IBM PowerAI Visual Recognition and Watson Knowledge Studio

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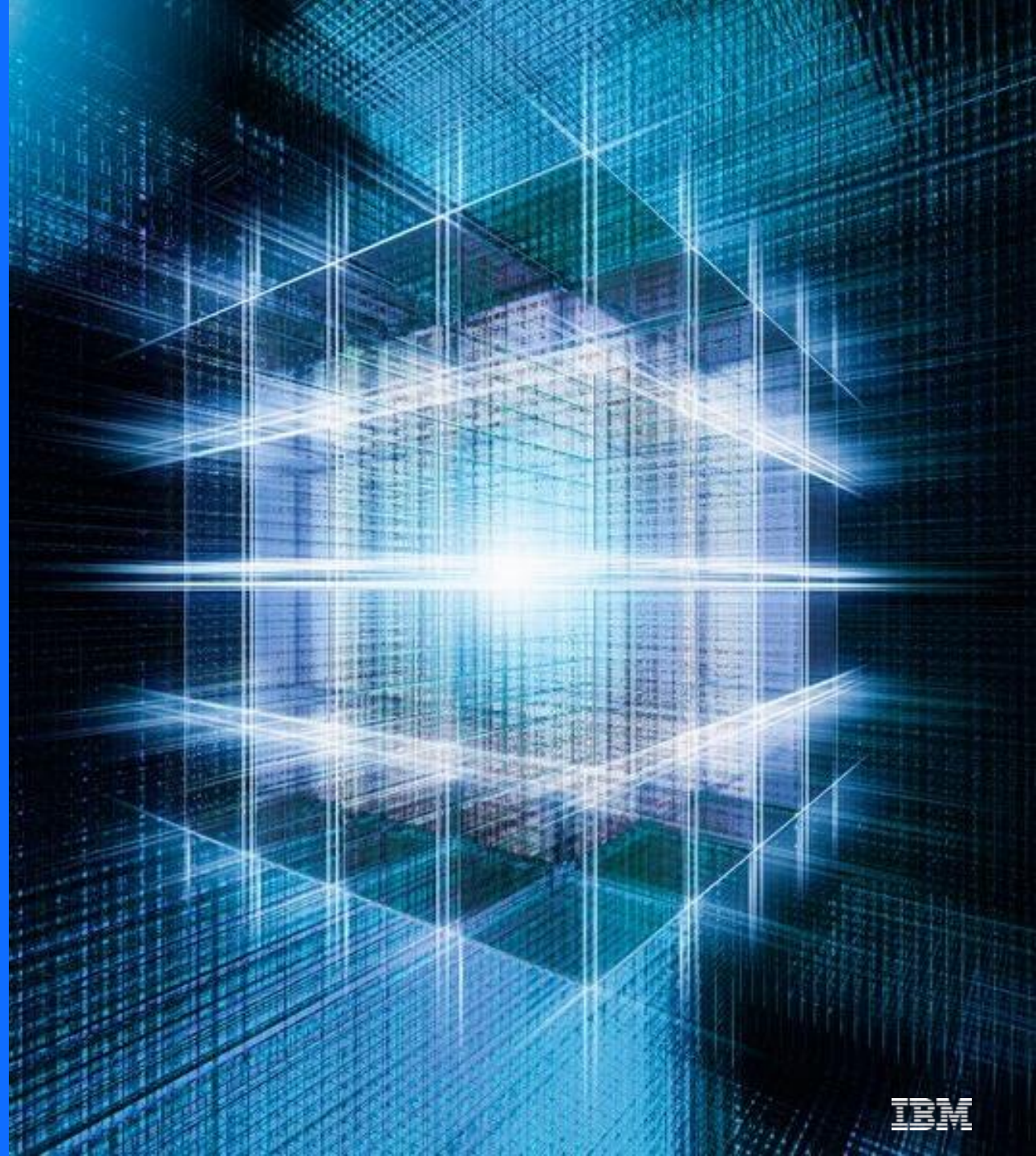
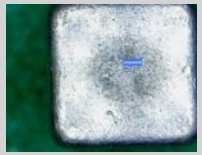
Consulting Supply Chain Management Professional



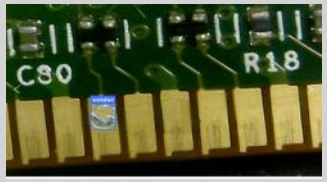
Internal education plan

Difficulty



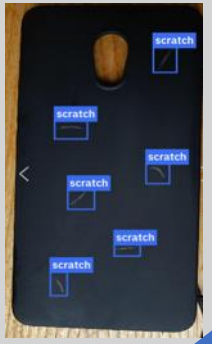
1. Exposed Copper

Client knows their requirements and has ready images



2. Solder on Gold

Client knows their requirements but has limited images



3. "Scratches" on phone

Client knows their requirements and has ready samples but no ready images

4. Facial Expression

Client has an idea, but can't define it into requirements suitable for PAIV

5. Vehicle classification

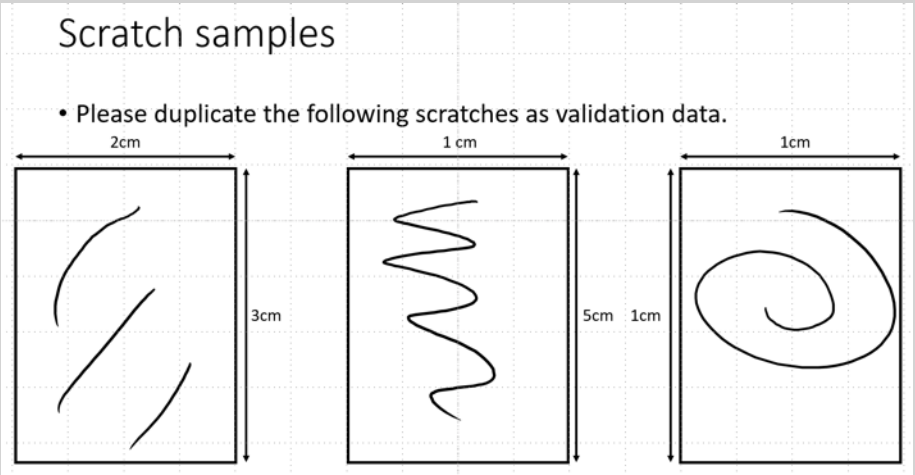
Client has an idea, but can't define it into requirements suitable for PAIV. Scenario is 'live' and uncontrolled.

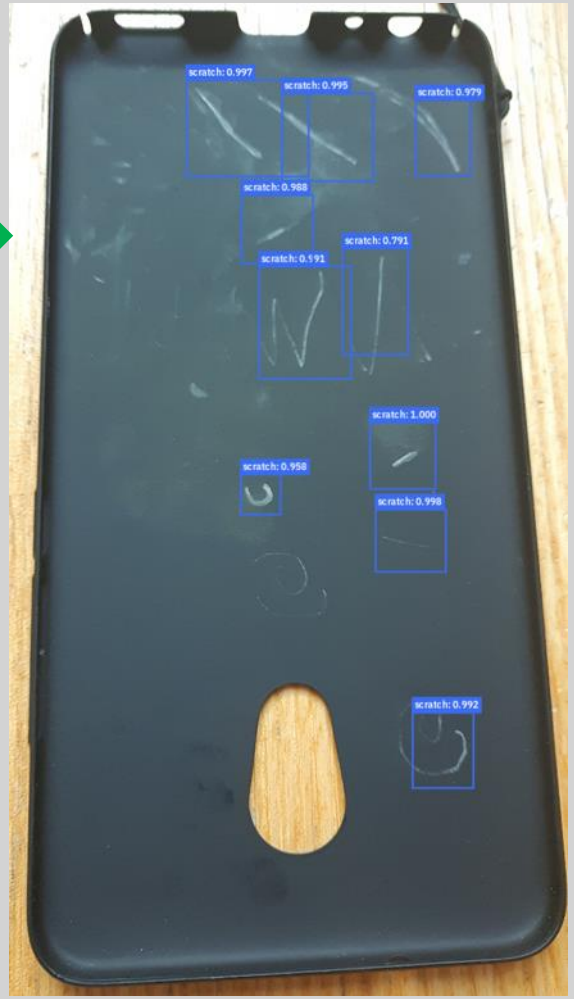
6. Traffic management

Client has a real life implementation.

Model training and validation results – scratches on phone use case

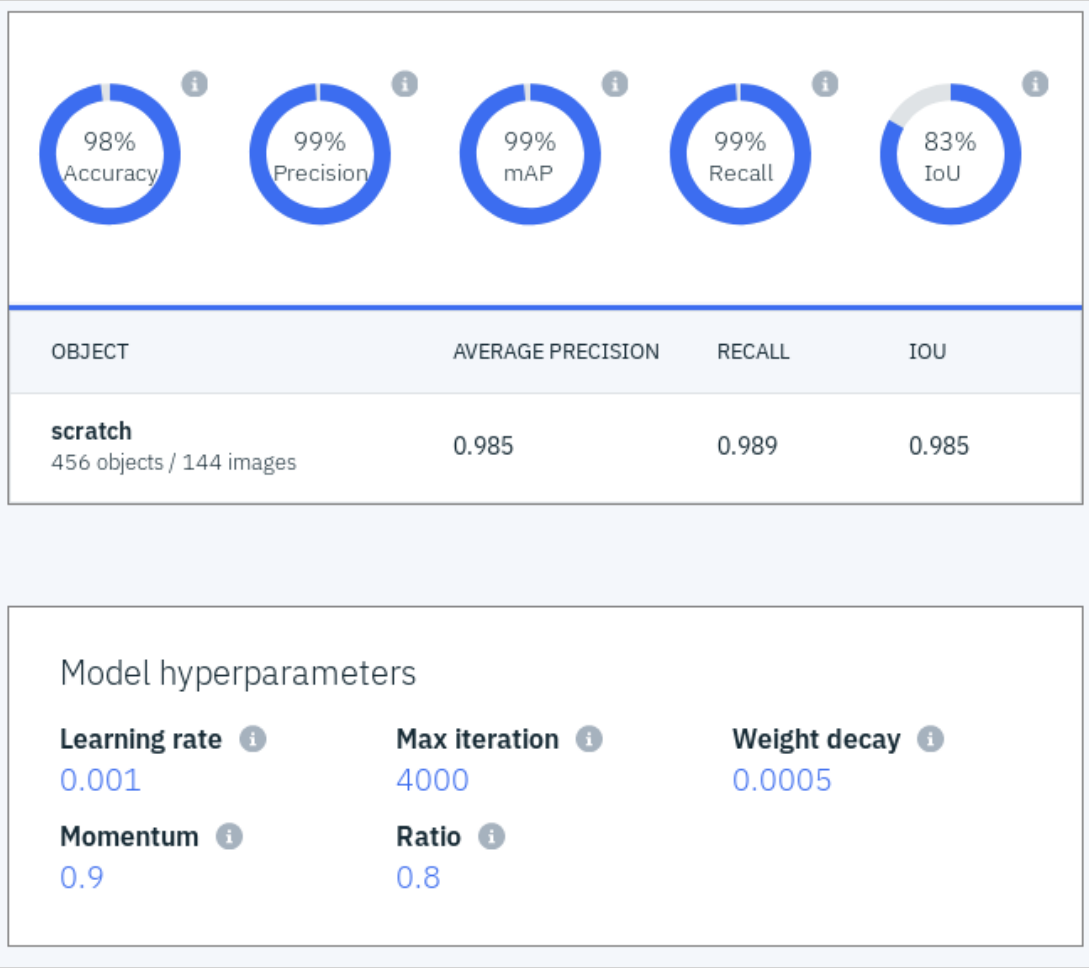
Customer’s final tests:





OBJECTS	RESULT	AVERAGE
scratch 10 objects	-	0.969
scratch	1.000	-
scratch	0.998	-
scratch	0.997	-
scratch	0.995	-
scratch	0.992	-
scratch	0.991	-
scratch	0.988	-
scratch	0.979	-
scratch	0.958	-
scratch	0.791	-

Model training and validation results – scratches on phone use case



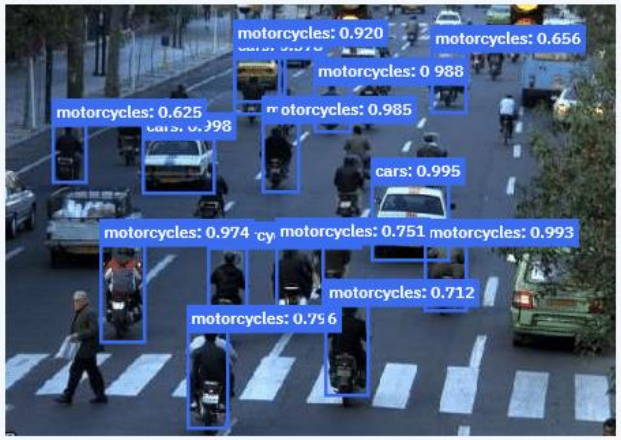
Training data:
9 + 3x 45 rotated, colored, sharpened images

Training time:
40 min

Accuracy:
98 % - could detect almost every scratches on phone cases even with such low original data set

Model training and validation results – vehicle classification images

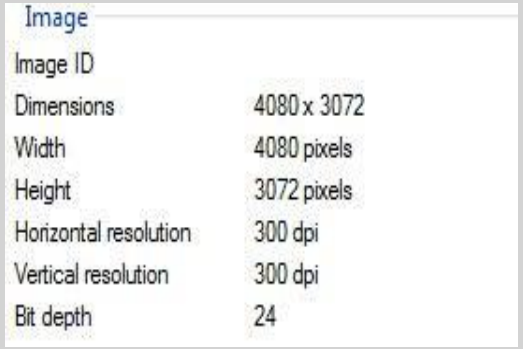
OBJECTS	RESULT	AVERAGE
cars 5 objects	-	0.883
trucks 4 objects	-	0.810

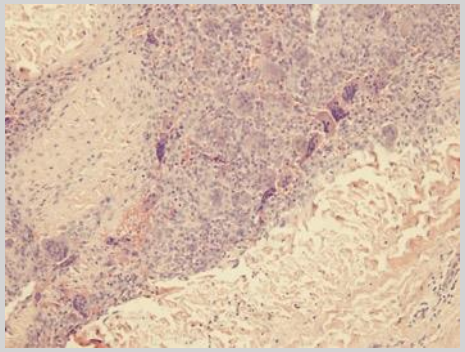


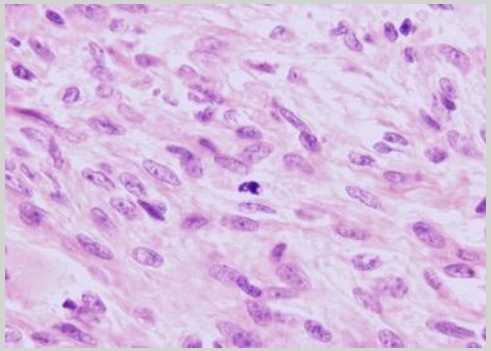
OBJECTS	RESULT	AVERAGE
cars 3 objects	-	0.857
motorcycles 11 objects	-	0.853

- Trained model based on 29 original images, and 145 augmented images (SHARPEN only)
- Object detection was used with default parameters
- Front and back views of the vehicles are used for training
- We have a model that can identify vehicles as cars, trucks, buses and motorcycles on daytime images and videos
- Training took about 30 minutes

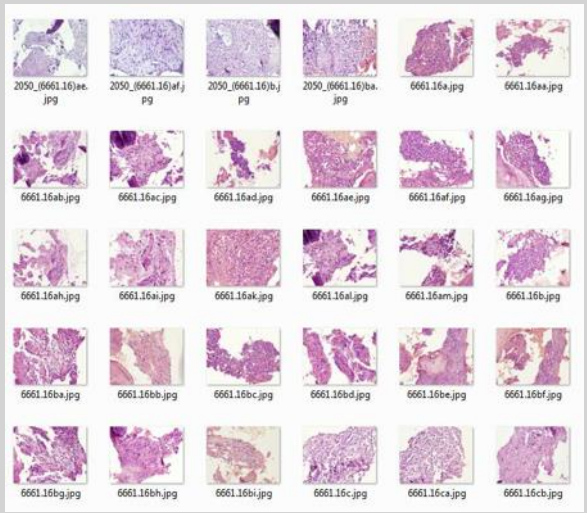
IBM Power AI Vision in oncology diagnostic







Data base for testing



In May 2018, specialists from IBM Russia, together with National Medical Research Center of Traumatology and Orthopedics named by N.N. Priorov, initiated a pilot project:

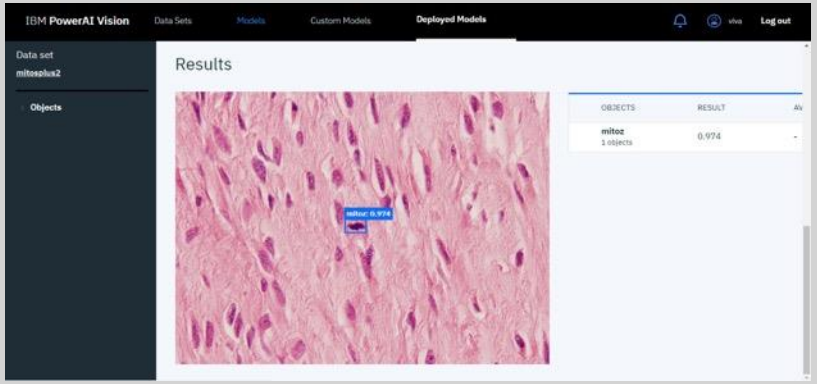
“The AI vision in Diagnosis of bone pathology“

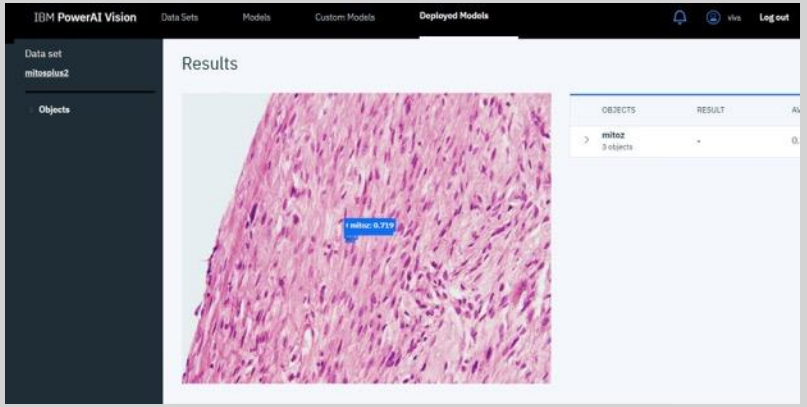
Up to 2019, we create model witch can find atypia mitoses in histologic slides and make pre-medical diagnostic in bone pathology.
Object marking with expert!

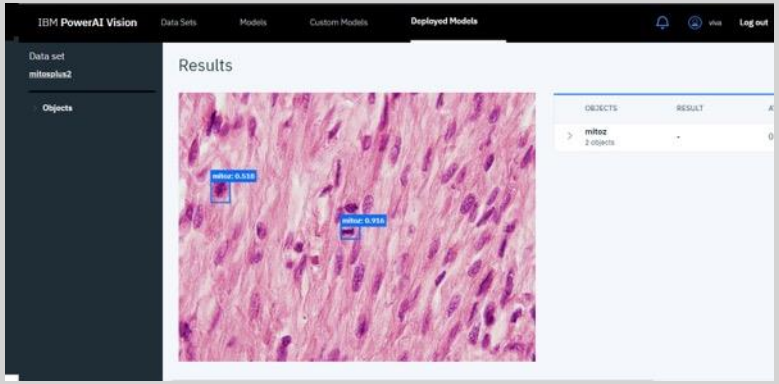
Oncology diagnostic – validation results

What is done:

About 1,500 histological images were used and the first in the world model for finding cells with atypia (atypia mitoses) was created.

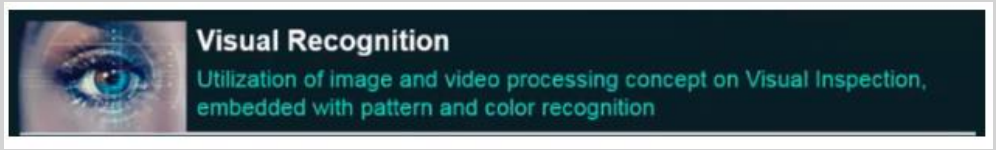






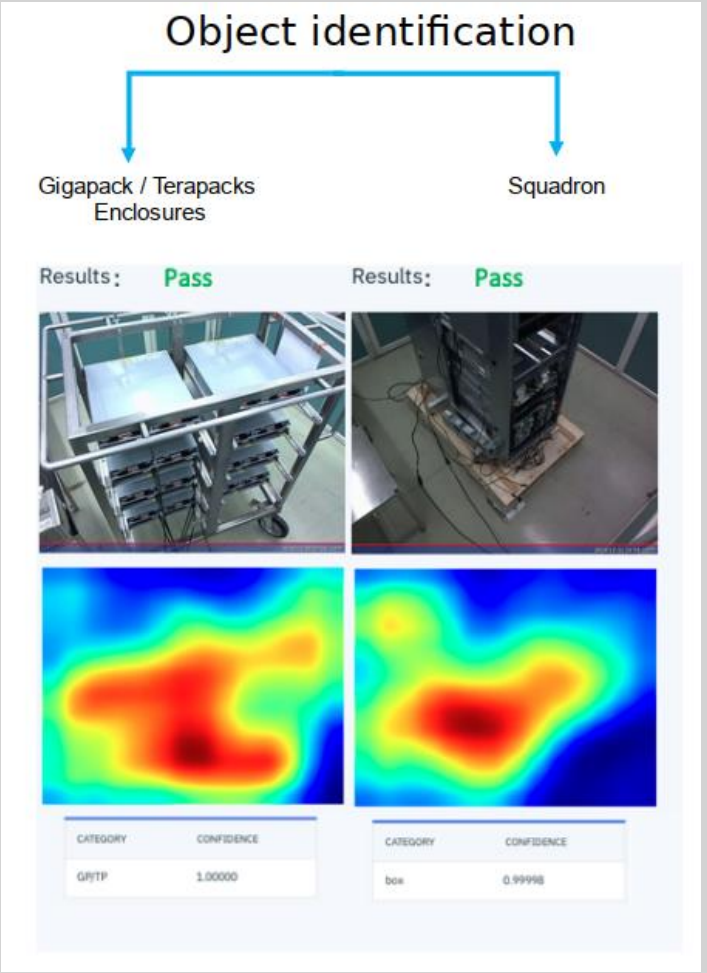
IBM Power AI Vision for DS8000 HIPOT test in manufacturing

The engineering team has implemented an automated visual recognition tool as part of the mfg test process to ensure safety and quality goals when executing Hi-Potential and Ground Continuity Test



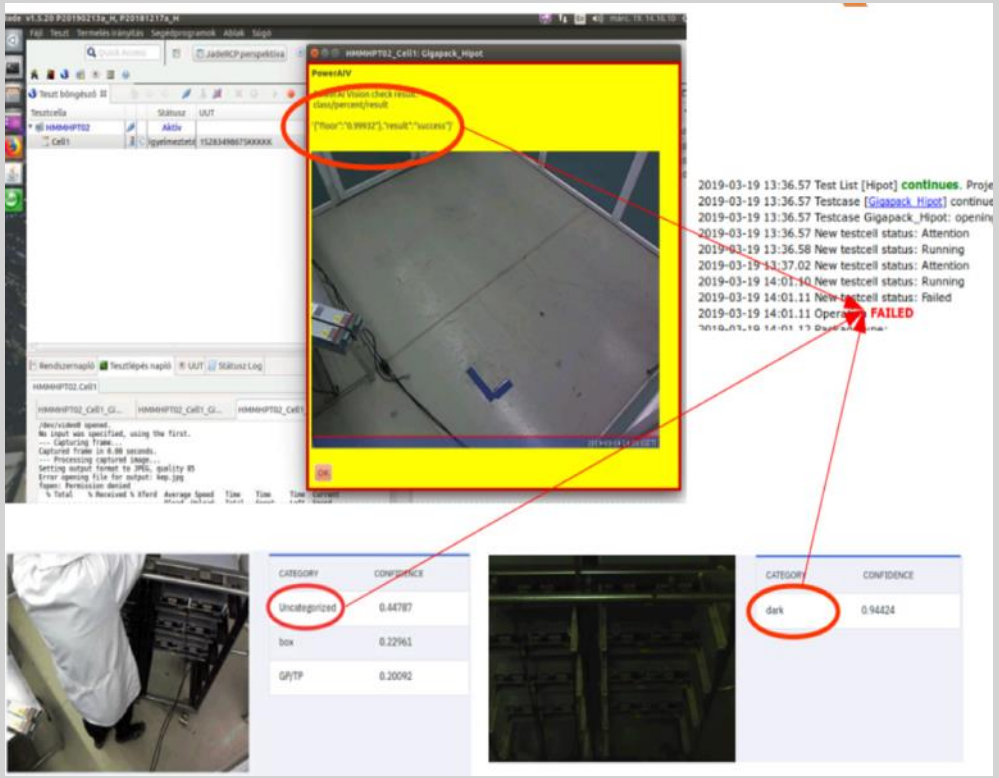
During the Ground Continuity and Hipot test the safety is very important because of the present high voltages and to avoid the electric shocks.

Testing shall be performed only when the qualified operator performing the test is outside of the test area.



IBM Power AI Vision for DS8000
HIPOT test in manufacturing – how it works

Based on the evaluated results, the test will fail if the environment doesn't meet the required criteria's

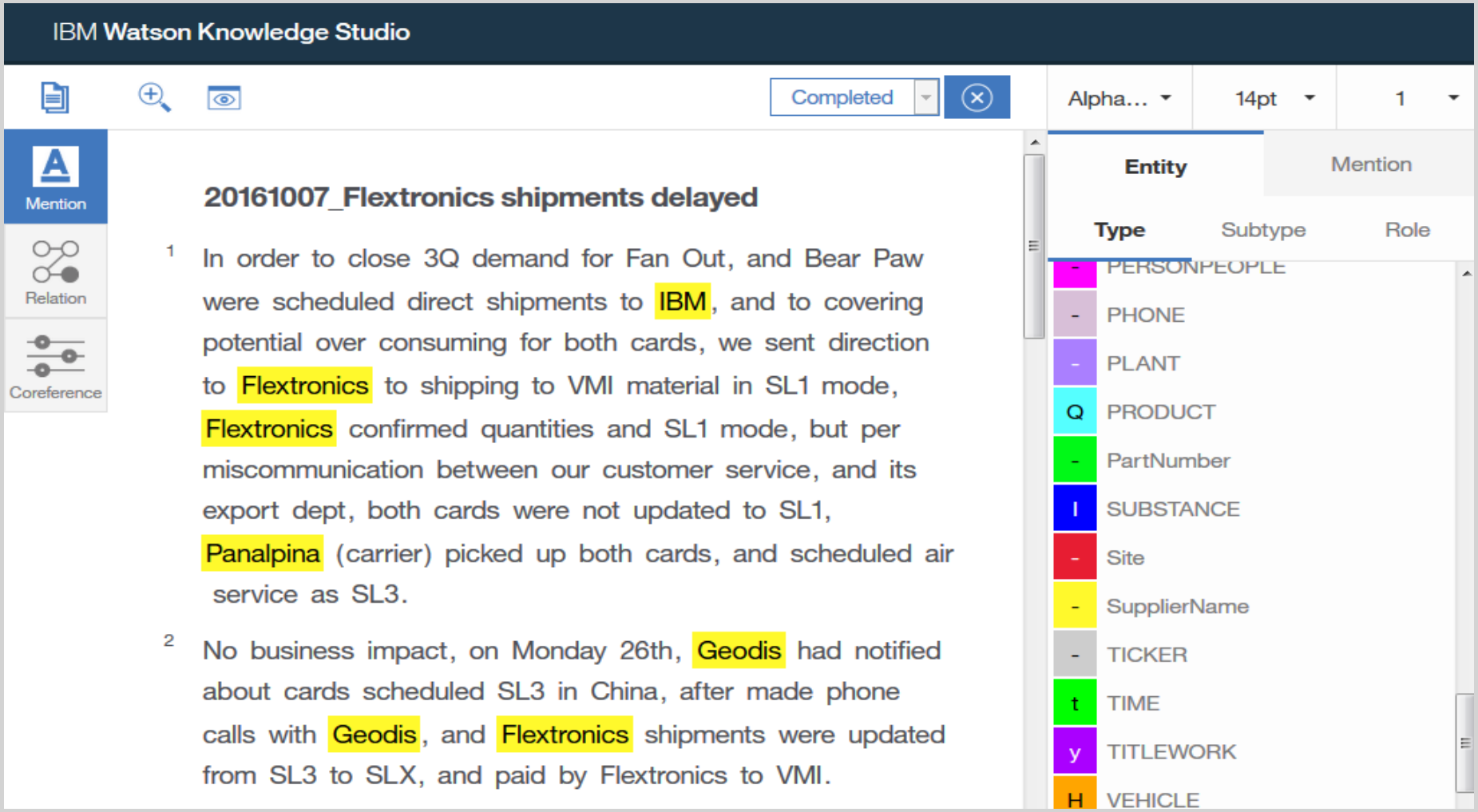


All of this has been implemented into our legacy cross brand test environment **JADE**

Hardware: IBM Power System AC922 (Model 8335-GTW)

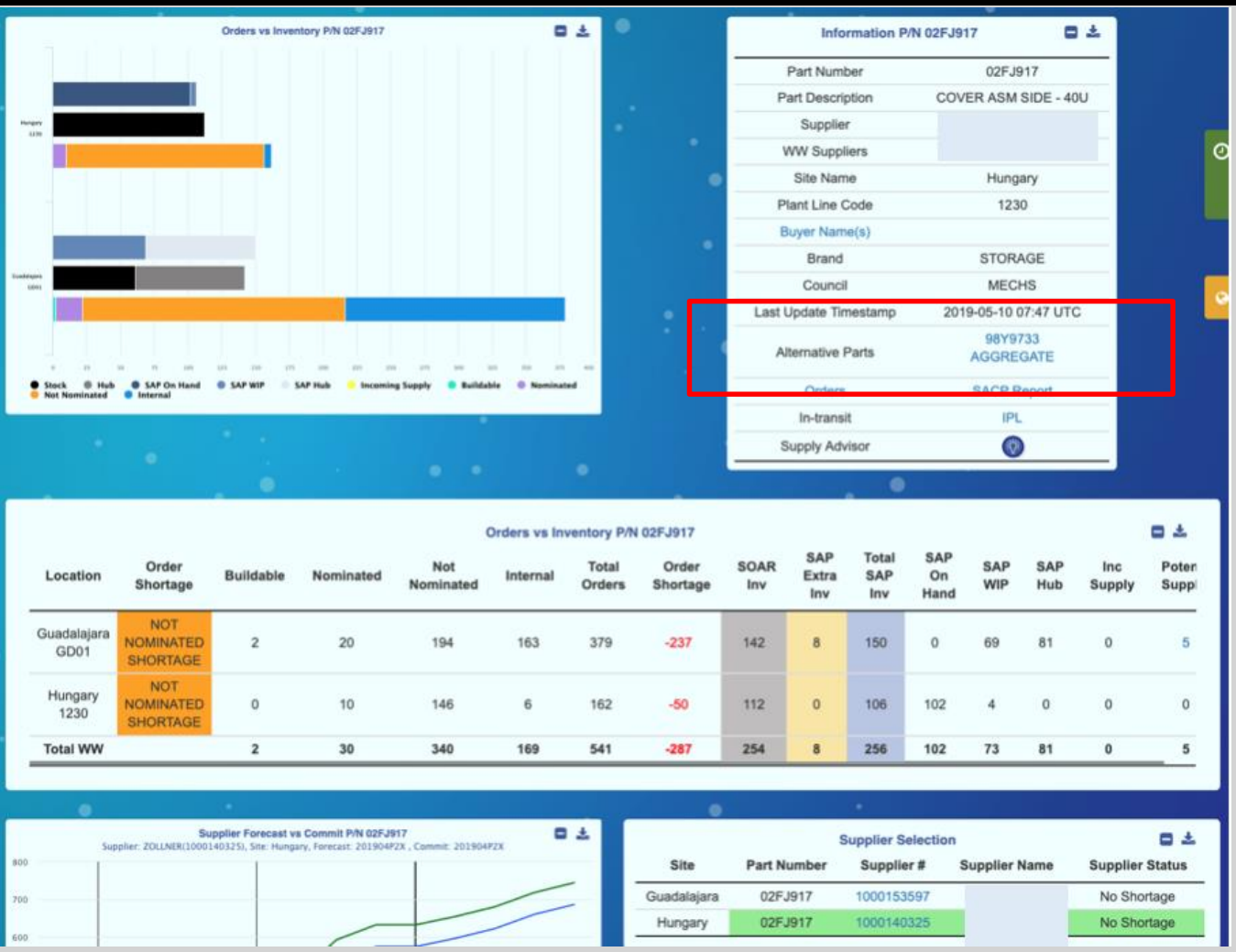
Software: IBM Power AI Vision (Version 1.1.2)

IBM Watson Knowledge Studio for Natural Language understanding



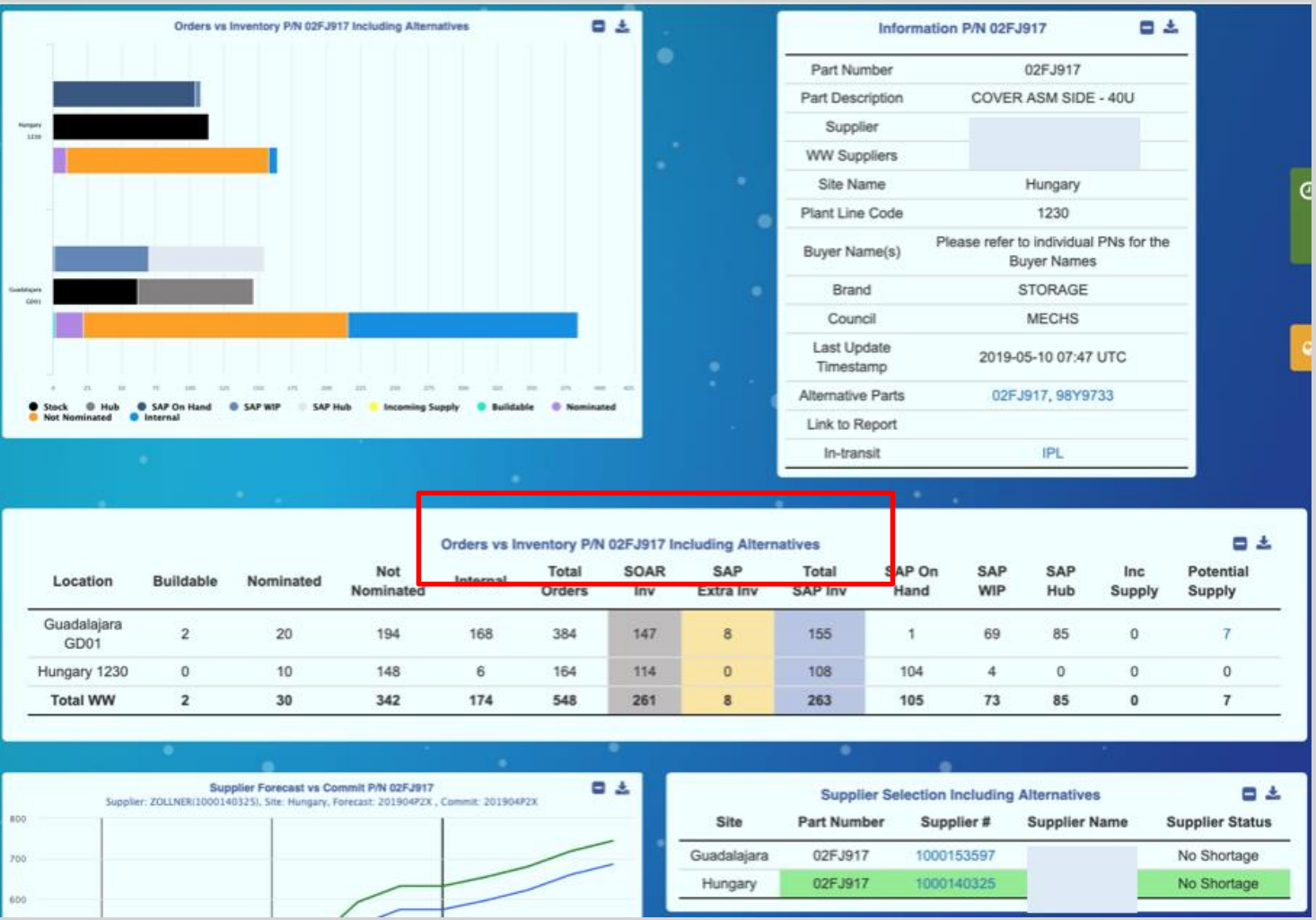
document understanding can be trained to Watson Knowledge Studio to get insights into data and integrate the gained knowledge into

IBM Watson Knowledge Studio for Natural Language understanding – how we use



In our cognitive supply chain platform we utilize WKS to get instant info on alternate Part numbers what is defined in Engineering Change (EC) Notices. More than 100,000 ECs analyzed in a second and gives instant help to our supply chain experts w/o need to be able to understand ECs, having access to DB and spend time to find the most recent, relevant ECs.

IBM Watson Knowledge Studio for Natural Language understanding – how we use



Having such access saves hours to our supply chain professionals and can focus right away on problem resolution and limit/eliminate impact of supply disruptions.

WKS not only identified more known potential relations but **uncovered 7,000 unknown relationship** as well (e.g. FRU to FRU alternatives)

Thank you