LEXUNIT AI CASE STUDY #01: SzamlAI, the Intelligent Accountant

The Project:

Automated Segmenting of Printed Invoices For Smart Data Entry

The Problem:

Accountants spend an unnecessarily huge chunk of their work time with performing the low skill task of data entry.

Invoices, although largely digitized, still come in printed form, in huge quantities. The printed invoices can have very different shapes and sizes. This makes smart scanning impossible, the data is visually too diverse to automate the data entry process. Entering this data into the accounting software requires human labor.

This task does not seem like it needs special skills, but it still cannot be outsourced due to data security, privacy and quality assurance issues. For these reasons, it has to be done by the qualified professional.

We confirmed this problem through a small research. We asked 30 accountants about the time they spend with data entry, and a staggering 50% was the average of their working time spent on administrative tasks.

The Solution:

Through Natural Language Processing, we successfully trained a neural network model to identify all of the key information on the invoices, no matter what shapes, sizes and colors the invoices come in.

The software solution we created is able to analyze the scanned documents and identify every kind of data on the invoices. This means that the software can not only read the data itself, it also identifies the data type and saves it under the appropriate category. Data entry becomes an automated process where the accountant only needs to check the entries to make sure there are no mistakes and edit them, if needed.

Our Method:

Since invoices are vastly different, we need to identify the common qualities, which can help the software to come up with the correct solution after analyzing the image of the scanned invoice.

Invoices typically contain data categories like this:

Invoice ID ('SA2019-01')	Date of Performance ('02/15/2019')	Currency (HUF)
Net Amount ('1.000 HUF')	VAT Amount ('270 HUF')	Gross Amount ('1.270 HUF')

and many others.

The **relative location of the data** on the invoice itself is also a form of 'data': the software can track the relative locations and use them to come up with better ideas about what that certain string of numbers and letters might be.

We identified features like: location / type of number / format.

We came up with special features as well, like 'Is this number the sum of other, previously entered numbers?' (that would make it a good candidate for being Gross Amount).

Then, we created sequences of these feature data to teach the **neural network.**

To make it as realistic as possible, we took 50 real invoices, and we have built a synthetic dataset by digitally recreating thousands of 'dummy invoices' from the original 50, using randomized data. This huge batch of invoices successfully trained the neural network to recognize data types from new invoices with a good success rate.

The Result:

The end result is a system which can predict the type of every data element on any scanned or digital document with a certain probability. The system offers these records up for saving. The accountant can review the results and confirm or edit them, if necessary, with a click, practically decimating the amount of time required for data entry.