



Human Factors & Ergonomics

Case Study

Digital SLR, Lumix G100

Novice Filmmakers

Wireless export from camera to smartphone

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Product

Today we're assessing the **Lumix G100 Digital SLR (DSLR)** camera, an economical, yet professional quality camera - but does it live up to it's marketing propositions? This analysis will assess the qualities of this camera, focusing on its performance doing a wireless export, maintaining a smooth workflow and lossless quality video.

Given those expectations, this report will review the typical DSLR users, outline task analysis, review Human Factors Requirements, and provide a Human Factors Evaluation, summarizing observations along with recommendations for improvements.

Problem Scope

1. DSLR markets have been decimated by the advent of smartphone video capabilities
 - By 2010 the DSLR Cameras lost 87% of their market share to smartphones. This means that the quality and ease of use for these cameras must provide enough value for that market to hold its own against smartphone features and capabilities, e.g. the ability to take video on a phone and then upload it wirelessly to a video cloud service such as Vimeo or Google.
2. To offset further market disruption, DSLR products must expand their features to match and/or exceed the evolving features of smartphones
3. Given the high bar inherent in these challenges, does the wireless export feature found on some DSLRs measure up to its claim of providing a usable, useful and desirable user experience when using the wireless export feature?



Social Media Marketing Gaze



Privileged White Man Issues

Users

Proto-Persona: Dan Dubois, Digital SLR User



Demographics

Living in Arizona, Dan is a 32 year old family man with two kids, ages 3 and 5. He makes \$65K/yr as a store manager.

Personal Goals

Spend time with his family
Enjoy his hobby as an aspiring filmmaker

Behavioral

Uses his Smartphone for most of his video, but wants to produce his own film someday, using a DSLR, 4K output

Expectations

Find a DSLR camera that can export video wirelessly, is not too heavy and is fun to use

Pain Points / Frustrations

Cumbersome Wireless connectivity
Slow video exports

Best Outcomes

Transfer video easily from the camera to any device that is wireless
Can access an Owner's Manual with easy to read instructions

Task Analysis



Task Analysis

Task	Perception	Cognition	Action	Usability Issues
1. Read the directions				
1.0 Access and read the directions	Awareness of two sources of product information	Knowing where to generally look for the wireless exporting info	1.1. Refer to OOB Owner's Manual (OM)	
	Awareness of two sources of product information	Knowing where to generally look for the wireless exporting info	1.2 Or -- Locate an online OMI PDF	The URL was in the hardcopy OM but was 83 characters long and presented in 8 pt. or less font size
	Aware of expedited ways to find information	Know where to look for the wireless exporting info, using shortcut keys, like Command + F to quickly find the relevant information in a 500+ page PDF.	1.3 Locate the relevant information in the online OM in PDF	
	Previous knowledge regarding quickly finding reference the instructions	Deciding that looking up info as needed will be more efficient than memorizing	1.4 Refer to instructions online when operating the camera	
2. Start the camera				
2.0 Start the camera	Awareness of DSLR operations	Look for the start button/switch	2.1 Locate the On button	
			2.2 Press the On button	
3. Record Video				
3.0 Preparing and shooting video	Previous experience with DLSRs informs next steps	Decide to take next steps	3.1 Remove lens cover	
			3.2 Set to video mode	
			3.3 Shoot video	

Task Analysis

Cont'd

Task	Perception	Cognition	Action	Usability Issues
4. Wirelessly Export Video				
4.0 Export Video	Aware that the DSLR has an a menu shown on the display screen	Decide to access the camera menu	4.1 Access the camera's internal operations menu	
	Camera menus are shown on the display screen	Take steps to navigate through the menu to view the export functions	4.2 Flip open the display screen and use instruction labels and icons to navigate: Main Menu > Wrench > Bluetooth	
	Camera menus are somewhat clunky when setting up internet connections	Decide to spend the time to use the menu to set up the internet connection	4.3 Set up an internet connection using the type-via-conrol-dial to input your password	Non intuitive Non-linear input Poor labeling
	Smartphone Apps can be added easily on the Pixel 3	Decide to install the Lumix App	4.4 Install the Lumix mobile App on my Pixel 3, Google smartphone	
	The online OM in PDF is easy to navigate	Do keyword searches using shortcut keys	4.5 Refer to Lumix camera's online PDF for more information on how to connect the two	
	Unaware of what the DSLR menu will show	Take the steps to export, using the internal camera menu on the camera's preview screen	4.6 Locate and review the export options: PC (not Mac), smartphone, Cloud Sync Service, Web Service, AV Device, Printer	Very confusing and not a good option to export to a smartphone, due to limited storage. Discovering that the phone does not export to my Mac laptop
	Unaware of what will be the easiest way to export	While working through the next steps, decide that it may be easier to do this via the smartphone Lumix App	4.7 Discover that it's easiest to use the Lumix Smartphone App to connect to camera	
	Discovering that the Lumix App is easier to use for exports	Decide to use the smartphone Lumix App	4.8 Connect the smartphone to the camera using bluetooth connectivity	
	How long is this taking me?	Decide to explore the quickest way to export, but proceed with the Lumix App on the smartphone	4.9 Wonder why you just don't use a cable to do all this	Investing too much time to do a simple function
	The Lumix App installation setup was so easy that it bodes well for the next steps	Decide to proceed with the export functionality	4.10 Once connected, use the Lumix smartphone App to select the photos and/or videos to transfer.	discover that the Lumix smartphone App is much easier to use to accomplish the transfers of images and video
5. Confirm Success				
5.0 Confirm successful export	Some exports will work but may deprecate the output	Take steps to locate the exports	5.1 Locate the exported photo or video	
	Comparisons can be tricky	Decide to spot check the quality	5.2 Open the digital asset to compare the quality of smartphone to Digital SLR.	
	Understanding of what criteria to use to assess the photos and video quality	Take steps to assess the exports	5.3 Confirm that the quality is appropriate or not	
	With new processes, duplicating the steps may be necessary for dependable comparision	Decide to retest	5.4 If not appropriate, retest the process	
	Amazon returns process is smooth	Decide to return the camera	5.5 If quality remains poor, consider returning the camera	

Task Analysis Cont'd

Connecting to a smartphone instructions and links begin to make learning the process much easier.

Flow of connecting a smartphone

1	Install “LUMIX Sync” on your smartphone. (→374)	
2	Connect to a smartphone. Using a smartphone that supports Bluetooth Low Energy <ul style="list-style-type: none">• Bluetooth connection (→375) Using a smartphone that does not support Bluetooth Low Energy <ul style="list-style-type: none">• Wi-Fi connection (→380)	
3		Operate the camera using the smartphone. (→386) <ul style="list-style-type: none">• [Remote shooting] (→387)• [Shutter Remote Control] (→389)• [Import images] (→391)• [Auto Transfer] (→393)• [Location Logging] (→395)• [Remote Wakeup] (→396)• [Auto Clock Set] (→397)



- You can also use the camera to transfer images to a smartphone. ([→400](#))

Task Analysis

Cont'd

The simplest directions I've come across, turn out to be the best, but I had to parse through the manual longer than expected.

Operating the camera in accordance with the smartphone guide.

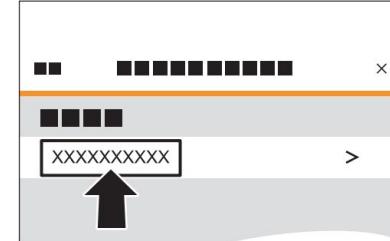
3 Set the camera to Bluetooth pairing standby state.

-  [MENU] → [] → [Bluetooth] → [Bluetooth] → [SET] → [Pairing]
- The camera enters pairing standby state and the device name Ⓐ is displayed.



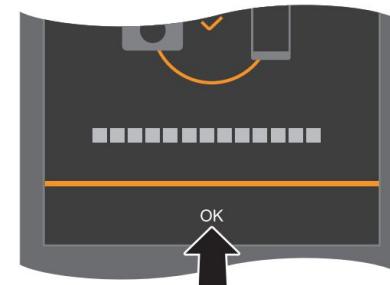
4 On the smartphone, select the camera's device name.

- (iOS devices) When a message to confirm the change of destination is displayed, select [Join].



5 When a message indicating that device registration is complete, select [OK].

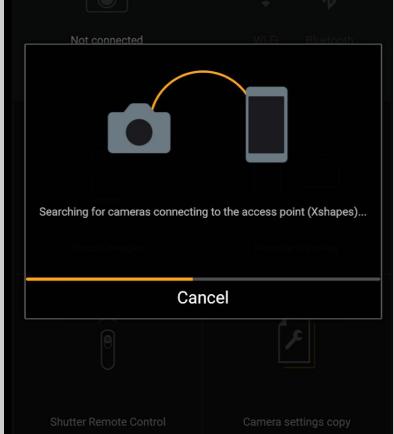
- A Bluetooth connection between the camera and the smartphone will be made.



Human Factors Requirements

Physical Ergonomics	Requirement	Value	Justification	Meets?
Anthropometrics - Grip of device	Accomodates median hand size	9.1 x 9.1 x 9.1 inches	Proctor & Zandt, 2008	Predominantly
Anthropometrics - Handedness	Accomodate left and right handed users	(Not an industry standard)	Proctor & Zandt, 2008	No
Anthropometrics - Placement of finger on device	Haptic Interaction with operational components is appropriate	Accomodates the width of a digit (thumb or index finger) 20-21 mm	Proctor & Zandt, 2008	Yes
Anthropometrics - Camera weight	Weight should not add to the effort	1.3 pounds	Proctor & Zandt, 2008	Yes
Cognitive Parameters	Requirement	Value	Justification	Meets?
Learnability	Operating the camera provides good affordances and signifiers	Technical Instructions are confusing and difficult to learn	Norman (2013)	Partially
Usability	Camera menus are easy to use	Signifiers are not intuitive	Norman (2013)	Partially
Export process is easy to learn	Exporting is easy to do	Instructions were too complicated, making learning curve high	Nielsen Norman (2019)	Partially
Emotional Resonance	Requirement	Value	Justification	Meets?
Overall experience	The expereience using the camera is positive	The baseline experience proved to be difficul and overwhelming at times.	Nielsen Norman (2003)	Partially

Human Factors Evaluation



Observations

1. Ultimately, this analysis has made me rethink my decision to recently purchase this camera, due to the lack of easy connectivity to my MacBook Air laptop.
2. This wireless exporting function was an uber-awful User Experience for the following reasons
 - Difficult Technical Instructions
 - Unintuitive Menus on the camera
 - Discovering that this camera will only export to PCs, not Macs
 - Labels used on the camera's menu were confusing
3. When searching the Panasonic parent website for this DSLR camera, you get "0" results
4. The URL included in the Owner's Manual was 82 characters long and appears in a 7 pt. Font size, making it difficult to read and easily access.

Recommendations

1. Improve the Instructions in the Owner's Manual
2. Improve the character input interface - very confusing and hard to use
3. Provide an easy way for customers to find Lumix G100 product information on the Panasonic website
4. Provide for cross-platform export functionality to cover Macs
5. Allow users to more easily export to common social media platforms
6. Provide a vanity URL for product info, e.g. www.lumixG100.com/product-guide

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