The Future of Data Entry
Robotic Process Automation in Oracle Apex and Beyond

Lecturer

Miljenko Vuković

Vuković INTELLIGENT SYSTEMS d.o.o.

Founder

miljenko.vukovic@intelligent-systems.hr

Introduction

Sure, using Apex we can efficiently develop forms for data entry, but is all this manual data entry really necessary?

Oracle Apex is:

„Oracle Application Express (APEX) is a low-code development platform that enables you to build scalable, secure enterprise apps, with world-class features, that can be deployed anywhere."

- It enables us to rapidly develop complex apps with forms, reports, data validation, business logic….

Introduction

- However, we often focus on digitalization of the whole business process except the first step – data entry

- On the other hand, sources of data are often structured:
  - Digital, structured documents
  - Spreadsheets from other departments
  - Web site data
  - Even data from other application when the integration of the two software solutions is not possible and/or is too expensive!
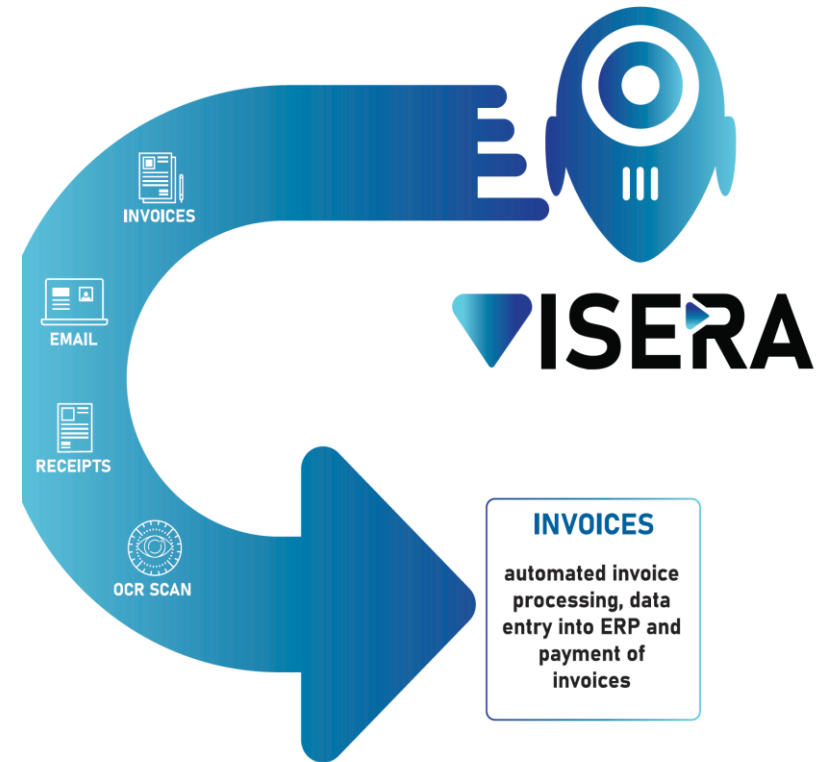
Obviously, data entry from structured sources could be automated. So, what are the solution(s)?

Robotic Process Automation (RPA)

Software for automating repetitive business processes by mimicking a human worker

Often referred to as "software robot"

- Non-invasive technology

- Reliability and Scalability

- Cost Reduction

- Accuracy and Consistency

RPA – Use Cases

Business Process Automation

- Client Reporting, Payment Processing, Data Cleaning, Employee Onboarding, Underwriting, Claims Handling, Compliance Reporting

Integration

- For integrations that are complex, expensive or too risky

Automated Testing

Example: Payroll Automation

- Used to be: manual entry of hours worked for each employee into ERP, preparation of legal reports and documents, sometimes even manual payment of each net salary, tax amount, contribution….

- Now: you just drop timesheet(s) in a shared folder and robot will do all the rest

Example: Payroll Automation

Example: Invoices

Example: Invoices

How is RPA affecting the Way We Work?

45% of all work
activities can be automated

$2 trillion dollars
could be saved in workforce spending

6-9 Months
on average ROI for an RPA project

94% of CEOs
that have incorporated RPA believe
that it has increased the productivity

By 2025
25% of jobs will be robotized

RPA Business Benefits

Government and regulatory compliance

Virtual workforce 24x7x365

Productivity increase

Reduction of human errors

Flexibility

Cost reduction

Scalability

RAPID IMPLEMENTATION AND ROI

REDUCES THE NUMBER OF FTES IN A PROCESS

How RPA Works?

- No significant change to the current IT infrastructure

- No changes to existing interfaces

- No need for a massive upfront investment

- Reduces swivel chair integration

Robotic Process Automation is expected to save companies **50-70% on labor costs** by making intelligent use of resources, near-zero error rates, improved compliance and reduced process cycle time, all of these through the implementation of machine learning and AI to develop/enhance procedures.
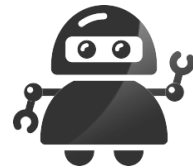
FOCUS ON ONLY JOBS HUMANS CAN DO

STRATEGY, CREATIVITY AND CONNECTING WITH PEOPLE
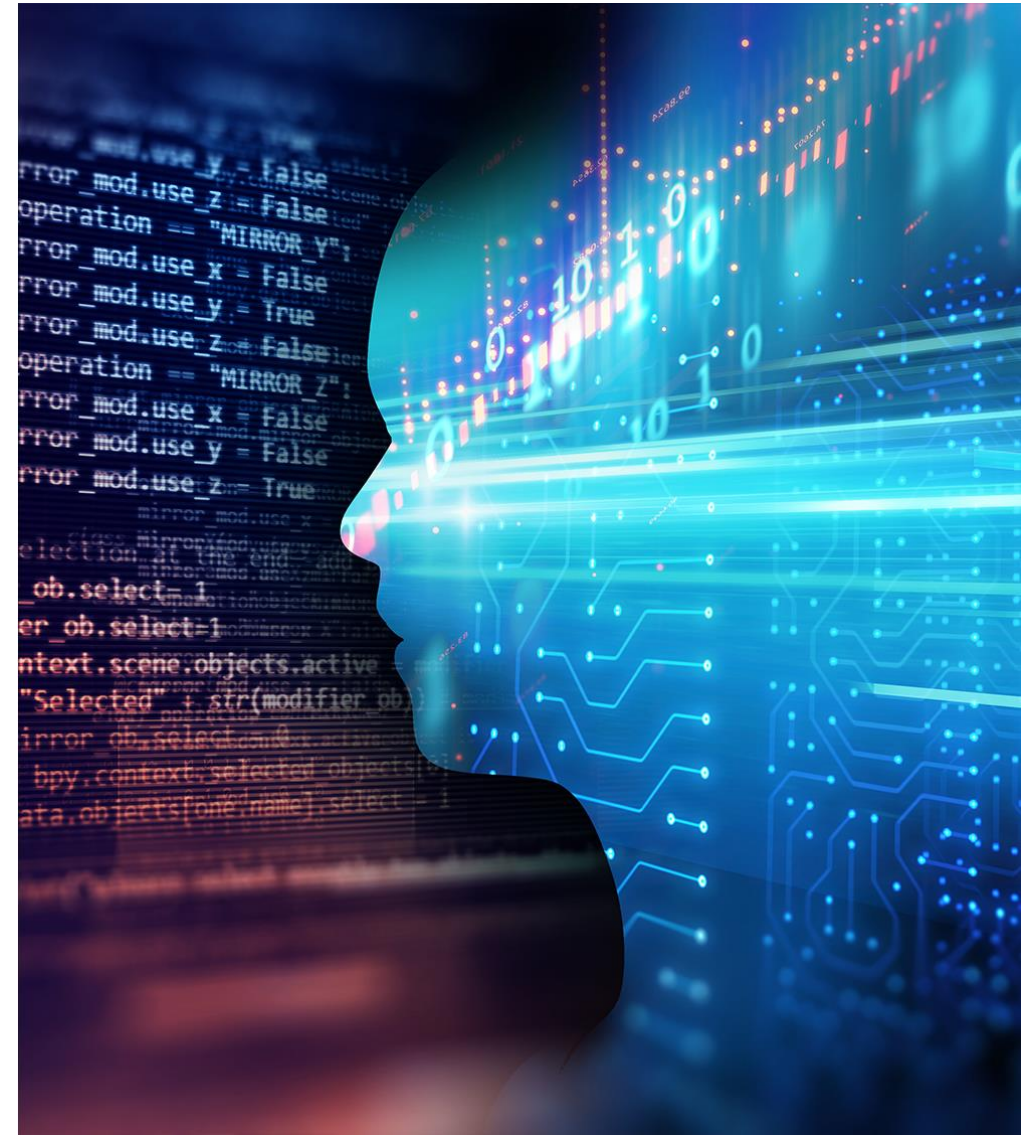
Processes Suitable for Automation

High Degree of Employee Involvement

Complex, Rules Based Tasks

High Quantity / Repetition

Don't deal with unstructured data

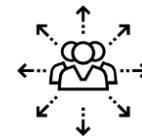Difficulty of Outsourcing

Two important aspects:
- We don't have to cover all different types of cases in the process
- We don't have to robotize the whole process

RPA – Cost-benefit Example
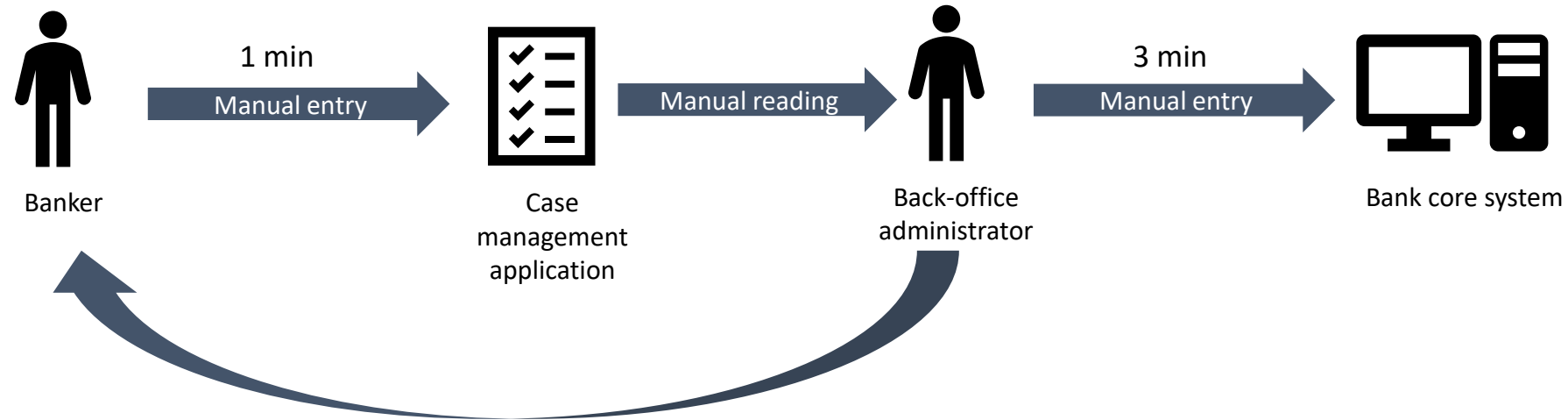
- 500 entries a day: 500*4min = 2000min ~ 33hrs = 4 man/days
- Issues:
  - Errors
  - Data quality
  - Speed
  - Employee on-boarding

Typical RPA deployment

ERP Files Web

Orchestrating server

Robots are typically installed on a standard workstation

Robot 1 .... Robot N

Do I have to use specialized RPA platform?

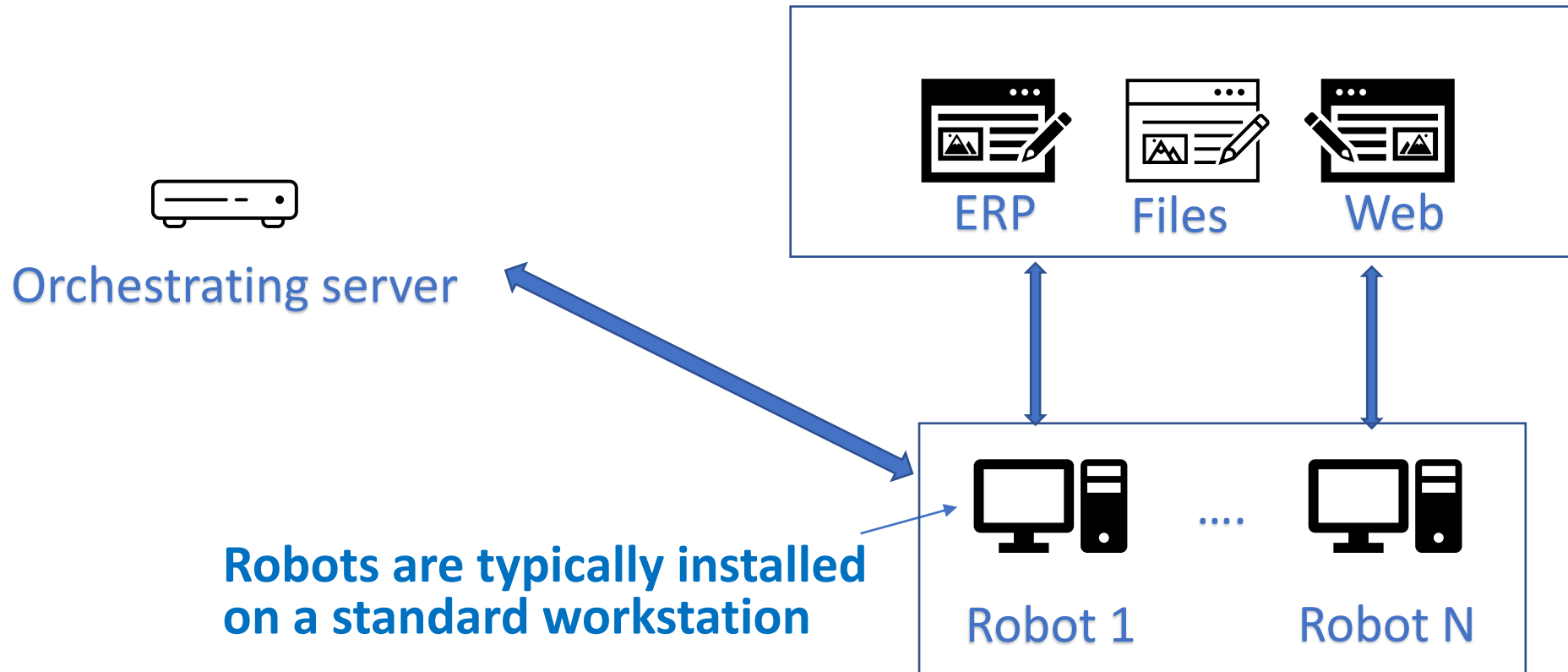- Not necessarily. Robots can be developed in any standard programming language, i.e. Python, Java, C#....

- In fact, our demo is developed in Python

Pros of specialized RPA platforms

- Pros of RPA platforms like UiPath, MS Power Automate, Robotiq.ai, G1ANT…
  - Standardized instructions („activities", „process steps") for clicking, typing into fields, drop down list manipulations…. – no need to program it from the scratch
  - Many platforms are also visual, so theoretically no coding skill is necessary
  - **Orchestration!** It can get really hard to synchronize many (possibly interdependent) robots on many machines which can be scheduled, triggered, user started/assisted….

Cons of specialized RPA platforms

- Cons:
  - Obviously, license costs
  - If you already have in house programming skills (Python, Java, C...), you will have to learn a new technology in the case of introduction of new RPA technology

Finally, an Apex example ☺

USE CASE:

- We run an association (user group? ☺)
- We enter all the membership application forms in Apex application in order to issue invoices
- Applications are usually recieved on email, in the pdf form downloaded from our web site
- We are currently happy with the web site, but our Apex app and web are NOT integrated
- We asked the student who developed the web if the integration is possible, but in the meantime he has migrated to Australia ☺

PDF Form example

Database table

APPLICATION_FORM

ID	INT	(PK)
NAME	VARCHAR2(40)	
SURNAME	VARCHAR2(40)	
ADDRESS	VARCHAR2(40)	
CITY	VARCHAR2(40)	
POSTAL_CODE	VARCHAR2(10)	
PERSONAL_TAX_NUMBER	VARCHAR2(40)	
DATE_OF_BIRTH	DATE	
MOBILE_PHONE_NO	VARCHAR2(40)	
EMAIL_ADDRESS	VARCHAR2(40)	
EMPLOYED_Y_N	CHAR(1)	
COMPANY_NAME	VARCHAR2(40)	
POSITION_IN_COMPANY	VARCHAR2(40)	
COMPANY_CORE_BUSINESS	VARCHAR2(40)	
COMPANY_NO_OF_EMPLOYEES	INT	

Apex form

Our current problems

- PDF applications sometimes get lost in the mailbox and never entered, resulting in lost revenue
- Lot of typos in applicants' names and contact data
- Typos result in members' complaints
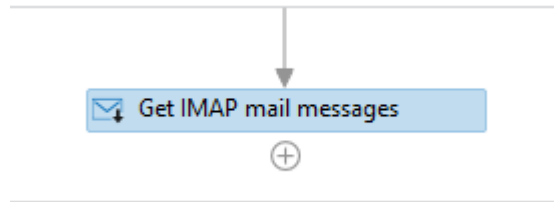- Embarassing situations on the conferences

Possible solutions

1. Complete redesign of the Web site in order to integrate it with database

OR

2. Development of a simple software robot to automate current business process

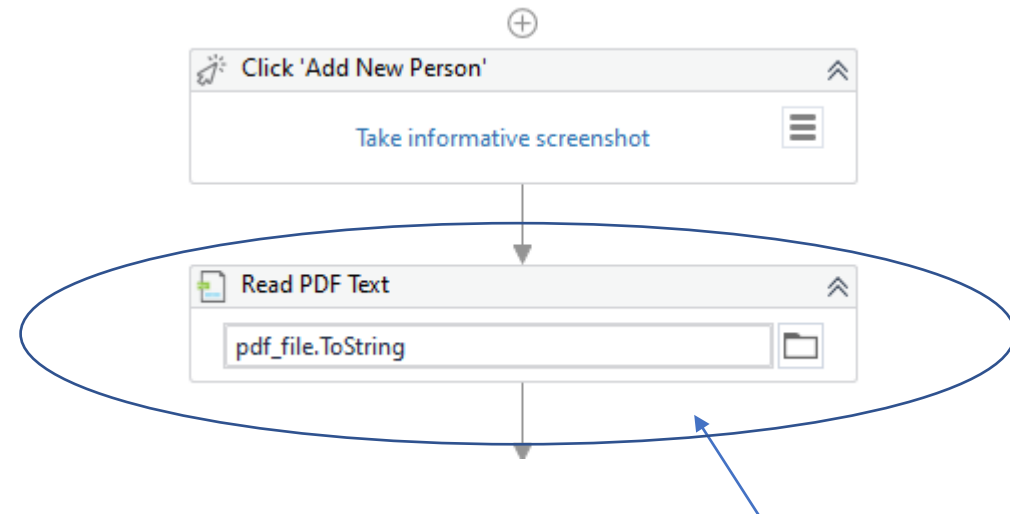# Robot development – check email for pdf-s

Robot development – reading the pdf file

```python
for filename in [f for f in filenames if '.pdf' in str(f)]:
    filename = str(os.path.join(dirpath, filename))
    filename_direct.append(filename)
```

Python example

Specialized RPA platform

Robot development – parsing data from text

Robot development – entering data in Apex

Robot development – why not directly to DB?

- Technically, sure it is possible
- Data validation – we don't want to reproduce it and then **maintain** in the robot the same logic already developed in Apex

Robot development – error handling
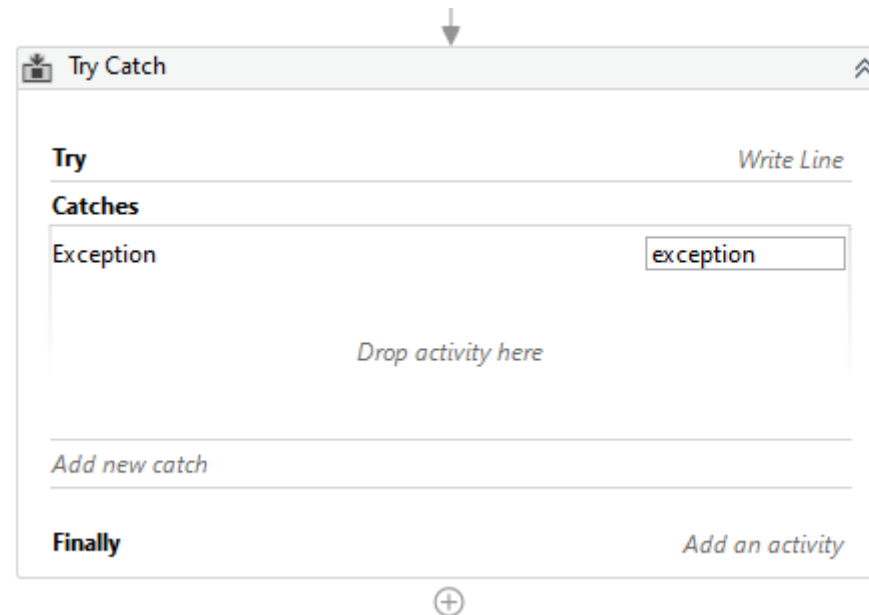
Can we see a demo?

NO!

Live demos can crash!

Powerpoint never (??) crashes! ☺

No really. Show us demo.

OK.

But I have a video just in case. ☺

Short demo

Demo - video

35
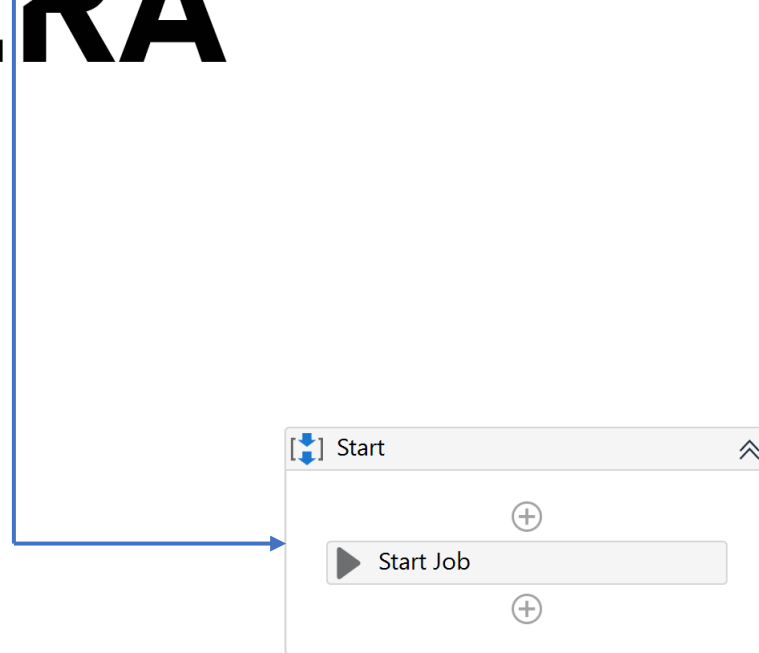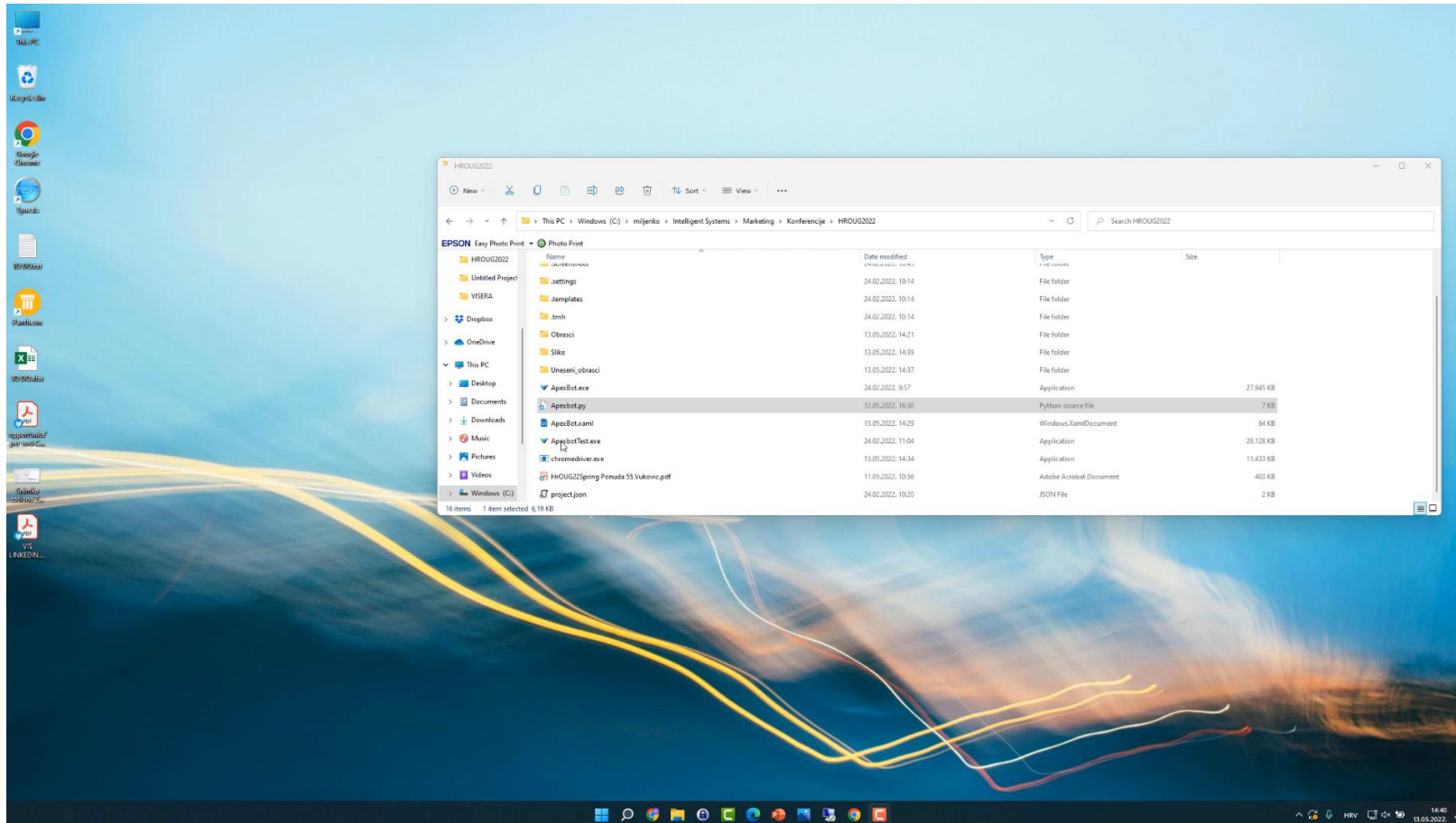
RPA Implementation Phases

1. Quick Process Scan
2. Pilot Project
3. RPA Roadmap Development
4. RPA Project
5. Upgrades & Maintainance

RPA Process Selection

- Rule Based Process
- Currently Requires Significant Workload and / or…
- …the Frequency and Cost of Human Errors is significant
- Changes in the Process are Relatively Rare
- Etc.

RPA Process Estimation

	Simple complexity	Medium complexity	High complexity
Description	• ~10-20 process steps • Simple validations and rules • Up to 2 systems involved	• ~25-40 process steps • Some validations and simple/ few exceptions • 3-5 systems involved	• ~45-60 process steps • Complex validations and multiple exceptions • 5-7 systems involved
Duration	5-10 days	10-30 days	20-40 days

Some Good Practices

1. Avoid „Big Bang" Approach

2. Each Process Has Only One „Owner"

3. Hand Over of Robots to Customer
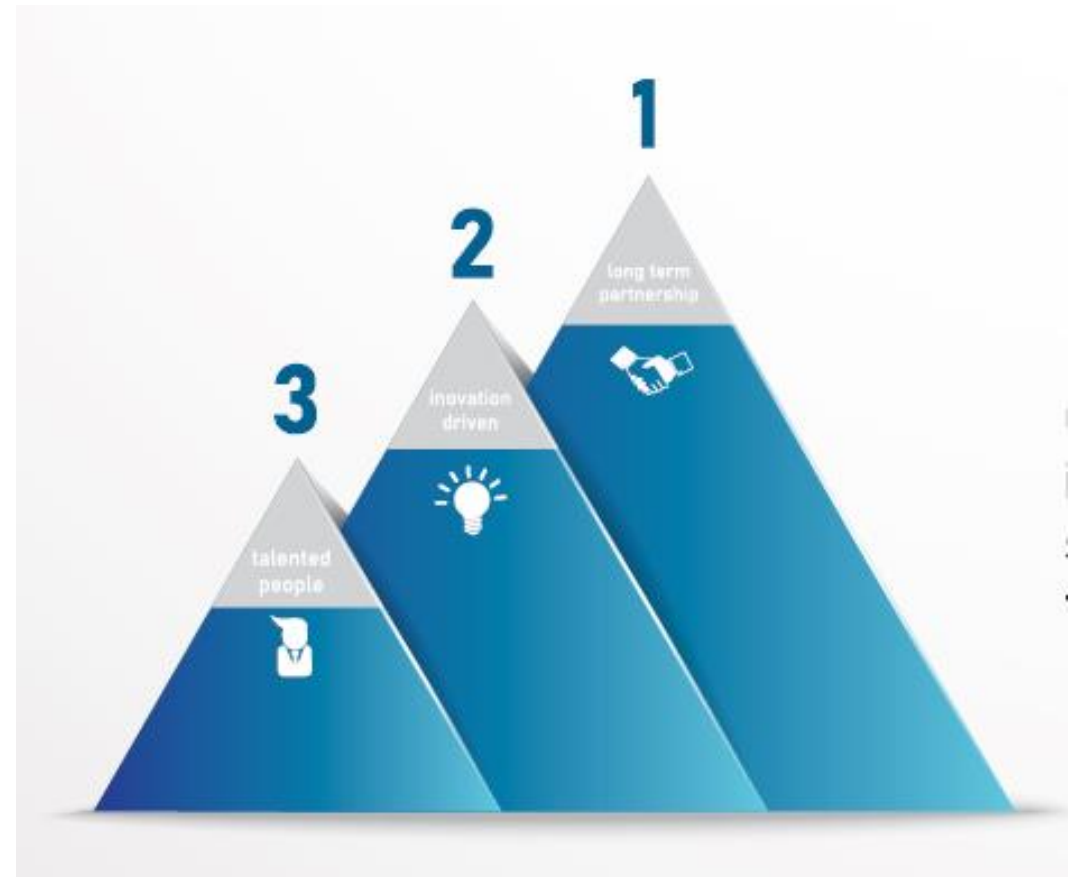
RPA Pricing Models - Services

1. Fixed Price
2. Time and Material
3. Hybrid Model

- It is possible to pay in installments to ensure project's immediate positive cash flow (in cases when monthly saving exceeds monthly installment)

Packaged RPA solutions

- I don't want to develop robots from scratch for standardized processes (ie. accounting). Are there any packaged RPA solutions already on the market?

- Sure there are. For example our own solution, VISERA.

VISERA – Robotic Accounting Automation

- Software which automates data entry for core accounting processes

VISERA - Modules

- Invoice Entry – Payable and Receivable

- Payroll Automation

- Bank Statements Entry and Reconciliations

- Digital Payment Order Generation for Invoices and Salaries

VISERA Invoice Processing

- „Zonal OCR" – software knows where to find a piece of data and in which format it will be

- Software recognizes a vendor via its tax number and uses vendor's specific invoice format

ZAGREBAČKI INOVACIJSKI CENTAR D.O.O.

Avenija Dubrovnik 15, 10000 Zagreb
TEL:01/3667-101
FAX:01/3667-102
ŽIRO RAČUN: HR8223600001102020550
MB: 080655731   OIB:53921712112

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Vuković Intelligent System d.o.o.

Horvaćanska cesta 170

10000 Zagreb

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RB	Opis proizvoda/usluge	Količina	JM	Cijena	Rabat	PDV	Iznos
1	Troškovi usluga inkubiranja 03/2019	20,00	m2	75,00	65%	25%	525,00

Slovima: šestopedesetšest KN dvadesetpet lp

Osnovica:	525,00
Rabat:	975,00
PDV:	131,25

Porezna tarifa	Osnovica	PDV
PDV 25%	525,00	131,25
	525,00	131,25

Za naplatu (KN): **656,25**

Questions ?