Smart production and industrial relations in Poland

Lisbon, 2017

Industry 4.0 (4th industrial revolution):

- global networks connecting factories, machines and other equipment should emerge
- autonomous data exchange between devices in networks, where the databases and devices can control themselves without human supervision
- all products and parts during production should be “intelligent”
- network devices and products under manufacturing processes should be connected

4. Automatization and flexible machines

Fully automatized, self tuning factories, with people controlling data and maintenance

5. Autonomization

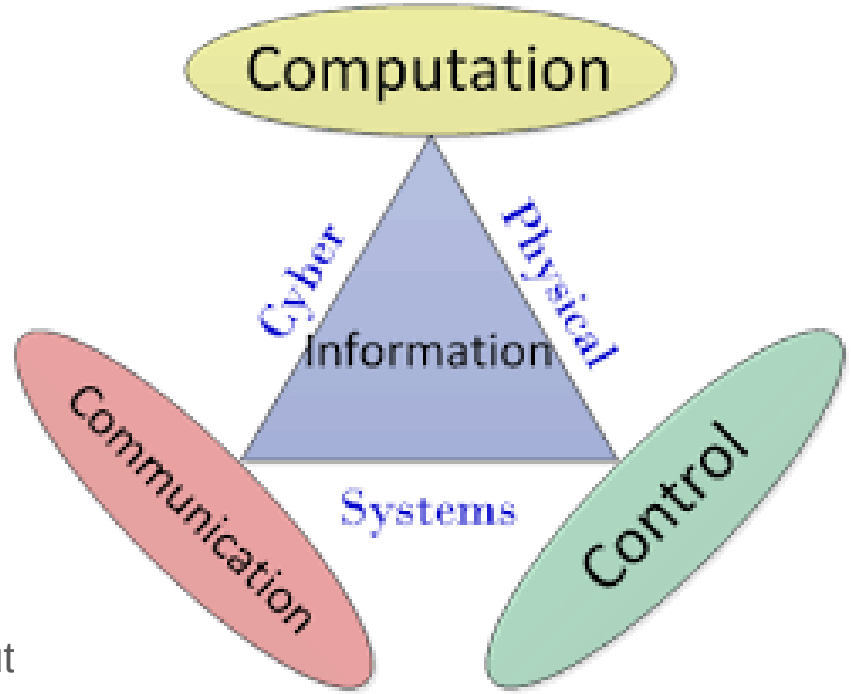
Decentralizing the system management

6. Collaborative entrepreneurship

Boosting innovativeness and uncover know-how

7. Cyber-Physical Systems

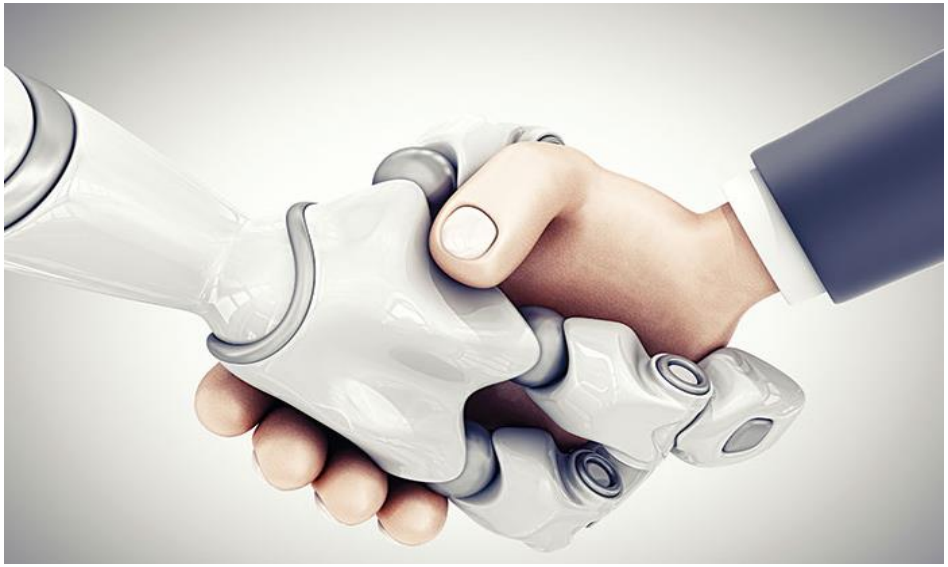
Network of interacting elements with physical input and output



The common European definition of smart robot presented in European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics :

The following characteristics of a smart robot have been identified:
– the acquisition of autonomy through sensors and/or by exchanging data with its environment (inter-connectivity) and the trading and analysing of those data;
– self-learning from experience and by interaction (optional criterion);
– at least a minor physical support;
– the adaptation of its behaviour and actions to the environment;
– absence of life in the biological sense;

Will machines replace the human work or will they help us to make the work more decent, safe and effective?



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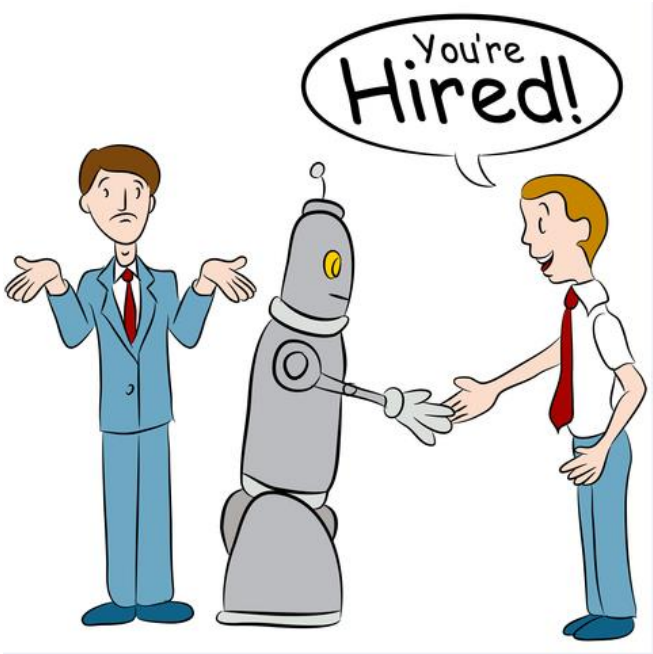


Digitalisation of the economy will create but also displace and destroy jobs.

Figure 2 **Jobs in the digital economy**

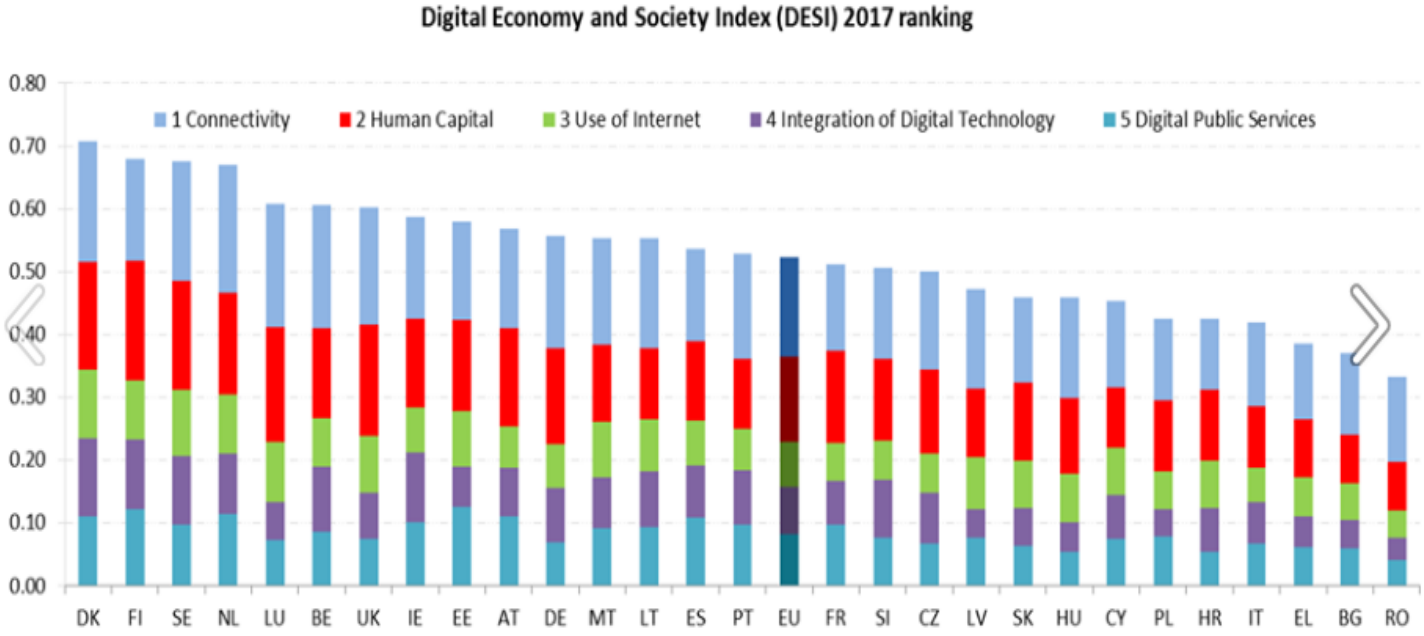
Jobs at greatest risk of automation/ digitalisation	Jobs at least risk of automation/ digitalisation	New jobs
Office work and clerical tasks	Education, arts and media	**'Top of the scale'**
Sales and commerce	Legal services	Data analysts, data miners, data architects
Transport, logistics	Management, human resources management	Software and application developers
Manufacturing industry	Business	Specialists in networking, artificial intelligence, etc.
Construction	Some aspects of financial services	Designers and producers of new intelligent machines, robots and 3D printers
Some aspects of financial services	Health service providers	Digital marketing and e-commerce specialists
Some types of services (translation, tax consultancy, etc.)	Computer workers, engineers and scientists	**'Bottom of the scale'**
	Some types of services (social work, hairdressing, beauty care, etc.)	Digital 'galley slaves' (data entry or filter workers) and other 'mechanical Turks' working on the digital platforms (see below)
		Uber drivers, casual odd-jobbing (repairs, home improvement, pet care, etc.) in the 'collaborative' economy

Source: Christophe Degryse (ETUI 2016) on the basis of data from Frey & Osborne, Ford, Valsamis, Irani, Head, Babinet

POLAND – general overview

- In „2017 Doing business report” created by World Bank, Poland was ranked 24th world economy
- Globalization challenge (political and economic transition; restructuring processes; green-field investments; marketing challenges)
- Smart factories (Poland has longstanding delay in high-tech automatics and robotics; old type of industrial performance)
- Low labour cost trap(this strategy was a success for times of transtion but it is not enough to transit further into high-tech economy)
- Germany as benchmark
- IT shortage (demand of big-data processing hardware, special class of software, high qualified IT specialists)
- Governmental support (Ministry of Digitalization, Responsible Growth Strategy)

Digital single market – European Commission's research - 2017



In comparison to 2016 Connectivity has improved. Businesses and public administrations are making more use of digital technologies. 79% of Europeans go online at least once a week. The data shows that the EU is making progress but the gap between top digital players and lower-performing countries is still too wide.

The structure of Polish production:

- chemicals, petroleum, pharmaceuticals and rubber – 25,4%
- food, beverages and tabacco – 16,62%
- metals – 14,19%
- electronics, electrics and machinery – 11,88%
- cars and transport – 10,29%
- wood, paper and printing – 8,70%
- textiles, apparel and leather – 3,43%
- Other – 9,49%

Industrial relations in Poland – key factors

-Strong asymetry in labour relations - weak representation of workers, especially in private sector (in 2016 39% of workers employed in the company with 9 workers or less where TUs cannot be established

-Low trade union density (7-8%), in companies employing more than 250 people 28% of eployees are unionised, in companies with less than 50 workers, only 6%

-The law enabling workers employed on the basis of civil law contracts and self propriators to join trade union still not fully implemented

-anti - union attitudes characterising private companies’ managers

Industrial relations in Poland – key factors

-low cooperation between trade union confederations at national level, caused maunly by their political affiliation and historical background

-at company level TUs cooperate more often

-employers organisations are active in public debate – underrepresentation of labour force

-number of collective agreements in companies is declining: 2010-130 agreements,2011-136 agreements,.2012-92,2013-109,2014-88. According to Labour Inspection 11% of workers are covered by collective agreements (1,8 million workers)

-strong need to develop smart industry in order to build competitiveness based on innovativeness, not on low cost of labour. In globalised world Poland, as the whole Europe needs to build strong industry which cannot be offshored to countries where the cost of production is lower. We need to invest in innovativeness and improve the commercialisation of the results of research.

-conflict of interests: environmental issues, development of green, renewable energy sources and representatives of extractive industries who are afraid of losing jobs by miners and other workers of traditional energetic industries

Barriers to meet the Industry 4.0 level in Poland, mentioned in Boston Consulting Group 2016 report:

- High investment needs
- Return of investment uncertainty
- Lack of domestic good practices
- Skilled staff shortage (brain drain, migration of skilled
- workforce)
- Data security concerns

Smart Production and industrial relations

- IT Conciousness (customizing plants to workers needs in the workplace)
- Technical awareness (automated machines disburden people physically, they are relevantly cheaper, so robots can substitute workers in the near future)
- Managerial changes (uknown results of working hand by hand of humans and robots; interdicsciplinary mind managerial style)

Key obstacles hampering the development of smart industry in Poland:

-low R&D expenditures – less than half of EU average (0,9% of GDP, EU-2,06%)

-low capacity of private business to invest in R&D (only 37,2% of R&D expenses incurred by business sector (EU average – 63%)

-low degree of commercialisation of research

-weak cooperation between acedemia and research centres and business

-only 15% of Polish companies are automated

-lack of production planning systems being a standard in Western EU

-only 16% of Polish factories implemented online data gathering systems (world average – 38%)

-competitiveness based on low cost production and social dumping – precarious work, black economy, low salaries -3 million factory workers still earn 65% less than their EU colleagues

Polish labour market and smart industry trends

Economic data show that Poland has just went ahead the adjustment to Smart Production with a slight delay. The distance towards Germany is still huge, but started to decline. Labour market has to be released from the low work cost strategy, and Government need to set the legal framework for innovations and R&D investments.

Gap between big enterprises and SMEs – according to ASTOR research done in 2016, 91% of big industrial factories at least partially implemented automation of production, 67% seems themselves to be fullly digitalised and ready for the smart production. 36% declare that their machine steering systems are integrated with the production software enough to automatically gather data. On the other hand, only 6% of SMEs digitalised their factories

Germany as a benchmark

-The percentage of industry’s contribution to GDP in Poland – 21%, in Germany – 23%.

-The average effectiveness of Polish workers is 3 times lesser than German, which is mostly caused by the lower investment in technologies. Polish workers spend 30% more time at work than their German colleagues, but approximately 15 times more autmated industry bolster the workers’ effectiveness in Germany over Poland.

Responsible Growth Strategy (2016)

The key objective: to transform itself from being contractor country to and originator country

5 pillars of the Strategy:

1. Reindustrailization
2. Development of Innovative Businesses
3. Financial aid for growth
4. Foreign expansion
5. Social and territorial development

Low labour cost trap

Politicians and businessmen believe in competitiveness based on combination of combination of high – skilled workforce and low – cost labour costs which caused duplex results:

❖Continuous GDP growth

❖Broad investment in hard infrastructure - foreign investment, greenfield, takeover, mergers etc.

❖ on the other hand more than 2 million dissatisfied workers including high-skilled and well educated workers decided to emigrate

That means strategy was succesful in the time of transition of Polish economy and now Polish society expects to get decent pay for their work. Poland doesn’t want to be a part of high-skilled low-salary assembly plant any more. It is high time for a pay rise and socially responsible investment.

Smart production in automotive sector

- increasing importance in Polish economy
- second biggest production sector
- 16 car and engine factories
- among biggest employers in Poland
- Solaris Bus & Coach - use space shuttle design software, one of the trendsetting companies in its industry. One of the biggest suppliers of buses in Poland and Germany

What should trade unions do in the face of digitalisation?

What should trade unions do in the face of digitalisation?

-to put efforts to organise atypicalworkers (crowdworkers, cloud-workers, freelancers, self-propriators etc)

-to promote lifelong learning and raise workers' awareness on the needs of redeployment

-to cooperate with policy making on adaptation of labour law to changes on a labour market

-to create the collective forms of action for crowdworkers

-to work on policies counteracting social dumping caused by digitalisation (competition between workers from countries with high- level and low -evel socia protection working on digital platforms)

-to find the way to organise atypical workers – IT specialists, crowdworkers and other professions which representatives considers themselves as individuals who do not need the support from trade unions

-to work on collective agreements at the levels of clusters, get involved in creation of law enabling the collective bargaining coverage of atypical workers

-to put up the fight for better policies enabling reconsiliation between work and private life, for example the right to disconnection after fixed working hours

-work on agreements ensuring access of workers to information concerning the company and mechanisms ensuring optimal employee involvement in decision making

What should trade unions do in the face of digitalisation?

-lobbing for minimum guaranteed income for everyone (profit generated by machines should be shared between the society, not be fully owned by the owners of capital)

-train their national and company-level leaders in ICT, the innovative methods of workers' organising

-reindustrialisation (putting into practice IndustriALL's manifesto „Put industry back to work"

-get involved in developing cooperation between business and academia centres in order to match the education with the labour market needs

-to develop in cooperation with employers the socially responsible methods of restructuring and change management

-to support the reduction of working hours

-to develop the new forms of social assistance for the workers definitely expelled from the labour market

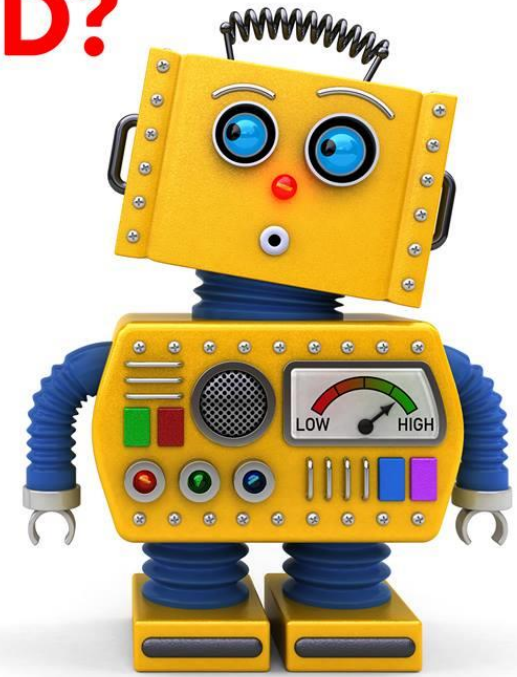
-to support development of EU – level labour inspection systems able to controlth working conditions of teleworkers, crwodworkers, platform workers, mobile workers etc.

-to create the EU – level digital mechanisms of control over the employers

SHOULD A ROBOT BE TAXED?

The idea presented last week by the Socialists and Democrats Group in the European parliament is based on two assumptions:
- Robots are taking people's jobs, therefore it's essential to support or retrain those workers put out of a job by robots;
-Human workers are taxed for their work and therefore why shouldn't robot be taxed too?

Taxing robots would help to gather funds to finance minimum guaranteed income and finance social protection for workers losing their jobs because of technological development.



Robots offer great possibilities, but they should remain at the service of humanity!

Inteligentna produkcja a relacje przemysłowe w Grupie FCA Poland

Lisbona 7 marca 2017

Postępujące wykorzystanie robotów i inteligentnej produkcji oznacza duże zmiany dla gospodarki, ale przede wszystkim dla zatrudnionych tych gałęziach przemysłu ludzi.

W polskim przemyśle stopień robotyzacji jest jeszcze bardzo niski, według Instytutu Badań nad Gospodarką Rynkową sięga 28 robotów na 10 tys. pracowników, przy średniej europejskiej wynoszącej 85 i światowej 69.

Jedynym sektorem przemysłu w Polsce, które nie odbiega od średniej europejskiej a wręcz go przewyższa do przemysł motoryzacyjny, gdzie na 10 tyś zatrudnionych mamy 131 robotów. Tuż za motoryzacją nadąża przemysł metalowy,


Liczba robotów w polskich firmach produkcyjnych, produkcja:
pojazdów samochodowych 4091
wyrobów z gumy i tworzyw sztucznych 1545
metalowych wyrobów gotowych 811
urządzeń elektrycznych 311
maszyn i urządzeń 281
komputerów, wyrobów elektronicznych i optycznych 235
artykułów spożywczych 227
wyrobów z pozostałych mineralnych surowców niemetalowych 216
metali 193
odzieży 119
Pozostałe działy przemysłowe 479
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W obszarze produkcji samochodów najlepszym przykładem jest wydział spawalni gdzie pracuje 800 robotów, dających możliwość wyprodukowania 1 nadwozia w 70 sekund, następnie lakiernia 80 robotów i montaż 30.

Bardzo ciekawie przedstawiają się dane dotyczące obróbek i montażu silników. I tak obróbka silnika SDE jest w 95 % a Twin Aier w 98 % zautomatyzowana – pracownik wyłącznie kontroluje proces produkcji,

Montaż SDE posiada 43 % stanowisk zautomatyzowanych, a Twin Air 61 %

Postęp charakteryzujący się robotyzacją produkcji w obliczu zagrożeń niosących likwidacje prostych miejsc pracy, ma swoje również korzystne oblicze, kiedy to dotychczasowa ciężka i uciążliwa praca człowieka jest zstępowana automatem.

Wówczas następuje likwidacja stanowisk pracy wymagających nadmiernego wysiłku fizycznego, ale przybywa stanowisk pracy lżejszych, wymagających od zatrudnionego odpowiednich kwalifikacji.

Wzrost ilości tych stanowisk pracy będzie wymagał od pracownika przekwalifikowania się lub uzupełniania swoich umiejętności tak, aby nie przegrał on z inteligentną produkcją.

Na pytanie - Czy roboty powiązane z inteligentną produkcją zastąpią pracę człowieka?

Czasami odnosi się takie wrażanie, że mogą zastąpić, ale bardziej będą wpierać proces produkcyjny, ponieważ w wielu przypadkach w sektorze motoryzacji nie ma możliwości zastąpienia pacy człowieka a również koszt zakupu i zastosowania automatu/robota jest po prostu nieekonomiczny nawet w przypadku produkcji seryjnej i powtarzalnej.

Można wydrukować karoserię samochodu na drukarce 3d - ale ktoś musi to zmontować

Karoseria z drukarki 3 d ?

Trójkołowy pojazd o aerodynamicznym, nowoczesnym designie wyposażony w hybrydowy energooszczędny silnik – tak można określić projekt nowego Urbee 2. Jednak najbardziej zaskakującym faktem jest, że pojazd ma powstać techniką…druku 3D. Czy w taki sposób będą produkowane samochody przyszłości?

Urbee 2 to owoc współpracy przedsiębiorstw KOR EcoLogic, On Demand i Stratsys 3D. Ich celem jest wprowadzenie za dwa lata„pełnoprawnego" drukowanego samochodu na drogi. Druga, ulepszona wersja znacznie będzie różnić się od pierwszego modelu zademonstrowanego w 2010 roku.

Urbee 2 jest hydrydą wykorzystującą zarówno silnik spalinowy jak i silniki elektryczne. Te drugie napędzają przednie koła i dają moc 8-16KM. Silniki elektryczne posłużą głównie do jazdy po mieście (pozwalając przejechać ok. 64km bez potrzeby ładowania). Natomiast na autostradach Urbee 2 skorzysta ze standardowego napędu. Maksymalna prędkość pojazdu ma wynieść 110km/h.

W skład projektu wchodzi ponad 50 elementów, które muszą być wydrukowane w technologii 3D. To wymaga około 2500 godzin pracy systemów Fortus 900mc. „W Urbee 2 więcej niż połowa samochodu będzie wydrukowana w 3D" – mówi Jim Kor, właściciel i główny projektant KOR EcoLogic.

Na razie największą przeszkodą są finanse. Projekt wymaga wkładu 3mln dolarów do dalszego rozwoju. Sam trend wydaje się ciekawy – po domach przyszłości drukowanych w 3D może nadejść czas również na drukowane auta.

W Chicago zaprezentowano pierwszy samochód z licznymi elementami pochodzącymi z drukarki 3D. Jego produkcja trwała 3 dni, a jej całkowity koszt wyniósł 18 tys. dolarów. Jazdy próbne zakończyły się sukcesem.

Samochód nazywa się Strati, co po włosku oznacza "warstwy". Elementy mechaniczne, takie jak silnik, zawieszenie, przewody, szyby czy felgi, wyprodukowano metodami tradycyjnymi - wykorzystano tu m.in. części z Renault Twizy.

Gigantycznej drukarki 3D pochodzi natomiast podwozie nadwozie. Wykonano je z plastiku (ABS) wzmacnianego włóknem węglowym (udział od 13 do 20 proc.).

Sam druk zajął 44 godziny, kolejną dobę pochłonęło wyrównywanie krawędzi. Według projektantów proces ten w dalszej przyszłości można skrócić nawet do 12 godzin.

Do napędu Strati służy napęd elektryczny, pozwalający rozpędzić się do prędkości 60 km/h i jednorazowo pokonać bez ładowania dystans około 200 km.

Dziękuje za uwagę

Lisbona 7 marca 2017