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CUST 217 - So Easy a "Greybeard" Can Do It: Mobile Paperless Engineering

Vanessa Martins
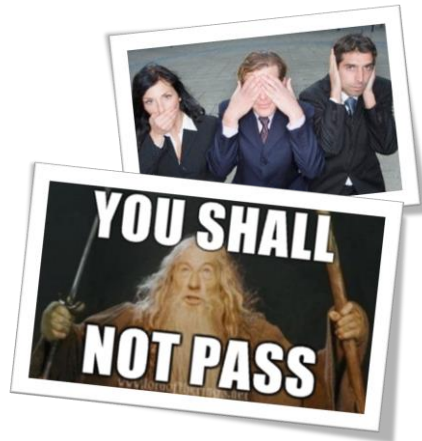**Steven LaPha**
NASA KSC - ESC

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The Engineering Services Contract (ESC) at Kennedy Space Center (KSC) provides services to NASA in respect to flight and ground systems design and development. To aid this effort, the ESC Principal Engineering Technology Development Group investigates and provides the necessary tools, aid, and best practice methodologies required for efficient, optimized design and process development. The team is responsible for configuring and implementing software, along with training, documentation, and administering standards. The team—comprising of 5 members—supports over 200 engineers and design specialists with the use of Windchill, Creo Parametric, NX, AutoCAD, and a variety of other design and analysis tools.

Defining a "Grey Beard"

A PERSON (OF ANY AGE) WHO RESISTS CHANGE

Note: beard (of any length or color) not required to be considered a "grey beard"

YOU SHALL NOT PASS

What Happens Today

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Demo

So Easy a "Greybeard" Can Do It: Mobile Paperless Engineering – CUST 217

The Challenge

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- Demonstrate a proof of concept that eliminates the need for paper in the various engineering phases
  - Printed documents
  - Engineering drawings

- Improve the ability to access, capture, and share information within a centralized, accessible electronic system by using secure portable electronic devices

- Increase the productivity and efficiency on engineering work tasks, while also reducing environmental impact and process related costs
  - Printing
  - Work completion time

So Easy a "Greybeard" Can Do It: Mobile Paperless Engineering – CUST 217

- **Resources**
  - Utilize readily available resources
    - Webmail
    - Messaging applications
  - Incorporate use of PLM system
    - PTC Windchill 10.2 M020

- **Security**
  - Limit use to secure networks
    - Internal NASA wireless network
    - VPN
  - Adhere to all IT Security policies

- **Cost**
  - Minimal ramp-up cost
    - Hardware acquisition
    - Applications and/or software purchases
 - Low maintenance cost

- **Safety**
  - Use may occur in high-risk areas
    - Near the SLS vehicle
    - High locations, with potential for FOD
  - Ability to tether or secure devices

- **Environment**
  - Exposure to potentially harsh work locations
    - Heat (minimal to no air conditioning in Florida)
    - Humidity
  - Consideration of both indoor and outdoor locations

Criteria

- **Ease of Use**
  - Would training be needed, or is it intuitive?

- **User Interface**
  - Can it be used out of the box, or are additional applications needed?
  - Can a user easily complete functions?

- **Accessibility and Interaction with PTC Windchill**
  - Can the server/system be accessed and used?

- **Communication**
  - Can users utilize various communication tools?

- **Ability to Perform Work Functions**
  - Can everyday engineering work functions be performed?
  - Can every day managerial work functions be performed?

Test Cases

- Documents
- Drawings
- Feedback/Markups
- Features
- Models
- Communication
- Processes
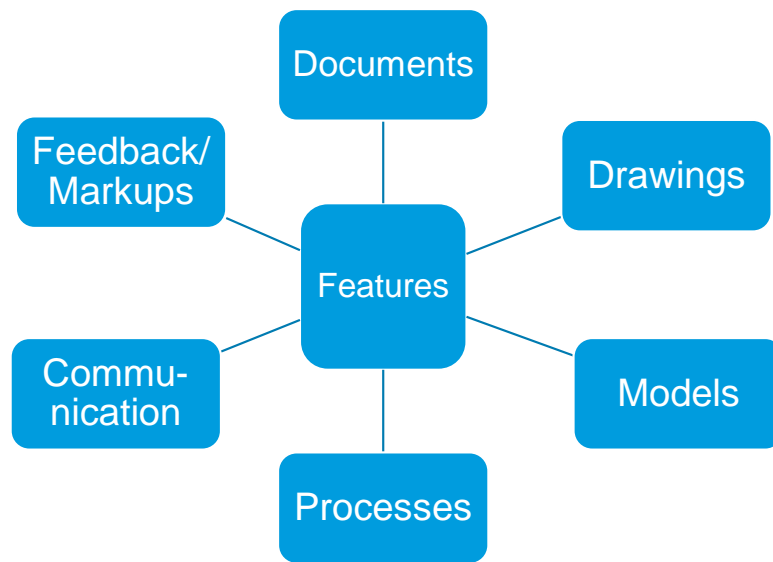
- **Accessing information while in the field**
  - Reviewing drawings
  - Opening documentation
  - Viewing models
  - Updating metadata

- **Submitting and completing change objects**
  - Problem Reports, Change Requests
  - Receiving and completing workflow/process tasks

- **Communicating with others on center**
  - Ease of access to e-mail, video, and other communication tools

Tablet Specifications

	Galaxy Tab Pro	iPad Air 2	Surface Pro 3
Manufacturer	Samsung	Apple	Microsoft
Operating System	Android	iOS 8	Windows 8
Processor	1.9GHz	A8X, 1.5GHz	Intel Core i3, 1.5GHz
System Memory (RAM)	3 GB	2 GB	4 GB
Storage Capacity	32 GB	64 GB	64 GB
USB Ports	1 USB 3.0	No	1 USB 3.0
Price	$684.99	$676.98	$769.99

First Test Case

- All tablets tested without any additional apps, programs, etc. installed

- Tests run on all browsers delivered with tablet

- Multiple "in-network" locations attempted

- Various methods/approaches used in attempt to accomplish test

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First Test Case – Results Summary

	Galaxy Tab Pro	iPad Air 2	Surface Pro 3
Ease of Use	😐	😐	😐
User Interface	🙂	😐	🙂
Accessibility and Interaction with PTC Windchill	😐	☹️	😐
Communications	🙂	🙂	🙂
Ability to perform Work Functions	😐	☹️	😐

Improvements

Fixes for Second Testing Phase

Galaxy Tab Pro

- Install PDF viewer
  - Adobe Acrobat Reader

- Install additional browsers
  - Chrome

- Install Lync app

- Install Outlook app

iPad Air 2

- Install PTC Creo View app

- Install PTC Windchill app
  - Verify system is configured for mobile application
  - Setup app for system

- Install PDF viewer
  - Adobe Acrobat Reader

- Install additional browsers
  - Chrome

- Install Lync app

- Install Outlook app

Surface Pro 3

- Install PTC Creo View program
  - Completed on tablet desktop

- Install PDF viewer
  - Adobe Reader Touch

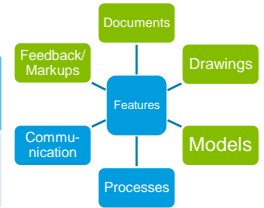- Install additional browsers
  - Chrome

- Install Lync app

Testing

Second Test Case – Results Summary

	Galaxy Tab Pro	iPad Air 2	Surface Pro 3
Ease of Use	😐	😐	😐
User Interface	🙂	😐	🙂
Accessibility and Interaction with PTC Windchill	😐	😐	🙂
Communications	🙂	🙂	🙂
Ability to perform Work Functions	🙂	😐	🙂

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Galaxy Tab Pro

	Access in Browser	View in Browser	Open in Application
Models	✅	❌	❌
Documents (PDF)	✅	❌	✅
Documents (Native file)	✅	✅	✅
Drawings (PDF)	✅	❌	✅
Markups (Redlines)	✅	❌	❌

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Galaxy Tab Pro

	Access in Browser	View in Browser	Open in Application
Communication (E-mail)	✅	✅	✅
Communication (Instant Message)	N/A	N/A	✅
Communication (Video)	N/A	N/A	✅
Processes (Workflows)	✅	✅	N/A

Results

iPad Air 2

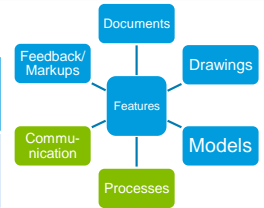|	Access in Browser	View in Browser	Open & View in Application*
Models	✅	❌	✅
Documents (PDF)	✅	❌	✅
Documents (Native file)	✅	❌	✅
Drawings (PDF)	✅	❌	✅
Markups (Redlines)	✅	❌	✅
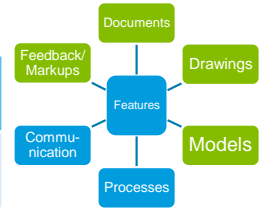
Note: In order to open a viewable in Creo View application, the file had to be download and opened separately. There is currently no seamless integration between the Windchill and Creo View apps.
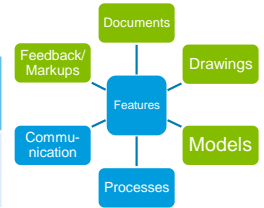

Results

iPad Air 2

	Access in Browser	View in Browser	Open in Application
Communication (E-mail)	✅	✅	✅
Communication (Instant Message)	N/A	N/A	✅
Communication (Video)	N/A	N/A	✅
Processes (Workflows)	✅	✅	N/A

Results

Surface Pro 3

	Access in Browser	View in Browser	Open in Application
Models	✅	❌	✅
Documents (PDF)	✅	✅	✅
Documents (Native file)	✅	✅	✅
Drawings (PDF)	✅	✅	✅
Markups (Redlines)	✅	❌	✅

Results

Surface Pro 3

	Access in Browser	View in Browser	Open in Application
Communication (E-mail)	✅	✅	✅
Communication (Instant Message)	N/A	N/A	✅
Communication (Video)	N/A	N/A	✅
Processes (Workflows)	✅	✅	N/A
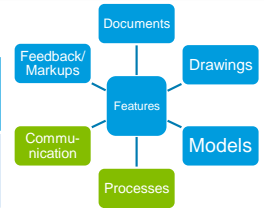
Demo

Final Results

Questions?

- Your feedback is valuable

- Don't miss out on the chance to provide your feedback

- Gain a chance to win an instant prize!

- Complete your session evaluation now