




# Testing - End-to-End

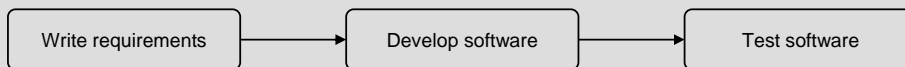


**AGFA** 

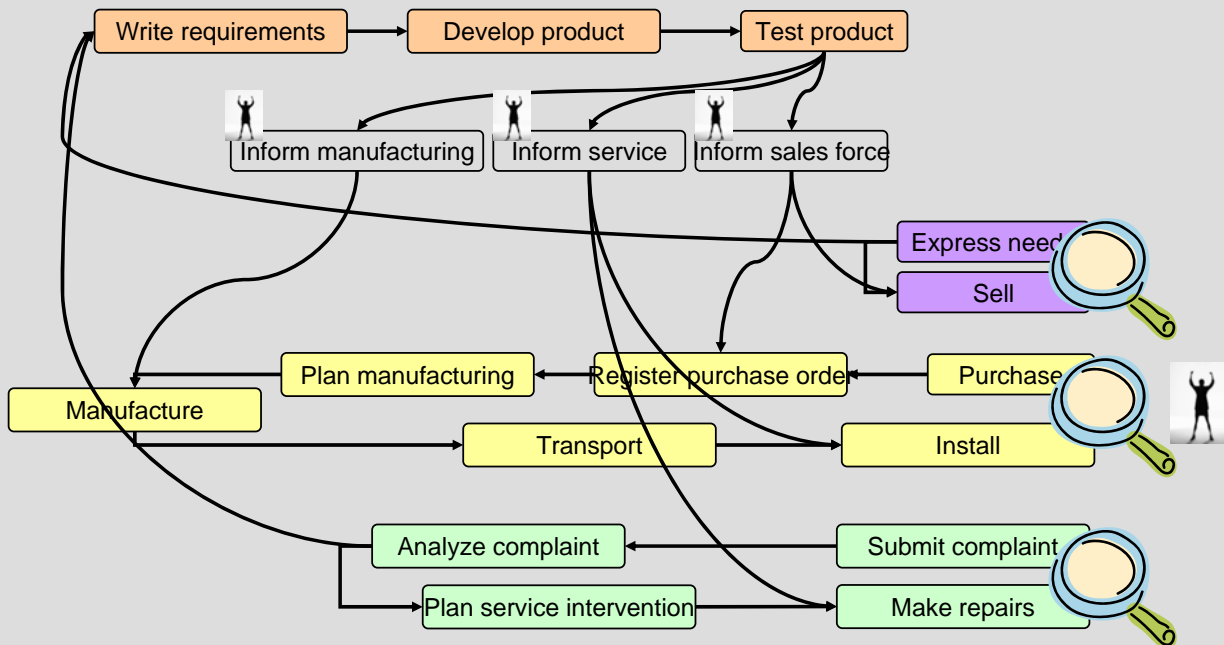
| see more | do more |

## Traditional context

End user 



## Attempt to link both worlds

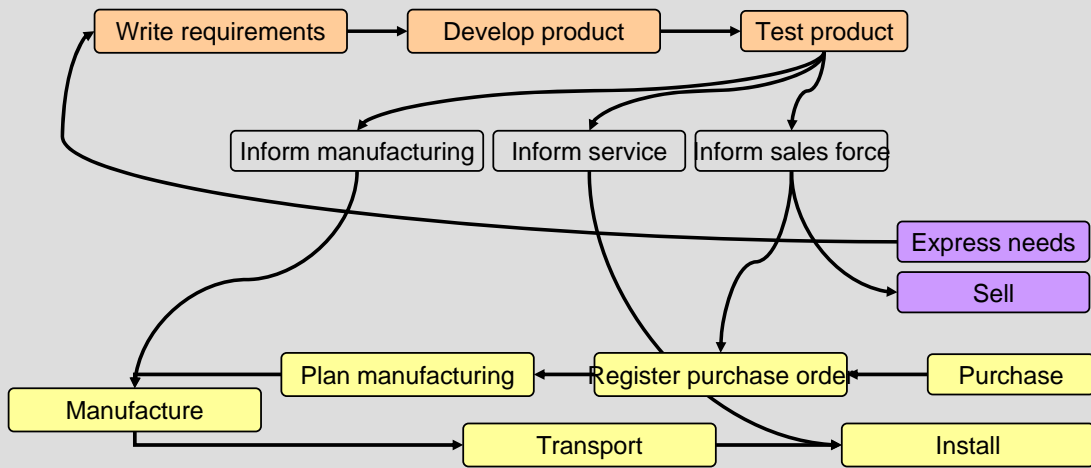


## Validation

- Product validation ( ~ design validation )
  - Does the product satisfy the customer's needs ?
  - Did we make the right product ?
  - ...
- Process validation
  - Do the processes deliver the expected results ?



# Product validation – Why it can go wrong



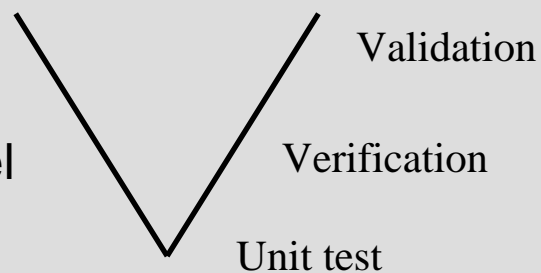
## Product validation – ‘Intended Use’

- What do we claim that the product can do?
  - E.g. “...can determine the optimal mix of ingredients for concrete of a given strength.”
- Who is the user
  - Concrete mill operator
  - Concrete mill procurement department
- In which environment is the product used?
  - Concrete mill
  - Administrative environment

## Product validation – In the overall test strategy

- It's a matter of perspective...
- A developer's reference is the design
- A verification tester's reference is the requirements
- A validation tester's reference is the end-user

- Or,  
in terms of the V-model



## Product validation – Test techniques

- Storyboard reviews
- Surveys
- Literature studies
- Prototyping
- Usability labs
- Installing and monitoring and customer's site
- Double-blind tests

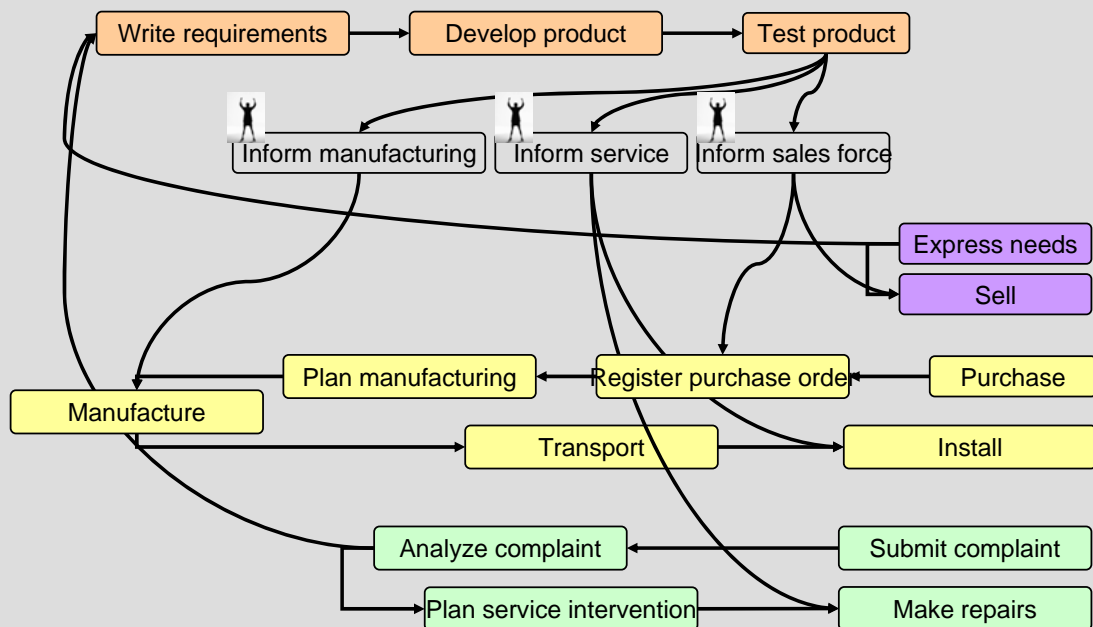


## Product validation – When is this important

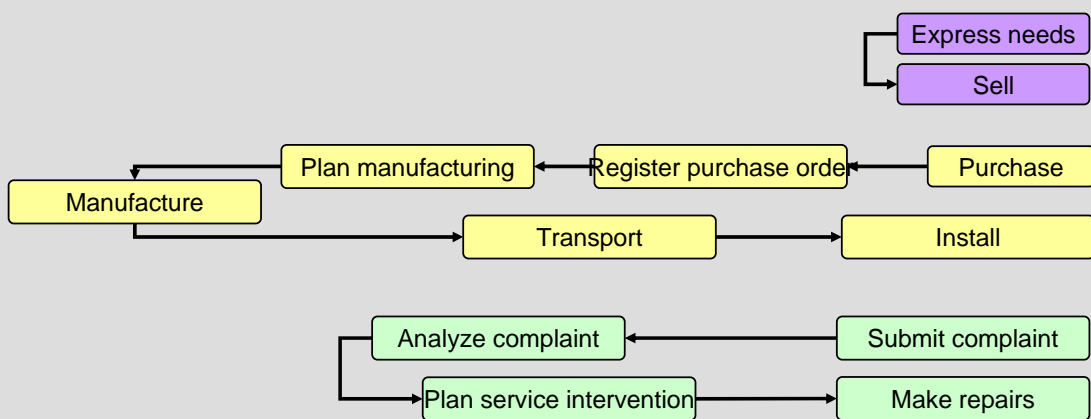
- When satisfying the user needs/intended use is critical
  - Commercially
  - Reputation
  - Regulatory
- When the cost of correcting errors is high, in terms of
  - Money
  - Human health
  - Environmental
  - ...



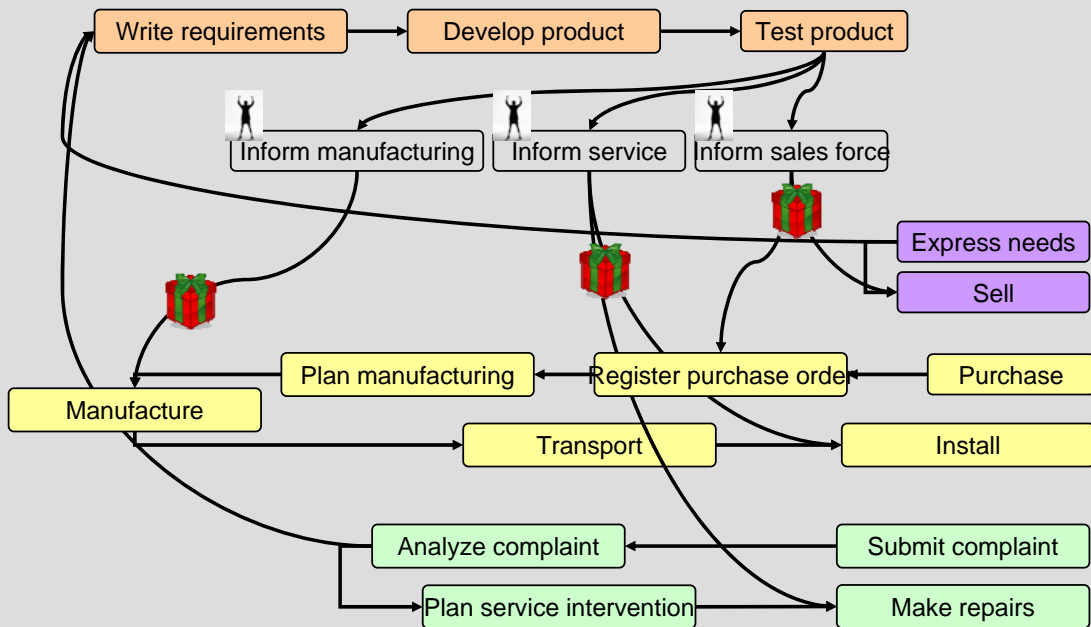
# Process validation – Why it can go wrong



# Process validation – It's about process



# Process validation – It's about scope



## Process validation – Test techniques

- Have manufacturing, service, sales, ... collateral
  - Included in the requirements
  - Verified as usual
  - Perform 'product' validation techniques
- Define in-process controls
  - Purchase order validation
  - Outgoing inspection after manufacturing
  - Acceptance test after installation
- Do a dry run
  - Make a purchase order
  - Have it manufactured
  - Have it installed
  - ... and look at the results

## Process validation – When is this important

- When process performance targets are set
  - Lead time
  - Dead on arrival
  - Administrative costs
  - ...
- When the cost of correcting errors is high, in terms of
  - Money
  - Customer satisfaction
  - ...

## Conclusion – Problems and pitfalls

- Problems
  - Expertise is required which may not be available
  - Expensive: surveys, renting usability labs, ...
  - Time-consuming
  - Unpopular : It delays market introduction
- Pitfalls
  - It's not another verification cycle

## Conclusion – Critical success factors

- Make sure to have a business case
- Invest in process-awareness
- Team-up with manufacturing, service, sales,...