Is MT in Crisis?
Panel Session at TMI 2007

• Panelists:
  – Robert Moore (Microsoft Research)
  – Robert Frederking (CMU)
  – Dekai Wu (Hong Kong Univ of Science and Technology)
  – Harold Somers (Manchester University)

• Moderator:
  – Steven Krauwer (Utrecht University, steven.krauwer@let.uu.nl)
The Impact of DOTD on Aviation

Steven Krauwer

Utrecht University

steven.krauwer@let.uu.nl
Overview

• The problem
• Some known contributing factors
• The discovery
• The proposal
• The take-up
• The impact
• The results
• The future
The problem

• Around 1900:
  – First powered aircraft
  – Flying highly experimental

• Success and progress hard to measure because of interplay between many known and unknown factors and lack of standards for measurement
Some known contributing factors

- wind
- thermals
- difference between start and finish altitude
- start speed
- flight duration
- distance covered
- altitude reached
- number of passengers transported
The discovery

- Papilloni (1902) first observed a strong negative correlation between what experts saw as successful flights and the noise made upon touchdown.
- Noise could originate from various sources (gliding, rolling, exploding, crashing, victims) but the correlation was very strong.
The proposal

• Papilloni proposed the following approach:
  – high precision equipment is used to measure the noise made by the plane upon touchdown
  – the measure unit is Decibel upOn TouchDown (DOTD)
  – a lower score indicates better performance
The take-up

• Immediate interest from whole aviation community
• Soon formally adopted by NISA (National Institute for Successful Aviation) with some refinements
• Used as the driving force for aviation R&D funding
The impact

- DOTD became an enabler for competitive R&D in aircraft development
- it led to adoption of standards for noise measuring
- it led to standards for determining the moment of touchdown
- it led to improved measuring techniques, such as:
  - more precision (at present up to 45 decimals)
  - cancellation filters for wind and engine sounds
  - cancellation filters for birds and spectator noise
The results after a century, in 2007

- new generation of advanced, successful airplanes
- features (based on latest campaign)
  - air speed up to 15 km/h
  - domination of electric or spring engines
  - max altitudes 0.2 – 0.5 meter
  - max distances covered 0.5 – 25(!) meter
  - soft, flexible materials (fur very popular in spite of animal activists)
  - touchdown almost inaudible to the human ear, even when on fire
  - pre-flight scream prevention training for passengers
  - advanced anti-scream masks for passengers
The future (till 2017)

• challenges
  – higher altitudes (up to 3 meter)
  – distances up to 100 meter
  – untrained passengers

• expectations
  – with the present funding level this should be possible within 10 years
  – earlier with more funding!
Structure of the session

10-30: Panelists introduce themselves and tell us whether or not MT is in crisis
30-35: Open floor discussion
35-55: Panelists describe last two big achievements in MT
55-60: Open floor discussion
65-80: Panelists predict next breakthrough
80-85: Open floor discussion
85-90: Closing