

# ***Information Technology in a local agriculture business***

# Business description

- The main activity of the business is agriculture. On the farm we grow mainly cereals (wheat, barley, oat, corn) and technical plants (rapeseed, soybeans, sunflower seeds).
- The total area of the farm is about 720 hectares. It is mainly a family business, set up and run by my father, under the direction of which I and my brother are working. In addition to family members, we also have 10 employees, mainly tractor operators and truck drivers.



Portret de fermier  
Invitati: Alin Zapodeanu  
Bogdan Aancutei  
Hălăucești - Iași



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# **Business sectors where IT cannot be lacking**

## **1. Databases**

Initially, during high school, I started transforming classical documents into digital formats, centralizing tax documents, creating databases of leases (about 1300 leases) and keeping track of all agricultural fields in use. (programs used: Word, Excel)

## **2. Accountancy**

Over time, I have taken over all the accounting records of the family business, as an associate member, being responsible for submitting monthly, quarterly and annual tax returns to the National Agency for Fiscal Administration, all being done online. (programs used: Smart PDF, SagaSoft)

**Tabel nominal cu cetățenii din comuna Mogoșești-Siret, satul Mogoșești-Siret ce au pământ în arendă în cadrul I.F. Zăpodeanu M. Anton în 2020-2021, plata arendei fiind de 900 kg grâu/ha sau 100 litri ulei/ha sau 700 lei/ha sau 200 kg zahăr/ha**

Nr. crt.	Nume și prenume	CNP	Semnătura	Supr. în arendă [ha]	Grâu	Ulei	Bani	Nr. contr.	Data contr.	Val. abilitat. e. con. tr. (ani)	Titlu propr.	Parcela	Nr. tar. la	Supr. în arendă [ha] de pe TP	Tarifa deumire populară
1.				1,37	1233	137	959	70	22.01.2013	10	94455	148/59	161	1,00 0,14 0,23	IAS poz. 8 - 1,00 (Ignat Gib.) Muncel - 0,14 - hataim 0,23 cu Nicolae
2.				0,90	810	90	630	745	14.11.2019	5	282116	212/191	212118	0,50 0,14 0,25	
3.				0,42	378	42	294	1070	15.09.2020	8	A1096		8	0,42	Tolocă
4.				1,00	900	100	700	71	22.01.2013	10	95823	Adev 83 20.08.1991	16	1,00	Obște st. Poz. 71
5.				0,54	486	54	378	73	22.01.2013	10	93979	236/2	23	0,54	Dealul' Morn
6.				0,50	450	50	350	74	22.01.2013	10	85470	150/1/23 A688/ 24.08.1991	17	0,50	Obște dr. poz. 23
7.				0,50	450	50	350	75	22.01.2013	10	94526	148/47	16	0,50	Obște st. IAS poz 8
8.				0,37	333	37	259	76	22.01.2013	10	94750 94464	150/1/2 148/2	17 16	0,12 0,25	Obște dr. 0,12 Obște st. IAS 0,43 (A1071 / 22.01.1992)
9.				0,32	288	32	224	77	22.01.2013	10	94430	150/1/50	17	0,32	Obște dr.
10.				0,32	288	32	224	898	09.03.2020	10	93946	150/2	17	0,32	Obște dr.
11.				1,04	936	104	728	78	22.01.2013	10	94695 94695	150/1/27	17 21 21	0,50 0,25 0,39	Obște dr. poz. 30 Siliște Cozmesti (lângă sat)
12.				0,5	450	50	350	8	8.11.2017	10	94616	168/6	18	0,50	Vădăm
13.				1,32	1188	132	924	79	22.01.2013	10	94043 94043	150/13 236/40	17 23	1,00 0,32	Obște dr. poz. 12 - 1,00 Dealul' Mornii - 0,32
14.				1,00	900	100	700	80	22.01.2013	10	93939	150/1	17	1,00	Obște dr. poz. 4

Centralizator culturi - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Nitro Pro 8

Clipboard Font Alignment Number Styles Cells

L35

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	RO258261	2021	IS	97438	HALAUCESTI	74	34	a	TA	201	FLOAREA SOARELUI	4,43	nu
2	RO258261	2021	IS	97438	HALAUCESTI	51	37	a	TA	201	FLOAREA SOARELUI	2,63	nu
3	RO258261	2021	IS	97438	HALAUCESTI	48	40	a	TA	201	FLOAREA SOARELUI	5,06	nu
4	RO258261	2021	IS	97438	HALAUCESTI	139	43	a	TA	201	FLOAREA SOARELUI	4,10	nu
5	RO258261	2021	IS	97438	HALAUCESTI	282	58	a	TA	201	FLOAREA SOARELUI	3,92	nu
6	RO258261	2021	IS	97438	HALAUCESTI	104	64	a	TA	201	FLOAREA SOARELUI	1,77	nu
7	RO258261	2021	IS	98168	MOGOSESTI-SIRET	258	76	a	TA	201	FLOAREA SOARELUI	12,66	nu
8	RO258261	2021	IS	98168	MOGOSESTI-SIRET	221	155	a	TA	201	FLOAREA SOARELUI	4,91	nu
9	RO258261	2021	IS	97438	HALAUCESTI	53	165	a	TA	201	FLOAREA SOARELUI	17,53	nu
10	RO258261	2021	IS	97438	HALAUCESTI	2223	172	a	TA	201	FLOAREA SOARELUI	3,62	nu
11	RO258261	2021	IS	97438	HALAUCESTI	2223	173	a	TA	201	FLOAREA SOARELUI	1,32	nu
12	RO258261	2021	IS	97438	HALAUCESTI	2323	184	a	TA	201	FLOAREA SOARELUI	11,55	nu
13	RO258261	2021	IS	98168	MOGOSESTI-SIRET	258	188	a	TA	201	FLOAREA SOARELUI	2,21	nu
14	RO258261	2021	IS	97438	HALAUCESTI	74	194	a	TA	201	FLOAREA SOARELUI	1,61	nu
15	RO258261	2021	IS	97438	HALAUCESTI	2223	206	a	TA	201	FLOAREA SOARELUI	1,97	nu
16	RO258261	2021	IS	98168	MOGOSESTI-SIRET	32	225	a	TA	201	FLOAREA SOARELUI	1,51	nu
17	RO258261	2021	IS	98168	MOGOSESTI-SIRET	258	267	a	TA	201	FLOAREA SOARELUI	0,71	nu
18													
19													
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Ready

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### 3. Measurement and digitization of the fields

Another task I have within the company is to measure and digitize all the plots of land in use. Only through accurate records of each crop, a competitive management can be achieved. To rich succes, we must know in real time the mechanized works performed on the fields, the quantity of fertilizers applied or the phytosanitary treatments of pests control for each plot. In order to accurately digitize the land I use a special GPS for measuring plots, TOPCON type, and with a software called Digiterra I manage to transfer data within the application provided by the Agency for Payments and Interventions in Agriculture (LPIS online), so that the declaration of cultivated areas with various cultures will be accurate and in line with reality.



- For example, due to accurate satellite identification and real-time declaration of cultivated areas, the software provided by the Agricultural Payments and Interventions Agency reports the overlaps with other farmers.



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**IPA-Online - Internet**  
 IF ZAPODEANU ANTON

**Digitizare parcele**





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Developed by German Twinning on IACS

## 4. Remote control

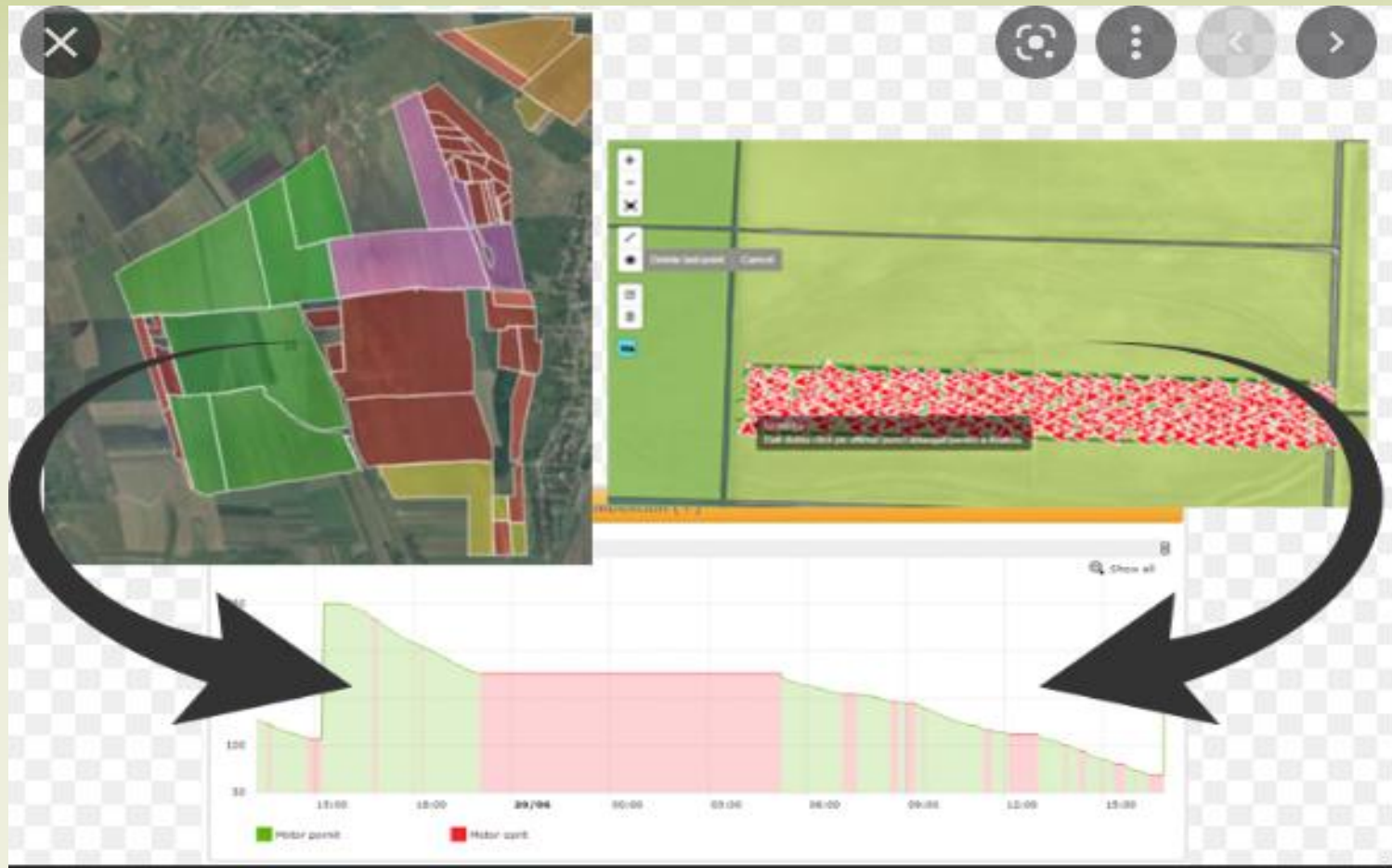
In order to track the field activity of the machines and equipments used, we have equipped them with GPS monitoring systems, so we can check in real time whether they are in motion, if they have technical problems, or if at the end of the day they have performed their tasks.

The screenshot displays the MapRoom web application interface. At the top, there is a navigation bar with buttons for 'Localizare harta', 'Masini', 'Activitate Aarii', 'Aarii', 'Cont', and 'Logout'. The main content area features a map of a rural region with several red star markers indicating tracked equipment. Three callout boxes provide details for specific markers: '1) JD 6620 IS12 Halaucesti', '3) IS-55-SUM', and '5) JD 6620 IS08 Mogosesti'. A sidebar on the left, titled 'Acces rapid', lists seven equipment entries with corresponding icons. A green status bar at the top of the map area indicates 'Auth successful' and 'Autozoom connected'. The map includes standard navigation controls like zoom in (+), zoom out (-), and a compass.

Equipment ID	Location
1) JD 6620 IS12	Halaucesti
3) IS-55-SUM	
5) JD 6620 IS08	Mogosesti



With the GPS tracking systems we manage to put in parallel the routes followed by the tractors, combines or trucks with the objectives drawn on that day. In this way, human and material resources are made more efficient.



# Remote control

By using the well-known TeamViewer software, I can weigh the loaded trucks arriving from the field remotely and at the same time print the tickets needed to transport the goods. In this way, with a smartphone, I can manage from anywhere the activities that I once could not do without the physical presence.

The screenshot displays a software interface for weighing trucks. It features two data entry tables at the top, a large central display showing the weight '61.95 t', and a table for generating tickets at the bottom. A red box highlights the 'Gravidade real' field in the second table, which contains the value '38.03 (Apex 1284.4 kg)'.

Dados pesagem 1ª máquina		Dados pesagem 2ª máquina	
Filme transport	0kg	Data leitura	4/25/14 PM
Nome usuário	<0000>	Data leitura	11.07.06
Número máquina	40000	Gravidade (ESQUE)	61.95
Data leitura	3/27/10 PM	Gravidade (LITILA)	39.61
Data leitura	23.05.06	Superfície	soft 3 (Dens: 1.20)
Gravidade (NTRABE)	22.34	Gravidade	1.20
UM	1	Gravidade real	38.03 (Apex 1284.4 kg)

61.95 t

Número ordem máquina	1	2	3
Filme transport	0kg		
Nome usuário	usuário		
Número máquina	40000		
Data leitura	3/27/10 PM		
Data leitura	23.05.06		
Gravidade (NTRABE)	22.34		

## 5. Technologicalization of agricultural machinery

By using the sensors on each agricultural equipment, the losses of energy and the damages in production are greatly reduced. From the guide sensors mounted on the seeders or on the self-propelled machines used to apply the phytosanitary treatments, to the adjustment and calibration sensors found on the harvesters, all of them compete in saving resources and obtaining high productions.



## **Digitalization is completely transforming agriculture. What seemed impossible in the past is a reality today**

We are talking in agriculture about autonomous or assisted driving in the car industry, so we are already very advanced. The possibility of operating agricultural machinery without drivers has also been created, although this is not yet permitted. GPS-guided tractors are already making considerable savings on farms due to the precision of their work. I also add the use of drones, a relatively new technology, then mapping the soil "from the air", a technique that needs improvement, but aerial crop surveillance works well.



## Should farmers also be IT specialists?

This is a key issue. We have these technologies, but they can't yet be put into practice on a large scale. Things will change soon as the machines become more and more easy to use, but study is needed. The data is processed by machines and computers, so the farmer only has to decide what he wants to do.



# How will agriculture look like in the future?



## A smart farm in action

**CLOUD STORAGE** means that growers can access all the information about their farm from any device and optimise every stage of the production process.

**DRONES** fly over fields, locating weeds, pathogens and sick animals; and collect data about the development of crops and their needs.

**SMART COLLARS** on cattle send information about their health and any other data that may be of interest, such as, for instance, when an animal is ready to give birth.

**SELF-DRIVING VEHICLES** sow with precision, and plant seeds at exactly the right depth and separation for the type of crop, maximising the output of the land.

**AUTOMATIC SYSTEMS** irrigate, fertilise and fumigate each plot depending on its individual needs, at exactly the right time and using the precise dosage.

**SMART CROP-SENSORS** collect data about moisture, lack of nutrients or the presence of pests to determine the need for irrigation, fertiliser or pesticides.

Source: Thales / Nesta.

## Without driver and with 680 HP under the hood!!!

The autonomous tractor presented by John Deere at Agritechnica 2019 (Hannover, Germany) meant much more than what it was (physically) - a cab, a fuel tank and an engine. The John Deere tractor was a bold statement by the American giant about the future of agriculture. And John Deere has a number of concepts about what that future might look like





*“We will never be grateful enough for the Earth that gave us EVERYTHING!”*

*Constantin Brancusi*