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January 2020

## ENHANCED SYSTEM ERRORS FOR IMPROVING FIELD SERVICE SUPPORT AND CUSTOMER ISSUES REPORTING

HP INC

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### Recommended Citation

INC, HP, "ENHANCED SYSTEM ERRORS FOR IMPROVING FIELD SERVICE SUPPORT AND CUSTOMER ISSUES REPORTING", Technical Disclosure Commons, (January 30, 2020)  
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## Enhanced System Errors for Improving Field Service support and Customer issues reporting

This disclosure relates to the field of error reporting in a device's user interface. In this disclosure it is proposed to embed dynamically generated information to the System Error reported in the User Interface (UI). This dynamically generated information will provide certain configurable parameters like the Part Number and Serial Number of the device, the ID (identifier) of the session logs which will contain the issue, timestamp of the occurrence, telemetry session when the issue occurred and any other sub-system specific information depending on the concrete system error. Then, a mechanism should be provided to the user to capture this information from the printer UI. One possible implementation of this idea (but not limited to) could be to encode all these parameters in a URL which later is converted to a QR code. This way, any QR reader could univocally get all the information and then offer different options to the user. In this case, the user just taking a picture of the error with a QR reader application, will be redirected to the proper support web, already filled with that device/error data, to get help: information, workaround, fixes, or an option to open a support ticket which would automatically include all the required information as provided with the enhanced System Error information avoiding any human error in the reporting of the required information. As any webpage, this allows to include as much information and resources (images, videos) as desired. If there's a support customer visit, the technician can use this same mechanism to access specific information about the error or escalate it.

Nowadays it is critical to any business that, in case of a device failure, the process of solving it or getting help from customer support is as fast and comfortable as possible. It's important in terms of user satisfaction and business value, but also directly saves huge amounts of money to the company if customer calls and support visits can be reduced to a minimum. This disclosure targets two main components in this process: 1) How the user gets the diagnostic or repair information by herself or himself, and 2) In case s/he is not able to solve the problem, how to transmit all relevant information to customer support with the less effort and fastest speed possible, in a reliable way.

The main use of the proposed enhanced System Errors system is on the field, when a device is installed in the customer place. This system allows the user to quickly access a web page containing relevant user manual content or specific information about the error (even particularized by the specific device model or hardware configuration), quick fixes and workarounds, or an option to directly submit a case to Customer Support, that would automatically contain device information captured from the enhanced System Error information, such as the device model, error code, timestamp, or any other parameter that could be useful for the technical support team. This would solve the need to manually retrieve and submit this information, saving time and preventing errors, or accelerate any repair or workaround that the user can do by itself, reducing device downtime

In one example, this information could be encoded in a URL which in turn is shown as a QR code. By implementing a simple user categorization in this web page, a support technician that is repairing the device could take a picture of the same QR to have immediate access to extended technical information that is not public for the customer (such as repair tools or the full device manual) or escalate the case and open an internal ticket

Finally, this system would provide collateral benefits when the device is still being developed in the Research and Development (R&D) Lab. Device prototypes, with unfinished hardware and firmware, tend to produce a high amount of errors. Sometimes the device operators, due to lack of time or knowledge, don't properly log these errors in R&D defect tracking systems. This causes errors to be found later in the development process or consume more time to be detected and understood. Using this enhanced System Error dynamic system helps solving this matter. While in "development phase", the URL embedded in the QR would contain a link to any internal issue tracking tool. In case of a device error, the operator just needs to take a picture of the error QR to be redirected to the defect tracking tool and submit a correct defect just by filling a few fields and pressing a button. This allows to quickly have the error capture with all needed information to be later analyzed and fixed, increasing the quality of the product, and the developer can stay with the device and resume her/his operations immediately.

At a technical level, the device will gather relevant information when the System Error happens and then embed it in traces. The enhanced System Error including the gathered information should be exposed to the user in a way that it can be univocally retrieved from the printer, avoiding human errors. An option would be to encode the information as a QR code. As QR technology is quite simple, and we are already able to show icons and images in this System Error, this implementation would be straight forward to deploy. Next, describe the steps for an implementation of our disclosure using QR codes are described (however this concept could work with any other technology which would allow to univocally retrieve the dynamically captured information along with the System Error).

Steps:

1. When an error happens, the device generates a URL pointing to Support web page, including parameters of the device and the error code (could also include timestamps or other information). Then the device transforms the URL into a QR, as shown in Figure 1.

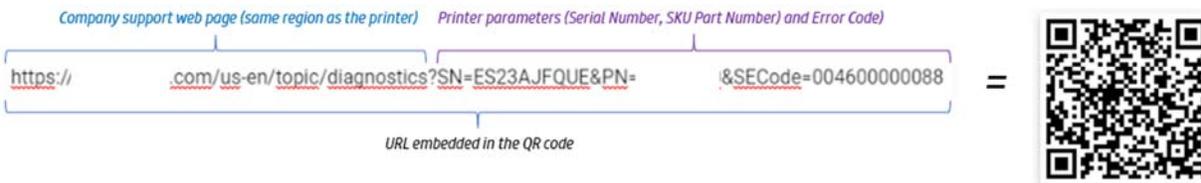


Figure 1. URL conversion to QR code

2. The device then includes this QR code in the error screen in the Front Panel. The user or technician just needs to open the phone's camera app and point it at the screen. It will recognize the URL and take the user to the support web, opening a specific page for that device and error



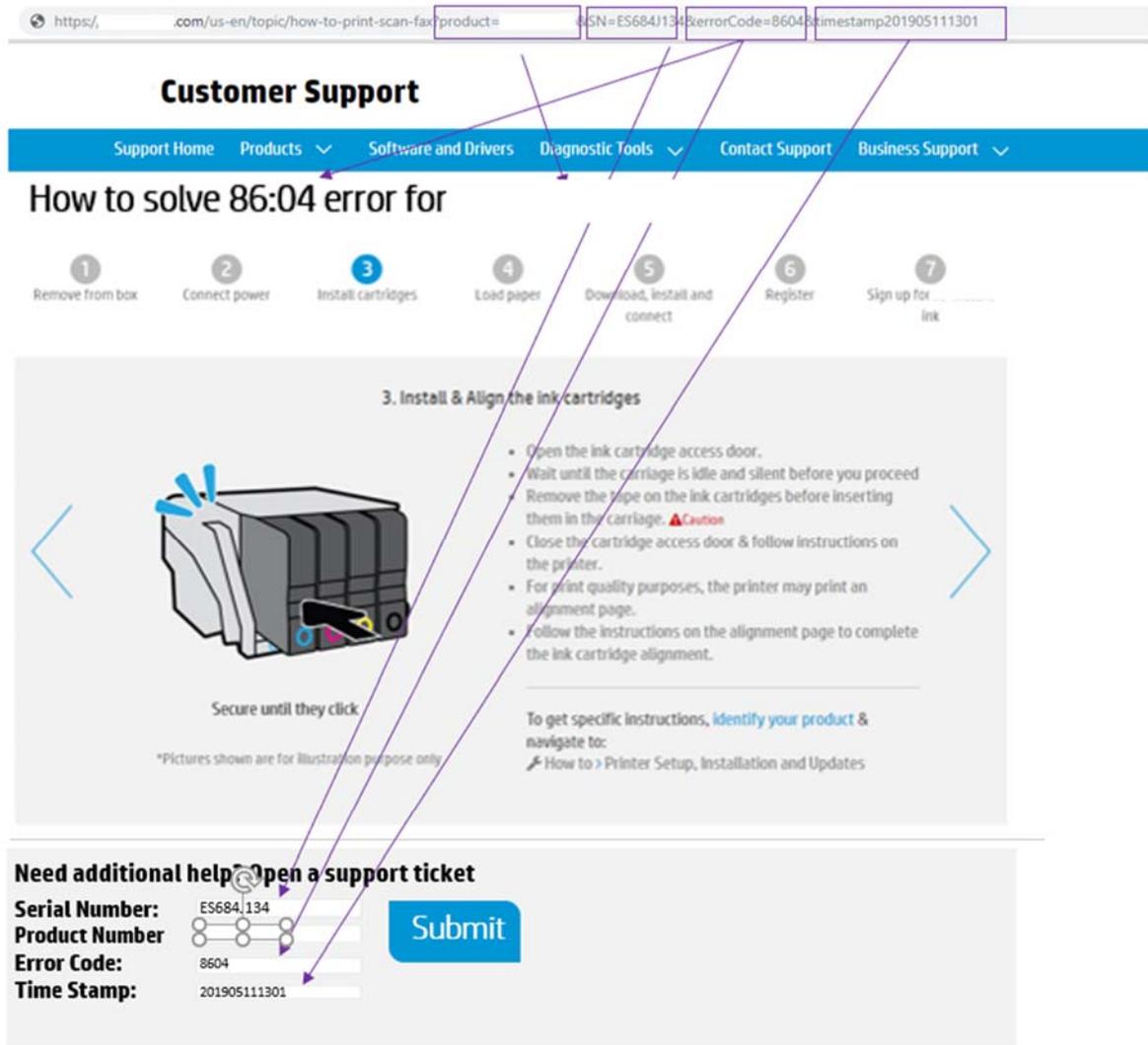


Figure 3. Support web page, personalized using the parameters included in the URL generated from the QR code

An improvement of this system could be by having a dedicated mobile application for reading the QR code which, could contain the user manual, or allow to automatically attach photos (e.g. depending on the code, requesting photos of specific parts of the device) and lots more of possibilities.

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