both side! Thank you for that!
**Tool performance**

- **Tool evaluation – Positive items**
  - secure
  - fast & user friendly tool
  - clear status overview
  - supports interaction between Customer & supplier

![Business Model - Customer & SupplyOn's Tool performance](image)
Tool performance

- Tool – some proposals for the future
  - Project management
    introduction of action follow-up
  - Risk management
    should include a weighting of items
    *(can also be a „generic“ Project FMEA)*
  - Data export
    very limited for supplier
    *(download of a snapshot)*
  - Data storage/format
    how to ensure data access in some years?

We are confident that with a fair effort (=costs) also these items can be improved to provide a suitable and state-of-the-art solution.

**Attention: We have to consider the Tool & Business model together**