

### How To Successfully Renovate A Controls System?

Lessons Learned From The Renovation of The CERN Injectors' Controls Software

**Grzegorz Kruk** on behalf of the InCA team CERN, Beams Department, Controls Group



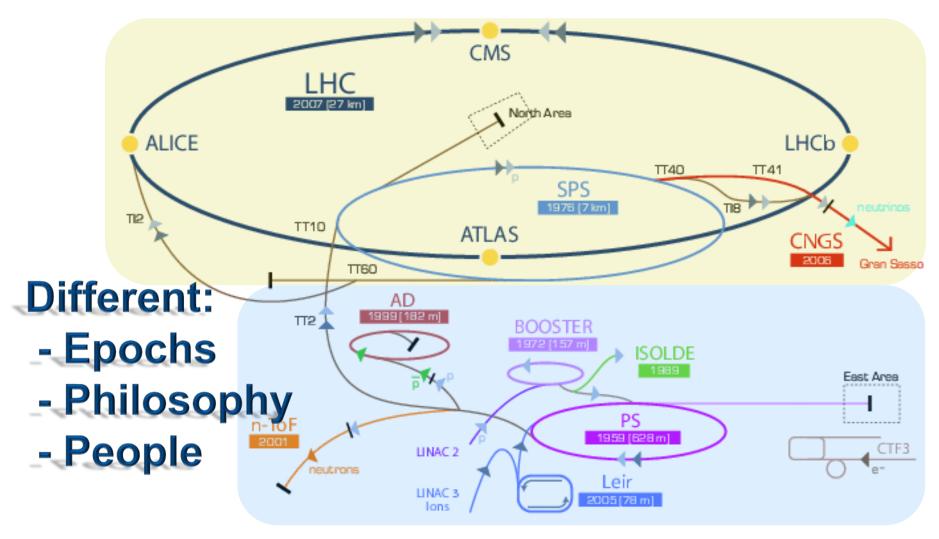






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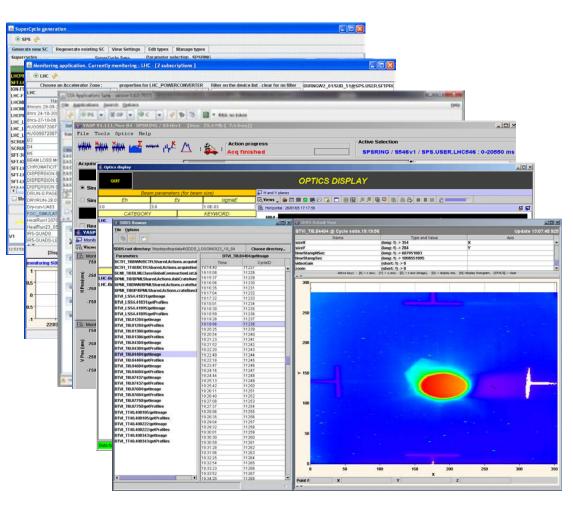
### **Different Worlds**





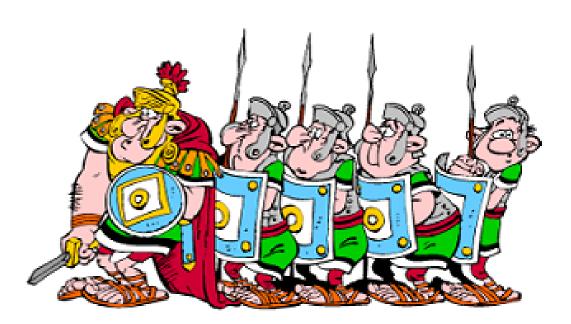
### LHC Software Architecture

- Development shared between
   Controls and
   Operations
- All functionality
  needed to control
  SPS and LHC





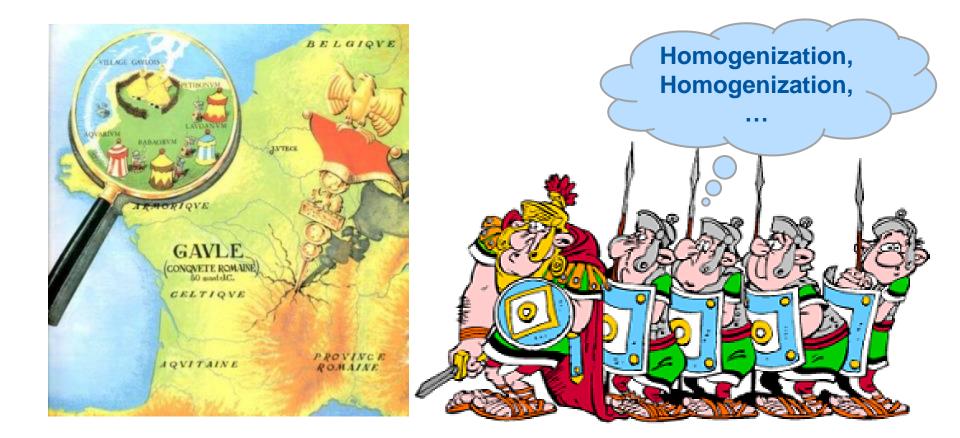








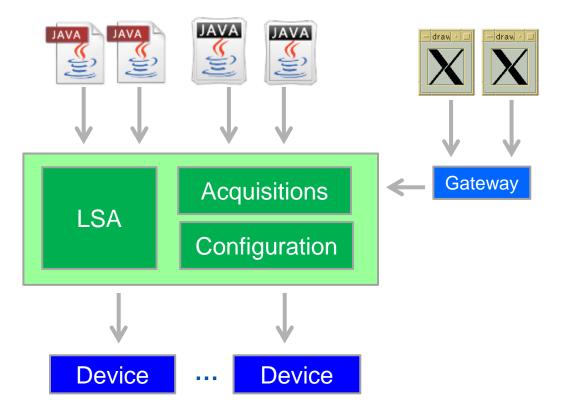






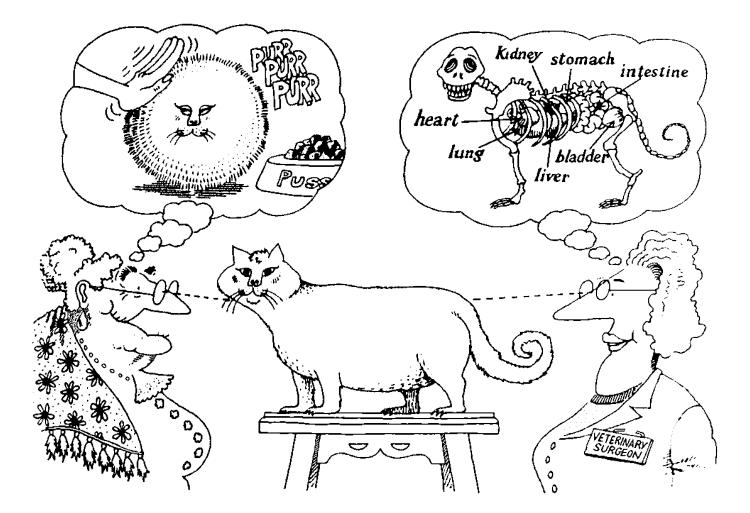
#### We thought it's just technical...

- ? Integration
- ? Configuration
- ? Performance
- ? Scalability
- ? ...





#### But users have a bit different view...





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1960s → Hardware



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1960s → Hardware



1980s → X/Motif









1960s → Hardware

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1980s → X/Motif



 $2000s \rightarrow Java$ 







1960s → Hardware

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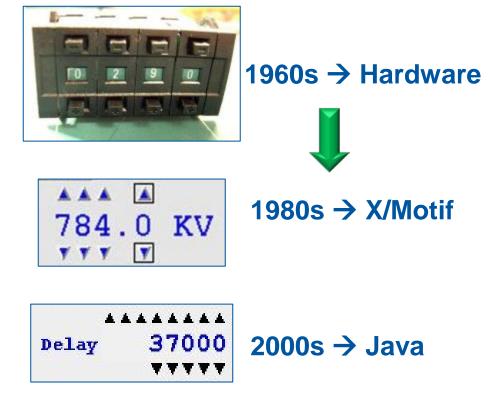
 $2000s \rightarrow Java$ 

"We didn't ask for this, we want it as it was before!"



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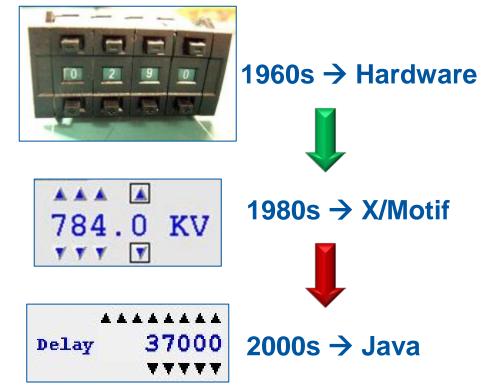




"We didn't ask for this, we want it as it was before!"







"We didn't ask for this, we want it as it was before!"







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### But why?

- Not just habits → accelerators are different, really
  - Fast vs. slow, model, impact, ...
- The renovation was in Controls' interest, not really in Operations'
- Insufficient commitment



### But why?

- Not just habits → accelerators are different, really
  - Fast vs. slow, model, impact, ...
- The renovation was in Controls' interest, not really in Operations'
- Insufficient commitment

### We focused on technical problems and underestimated human aspects.



#### **Involvement and Commitment**



### **Involvement and Commitment**



By Clark & Vizdos

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### How did we address it?

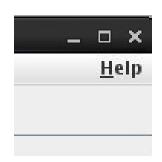
- Increase mutual understanding
  - Spend time in the control room
  - Observe, Listen, Discuss
  - Help resolving problems
  - Engage Operations in the development and testing
  - Promote the **new ideas** while **respecting** their **habits** 
    - Go for compromises
- Iterative Improvement





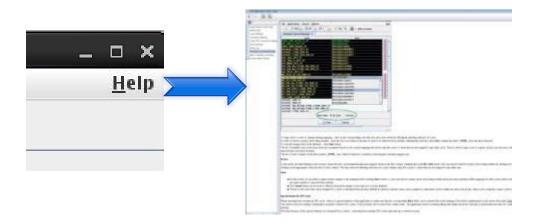




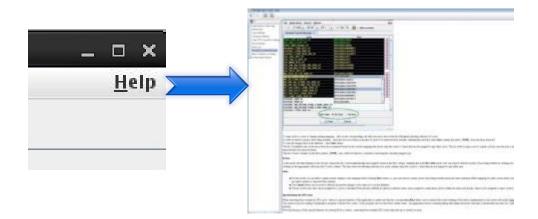


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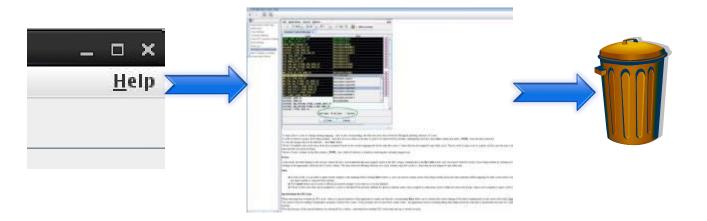




















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- Front-End Process
- Middleware
- Java Server
- GUI Bug







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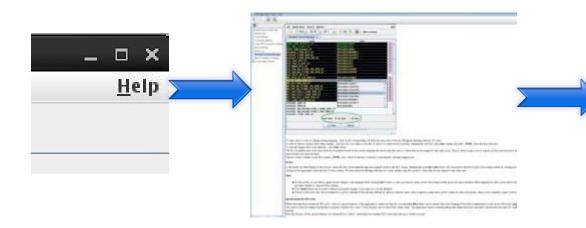
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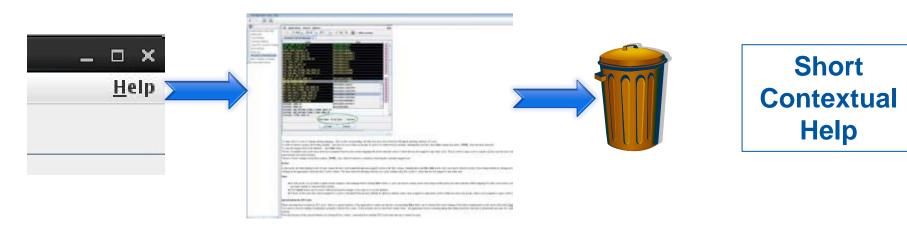






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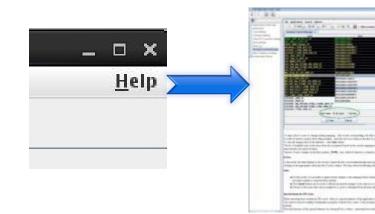


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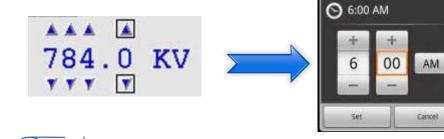




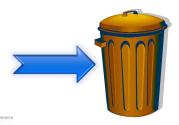
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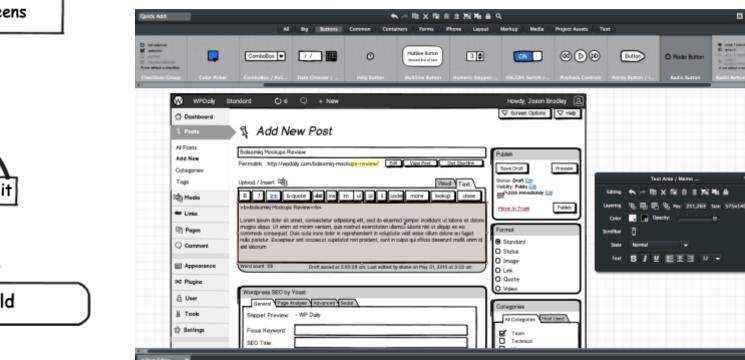


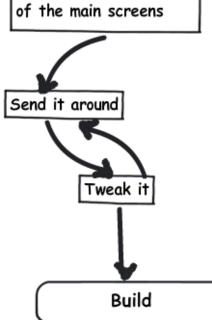


#### 10/7/2013

## **Quick GUI sketches**





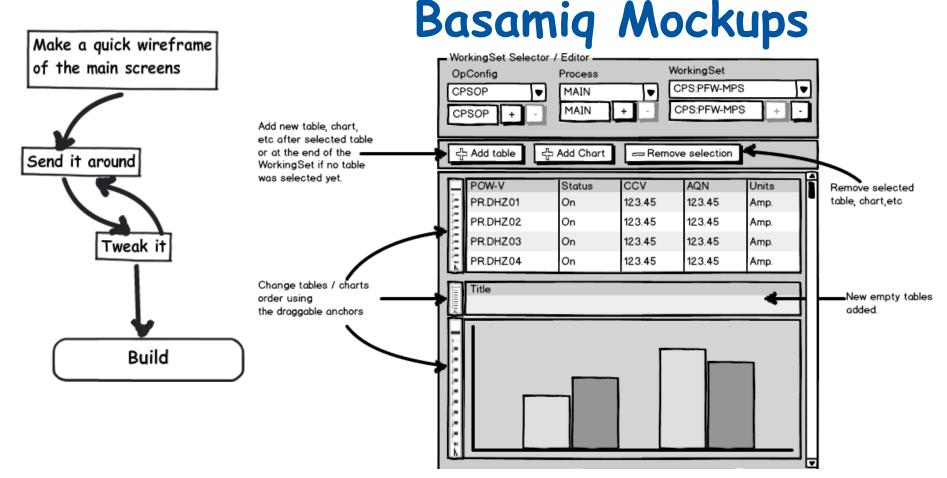


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## **Quick GUI sketches**





### **Lessons Learned**

# It's the technical issues, stupid!

- Don't underestimate habits
- Stay close with users
- Focus on simplicity it's the key





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