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Team #R0 044



Circuit Dealerz

1. TEAM

Getting to know us



Local values and needs

Suceava is a city considered to be the county capital (a county in Romania is the administrative territorial unit of a large area, and the country has 40 counties). It has approximately 120,000 inhabitants. The county's main asset is its people, raised in respect for their ancestors, for the millennia-old history of these places and for the future of their children. There is an entire plethora of famous people connected to science and culture who were born and raised in Suceava. The local heritage includes unspoiled forested areas which need to be protected, extremely beautiful scenery characteristic to hilly and mountainous regions, historical and religious artifacts which are part of the UNESCO heritage (monasteries with exterior paintings, in perfect condition and unique all around Europe), unique elements of folklore etc.

Over the centuries the city of Suceava has been the cradle of mixing diverse cultures, among which the Roman one, but also the Armenian, the Jewish, the Polish and the Ukrainian ones. The area is rich in sites which stand proof of this (4 Armenian churches, a synagogue etc.) and which are cherished and well preserved.

The city is important due to its geographical position at the crossroads of highways which cross Romania south to north and east to west, and due to the fact that it uses local resources, some of them not fully exploited. The county exploits high quality mineral springs, wood, non-ferrous metals, coal, uranium etc. Tourism is well developed in the form of eco-tourism.

The city houses "Stefan cel Mare" University which, along humanistic faculties and colleges, includes others such as "Computer Science and Electrical Engineering" or "Mechanical Engineering", which are top faculties in Romania for a number of reasons. One of them is the number of patented inventions- 153, which place the Computer Science and Electrical Engineering faculty on the first place in Romania in this field. The University is the scientific heart of the region, with all prestigious local developers signing contracts with the institution.

Apart from all these, in 2014 the University supported the organization of the 8th edition of the International Olympiad for Astronomy and Astrophysics, which was a real success due to its top-quality organization, aided by many of students from our college.

Suceava is also the venue of a national contest for inventions and innovations, ROSEF, which is entitled to qualify Romania's representatives to 4 national contests of the kind, 2 held in Europe and the other 2 in the USA. Many of the students from our college qualify for international contests via the eligibility provided by ROSEF.



Values of "Petru Rares" National College Suceava - the school that the members of CIRCUIT DEALERZ attend

"Petru Rares" National College is the biggest theoretical college in the county of Suceava, with 1,200 students attending. The characteristic of our college is the fact that all the profiles and specializations are different from one another, in order to cater for the diversity of requests coming from middle school students and their parents. Thus, the college includes humanistic profiles specializing in Philology and Social Studies, and Scientific profiles specializing in Mathematics-Information technology and Natural Sciences. Many of these function as bilingual classes in English, French and German.

All the graduates from our college further their education in the country or abroad. The Domains our graduates choose are very different, but the vast majority opt for engineering and IT.

Another characteristic feature of our college is the way in which we combine the formal, curricular activity with informal, extracurricular activities. There are 10 clubs in activity, of which the inventions and innovations club and the scientific club NEXUS have been activating for over 10 years. The robotics club is actually an offspring of the inventions club. The multitude and variety of the educational informal activities in our college is one of the reasons for which many middle school students choose to come to our college.

In Romania there is a law of the quality of education provided by educational institutions. According to this law, schools are assessed periodically. For example, "Petru Rares" National College was graded as EXCELLENT after the latest evaluation of quality in what extracurricular activities are concerned. We achieved the same grade for educational research (both teachers and students). This grade is quite rarely achieved in Romania, as it implies the existence of innovation in the respective field.

Yet another characteristic of our college is the fact that the teachers conceive and offer a wide variety of optional courses, meant to broaden the students' horizons and, in particular, to ease the development of cross-curricular abilities. For example, an optional course, based on the structure of educational research, was "Science between hazard and catastrophe", in which the students and teachers proved that the developments of current technology are in relative proportion with an increase in the vulnerability of the area, just like 100 years ago. This theme included a sub-theme,



"Virus and Viruses", in which they proved that the computer virus has the same features as the live one, with the exception of the same way of transmission, at least for the moment. The final products of this course competed on a national level and received a prize in the form of a multi-touch laboratory in which the students, especially those studying IT, can produce educational software.

The college has been running exchange programmes with European countries through Erasmus projects. These projects contribute to an increased broadening of our students to the world, helping them to become more flexible and to interact with students their age from different parts of Europe. The current themes we are working on right now, as part of different projects, are as follows:

I. The development of citizenship education via all the school subjects and extracurricular activities- possibly with European funding. As a result of this project:

- we will raise awareness of social issues, especially involvement in support for needy people, in finding solutions for risk-prone people, etc.
- we will help increase the number of young people involved in activities meant to support the economic growth of the region (as a factor of local and regional stability)
- there will be an increase in the number of activists for NGOs and political organizations etc.
- there will be an increase in the level of education and culture of the citizens, and in the way they respond to educational and cultural events
- there will be an improvement of the young people's attitude towards their birthplace
- there will be increased interest in the area from foreign investors (who regularly focus on a sense of local community).

2. Scientific and technical education through innovation activities- a project which combines scientific and innovation abilities- possibly with European funding. The project aims at combating the almost general fear of speedy technological advances/ its harmful effect on humanity, and it enhances confidence in the individual and collective inventiveness.

3. Education through the man-nature connection- a project which is under development annually, started from the concept of durable development, with a focus on the educational side. So far, as part of this project, there has been built an open-air classroom including an educational gazebo, a therapeutic lane, a herb garden, and a weather station. All these are located in the college park and can be accessed by a large audience. The next stages include activities to be conducted in the area, logistic operations and the expertise of those who are going to use them- possibly with European funding.



The college is currently facing a major problem, that of learning space. There is a group of laboratories and a research center under construction, but construction was stopped due to lack of funds. When the building is finished, the educational process- in terms of facilities- will definitely improve.

The future group of laboratories and the glass pyramid lighting system of the research center.





A little history of our team

Team Impulsive of CNPR, who participated in FTC, qualified to St.Louise in America. Once they returned from FTC, they made a presentation to the participants in the school's auditorium. Even though, they did not win, they still had passion in their eyes and felt like their efforts paid off. That made everyone in the room feel like an ant in comparison, but that difference lit a fire in our hearts and made some of us want to follow in their footsteps.

The majority of the members decided they were unable to continue with robotics because they were in their last year of high school and they were preparing for Bacalaureat, a national exam that qualifies you for superior education and verifies that you successfully graduated high school. Only 2 members of the team decided to participate in this year's FTC, because they were just in ninth grade and decided it was necessary for them to continue.

For a more transparent selection of the new members of the robotics team, the principal of the school posted on the college's website an announcement in which the various conditions for participation were mentioned (e.g. the knowledge in domains such as: physics, informatics, electronics, robotics and related activities and achievements)

04
OCT

ANUNȚ DE SELECȚIE CLUBUL DE ROBOTICĂ

În vederea participării echipei de robotică a CN "Petru Rares" la competiția națională FIRST, respectiv la etapa internațională, clubul de robotică al colegiului organizează selecția de noi membri. Doritorii, elevi ai colegiului, aflați în clasele 7-12, pot depune cerere la secretariat până în data de 6 octombrie. În cerere se vor specifica abilitățile pe care le detin în domeniile: fizică, informatică, electronică, robotică etc. și ce activități au derulat deja în domeniile enumerate.

CNPR Suceava



Postat 04.10.2017

Those willing to participate, sent the documents needed at the school's secretary and 15 members were selected. This is how the new team was born, and marked the start of our metamorphosis to a unified whole. The team coordinator organized the activity of robotics as the robotics circle, created a schedule and requested approval, so it complies with the school legislation:



Educational project

Robotics workshop, school year 2017-2018

Argument

Developing period – school year 2017-2018

Venue – physics laboratory „Petru Rares” National College Suceava

Project partners – “Stefan cel Mare” University Suceava

General aim – developing students' cross-curricular competences

Specific competences:

- achieving the design of a robot depending on the functions it has to perform.
- enabling the robot with intelligence
- putting it to the test
- applying the robot's manoeuvre
- participating in contests of this kind in order to earn experience while competing with other
- good cooperation among the team members of CIRCUIT DEALERZ
- spreading the information regarding the activity of the robotics workshop inside the school and the local community of Suceava.

Contents –hard, soft:

Activities

No.	Activity	Venue	Deadline/Period
1.	Building up the team, electing the representative elements (name, logo, slogan)	Physics laboratory 35	October 2017
2.	Delegating responsibilities inside the team(3D modelling, assembly, software, PR)	Physics laboratory 35	October 2017
3.	Registration of the team in the FIRST competition – Romania	-	November 2017
4.	Building up the communication strategy between CIRCUIT DEALERZ team and the local community	Physics laboratory 35	November 2017
5.	Working meetings of the 4 subgroups in order to create the robot, building it up and enabling it with intelligence; implementing the communication program with the local community.	Physics laboratory 35, practicing on the stage in the educational park.	November-December 2017 – 2018 - January 2018



6.	Taking part in different local competitions in order to have the robot tested and trained.		February - March 2018
7.	Participation in the national contest FIRST Romania, March 2018.	Bucharest	March 2018
8.	Potential participation in FIRST- USA 2018	USA	April 2018
9.	Spreading the information about the experience and the obtained results by the team CIRCUIT DEALERZ during the year of activity (2017-2018).	Activities on the stage in the educational park. Participation in 2 local TV shows.	May 2018

Mentor Mrs. Anca GRECULEAC, deputy teacher.

Participants:

Design 3D: Tanase Albert-Cristian, Hlosciuc Georgel-Florin, Adriano Jucan ,Paduraru Cristian-Daniel

Hardware: Moldovan Andrei , Martin George-Serban , Vlad Andrei Cojocariu ,Macovei Victor-Ioan

Software: Salagean Dragos-Grigore, Matei Barba, Stanciu Catalin-Ioan

PR: Tudor Morar , Munteanu Tudor Emanuel, Blindu Andrei Samuel, Morosan Teodor

Methods of disseminating the results

- in accordance with the strategy of local communication CIRCUIT DEALERZ- community (volunteering for the Christmas Show of the college, volunteering for the organization of the educational park, volunteering for the National Strategy of Community Action, volunteering for orphan children on Easter, cross-border collaboration with Romanian-speaking people from Ukraine and the Republic of Moldova etc.)

Methods of monitoring and evaluation

- modular evaluation for items and activity sub-groups
- filling in feedback forms after each modular evaluation
- individual and group final evaluation (comparing the results based on prognosis)

Risks

- disagreement between the design, the hardware and the software
- lack of funds to finish the construction of the robot, to put it to practice, or to participate in competitions



Quality markers

- markers for the team's cohesion
- progress markers for the achievement of informal abilities concerning: the conception of the robot, its construction, enabling it with intelligence and implementing the communication programme with the local community
- communication markers- the CIRCUIT DEALERZ team and the local community of Suceava

Quantity markers

- the number of meetings of the team members (at least twice a month), recorded with minutes, records etc.
- the number of hours of work in each department
- the number of partnership contracts (over the 2017-2018 school year)
- the number of views on the team's Facebook page
- the amount of evidence (brochures, badges, personalized t-shirts, logs etc.)
- the number of radio and TV appearances, press conferences etc.

Mentor, Mrs. Anca Greculeac, deputy head teacher

And so, the robotics club is also the robotics circle which functions over the duration of the school year 2017-2018. To name a few of the school's clubs and circles: NEXUS, MagicFest, VideoArt, the circle of debating, the circle of translations, Music Star etc.



The members of our team

MATEI BARBA

Hello, I'm from Bosanci, a village from Suceava, Romania. If you ever need me, you can find me on my E-mail mateibarba@yahoo.com or call me on my phone number +40751615169.



Education

Until high school, I have studied in the middle school from my village, but now I am proud to call myself a student of the National College "Petru Rares" Suceava in the tenth grade. Until now I have no awards at the national level competitions, but I have won a couple of prizes at national contests

Activities

For a couple of years I have been participating in a national religious choir divided in four voices (soprano, alto, tenor, bass). Even if I was a child when the choir was formed, I was recruited to sing the bass voice. Also, my father is organizing an local choir made by youngsters from all the county and I am helping him with administrative problems.

Unfortunately, I have not any leadership position, because sometimes I like to much to have control on an activity and there is the risk of becoming obsessed by power. So, I chose to be a regular member, but I'm putting my entire soul in everything I am doing.

Skills

In the few years of high school I have succeeded to evolve my programming language, my team work and also the knowledge horizon. During this time I tried to direct my attention towards C++, Java and English.

Motto and conclusion

"Behold, I stand at the door and knock. If any man hear My voice and open the door, I will come in to him, and will sup with him, and he with Me." (Revelation 3, 20)

My whole life is turned to God and I like to see how He is present even in the smallest things in this world. My only hope in life is to live it doing the Will of the Lord. I know that He wants me to be a light in this dark world and I am trying to be the best in everything I do, so nobody could say that I am a naïve person considering my beliefs, nobody could deny my faith, the precious thing I hold and will hold onto.

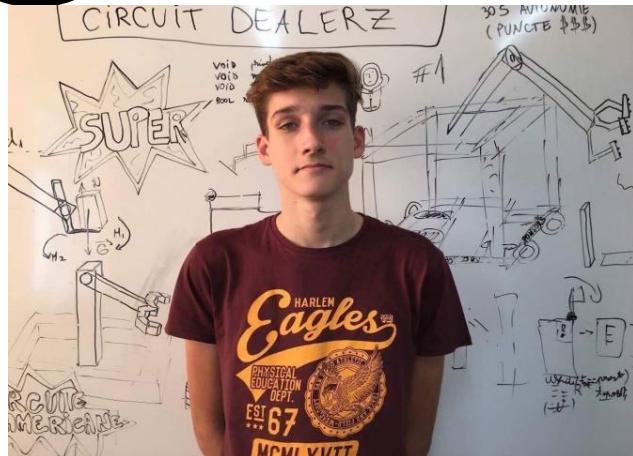


ANDREI SAMUEL BLÎNDU

My name and I am from Bosanci, Suceava. You can call me at +40720012888 or e-mail me at andrei_b2009@yahoo.com.

Education

In all first grades I obtained an excellence diploma, and in the following 4 years I finished with an average of 10. At the final stage of the 8th grade, I scored a perfect score in mathematics and a 9.90 in Romanian, entering National College "Petru Rares" with an average of 9.96 .



In fifth grade I got the second place at the national phase of the Romanian Olimpycs, and throughout the years I obtained notable prizes in Romanian, English, mathematics, physics, chemistry, biology, geography and plastic arts.

Activities

I was a goalkeeper at my local school's football team in Bosanci. At the school championship between classes we placed 3rd, and I was nominated the goalkeeper of the tournament. With my school's team I managed to win the whole rural phase of the championship, qualifying in the final against a school in Suceava, ending up losing the final 2-1.

I also played for my local school's handball team, ending up being the second top scorer in the rural championship.

I also took part in a Debate Club „Civitan 14” ,a molecular physics course at the University of Suceava and in a project based on renewable energies called Erasmus+.

Skills

I have very good computer skills, a beginner level of programming and a good practical sense. I have very good English skills, intermediate French skills and a beginner level of German skills.

Motto and conclusion

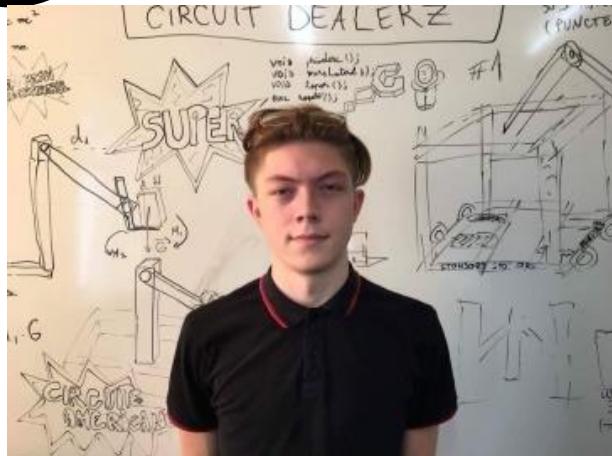
I'm a very versatile person, easy adaptable to situations with skills regarding the STEM part and the foreign languages and social skills.

„ Teamwork is key to success, so be open to any innovative idea”



VLAD ANDREI COJOCARIU

Hello, I am from Suceava, Romania. If you want to, you can call me on my cellphone at 0741575993 or send me an e-mail at vlad_and200@yahoo.com



Education

I am studying at the National College "Petru Rares" and I am in the tenth grade. I don't have any notable awards or prizes.

Activities

The sports I do are calisthenics, jogging and swimming, which I practice every week. I was a volunteer two times in my life in two projects, one in the ninth grade which involved some people from Denmark and the second time I volunteered was in the tenth grade where I helped with a project called "Noaptea Cercetatorilor Europeni" or "European Researcher's Night". The other activities that I am involved in are GROW, a non-profit project made by AISEC and Scoala de Valori which involves people coming from any part of the world to teach us about some subjects. The other one is Erasmus which is a international project that takes place in Germany, Ozzenhausen.

Skills

I am not planning to get any job before I finish high school so I can't say I have any skills regarding that but I do have skills in programming(C++ and a bit of JAVA), Photoshop skills and a little bit of Inventor. Through GROW I've learned how to do a CPR as we were given an example. I have no other particular skills as I am a very good handy man and I learn things very easily.

Motto and conclusion

The motto which I am go by is "Always exceed expectations" which means that if somebody expects me to do something I am going to do it with a little bit more passion than expected and make that person say "Woah! I was never expecting that!" The thing that makes me stand out from other people is that I am a very passionate person and not within the normal parameters.



GEORGEL FLORIN HLOSCIUC

Hello, I live in Moldovita, Suceava, Romania . You can contact me on my email hlosciucgeorgel@yahoo.com or call me at 0754515679.



Education

I am studying at the National College "Petru Rares", I am in the tenth grade.

Activities

I was part of the robotics club from the Palatul Copiilor.

I also played football at ACS Junior CM as a goalkeeper.

Skills

I have no skills to be proud of, but I'm programming 3D in Autodesk Fusion 360, Cleo and Blender, and I have a decent knowledge of English.

Motto and conclusion

"If anyone ever mistaken me, it means he tried to do anything new."

- Albert Einstein

I am a sociable person, I work very easily in a team and work very easy from a practical point of view. I like movies very much and I like to program 3d.



ADRIANO JUCAN

Hi, I live in Suceava, Romania. You can contact me on my email adriano.jucan@yahoo.com or call me at +40751696146



Education

I am studying at the National College "Petru Rares". I am in the eleventh grade and I had no awards, however I have participated in The Olympics of Informatics.

Activities

I participated at some programming lessons and meetings and I use my free time working at robots and electronics. I like to disassemble phones and fix them. I also like creating 3D models.

Skills

I am into programming in C++, Python, 3D design, Arduino and I have a decent knowledge of English. I made my own 3d printer and a robotic arm using recyclable materials and some electric components from old machines.

Motto and conclusion

„Believe that you have it, and you will have it.”

My greatest passion is robotics, programming and quantum physics. Every time I imagine something I work hard to make it. That's why I will never stop myself from reaching my goals.



VICTOR MACOVEI

I live in Suceava, Romania. You can contact me on my email victorioanmacovei29@gmail.com or call me at 0743028857.



Education

I am currently a tenth grader at the National College "Petru Rares" and, last year, I ended up winning the first prize. I participate every year in The National Olympics of Mathematics and Physics, as well as in various contests.

Activities

I attended swim lessons to the point where it got professional and I started to compete in contests. My best award is a silver medal at the National Championship.

Currently I am practicing table tennis and I also am in the high school's volunteering and robotics clubs.

Skills

I have a little more than basic computer skills, and am an advanced English speaker.

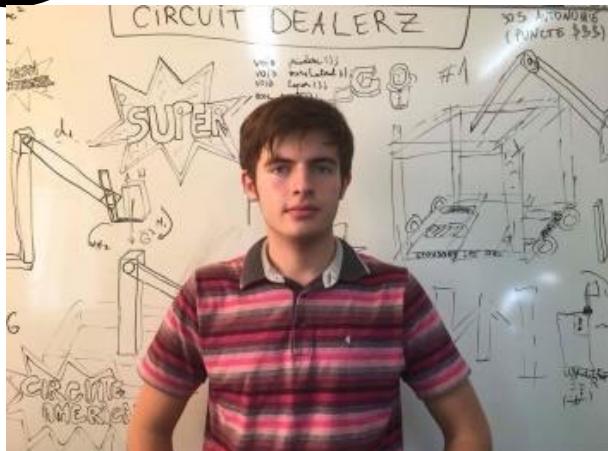
Motto and conclusion

Look at an anthill and think what would happen if you stepped on it. Not much, right? This how the Universe/God looks at us. When you know nothing matters, the universe is yours.



Serban George Martin

I am from Sfantu Ilie, Suceava. I can be contacted via E-mail at serbanstein@protonmail.com or called at 0748337043.



Education

I am currently in the tenth grade at the National College "Petru Rares".

I am proud to say that I won second (2nd) place in the national English Olympics.

Activities

"FTC" Robotics club of the aforementioned 'Petru Rares' National High School:

"Erasmus+ KA2" project involving student exchange and cultural enrichment on renewable energy sources:

- Exchange student
 - Tech support engineer (unofficial)
 - English translator (unofficial)

Skills

English skills: B1-B2 (upper intermediate)

Upper intermediate knowledge of computer hardware and software and basic knowledge of the C++ programming language.

Motto and conclusion

"If at first you don't succeed, call it version 1.0"



ANDREI MOLDOVAN

I live in Suceava, Romania. My phone number is 0756823468 and I can also be contacted via E-Mail at: amoldovan65@yahoo.com

Education

I am a student at National College "Petru Rares" in eleventh grade. I have taken part each year of high school in the National Olympics of Mathematics, in the Olympics of German and Olympics of Physics and have earned awards such as the second or third place at the regional stage.



Activities

I haven't really taken part in any activities during high school. This is the first year I'm participating at FTC and besides this I've been practicing box at a box club. I didn't have any leadership positions.

Skills

I am pretty passionate about programming and I'm good at programming in C++ and Python. I'm also into Physics and that's why I've taken part in many contests.

I'm pretty advanced in English and German. I'm about to get my certificates during the following school year.

Motto and conclusion

"No one saves us but ourselves. No one can and no one may. We ourselves must walk the path."

-Gautama Buddha

I believe that success is achieved only through hard work. No one can and won't evolve and achieve their goals if they don't help themselves. Every choice is ours to make and it shapes our future.

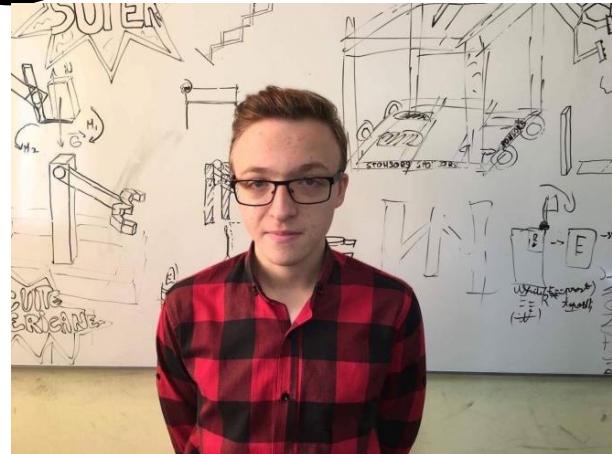


TEODOR MOROSAN

Hello, I am from a village called Granicesti from Suceava. If you need me, you can call me at +40751486881 or send me an E-mail at teomorosan@yahoo.com

Education

Currently, I am a tenth grader at the National College "Petru Rares". I have won various prizes at the National Olympics of English, Romanian, as well as other prizes in domains such as Biology and Chemistry.



Activities

I used to play basketball, but due to certain circumstances, I am barely playing anymore.

I have been involved in a few volunteer projects and activities, one of them being MagicFest, which is a national theater festival that lasts for 10 days, in which people from all over the country come to do theater in English. It's an amazing event, in which I participated twice now and I am proud to say that this year I am Chief of the Technical Department.

Another activity which I am involved in is GROW, a non-profit project made by AISEC and Scoala de Valori which involves people coming from any part of the world to teach us about all kinds of things, like their customs, lives, their problem solving skills in different situations and so on.

Skills

I can't say I have skills that I am proud of, but I have been employed during summer as a waiter and as a bartender, and I have a little knowledge regarding that, especially the former.

I'm confident in my English skills and I also have basic knowledge in programming (C++ and JAVA), Video/Audio Editing Software (such as Vegas and Audition) and extensive knowledge in MS PowerPoint, Word and Excel.

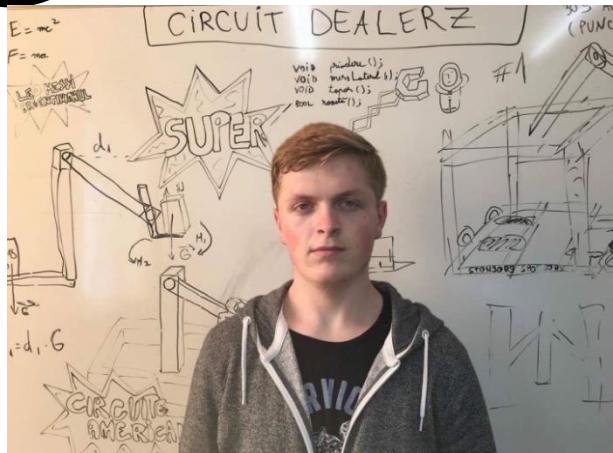
Motto and conclusion

"Humankind cannot gain anything without first giving something in return. To obtain, something of equal value must be lost. But the value of some things can't be measured on a simple scale" This is the motto which I go by and it can be interpreted in many, many ways. It has helped me understand all kinds of things and showed me a whole new way of thinking.



CRISTIAN DANIEL PADURARU

I'm from Suceava, Romania. My phone number is 0749505192, but I would prefer if you would send me an email at padurarucristian37@yahoo.com since I don't usually answer phone calls if I'm occupied.



Education

I'm studying at the "Petru Rares" National College Suceava and I'm in the 10th grade. I don't have any special awards but I have participated at the Mathematics, Informatics and Physics Olympics and ended up getting decent result although I didn't get to the national stage.

Activities

I don't have any activities to mention since I'm not the type of person that would go out in public and it is hard for me to work in a team.

Skills

I can't say I have any particular skills but I'm interested in programming and mathematics. I am a decent English speaker and I have basic knowledge of C++ and Inventor.

Motto and conclusion

"Never stop progressing because there is always someone better than you."

I'm not that much of a social person and I enjoy working alone. I am hard-working and I will never stop learning.



DRAGOS SALAGEAN

Hi there, I live in Suceava,Romania .You can contact me on my email salagean.dragos@gmail.com or call me at +40754933714.



Education

I am studying at the National College "Petru Rares", I am in the tenth grade and I had no awards, however I have participated in The National Olympics of Informatics and in Olympics of Physics.

Activities

I went to FTC last year, I participated at some programming lessons and meetings ,and now I am a Web Designer for our high school's Film Club. I did not have leadership positions in any of these activities as I am an introvert and enjoy working by myself.

Skills

I don't have any skills I can be proud of, however I am into programming in C++, PHP and Java, 3D design and have a decent knowledge of English and German.

Motto and conclusion

"Success consists of going from failure to failure without loss of enthusiasm."

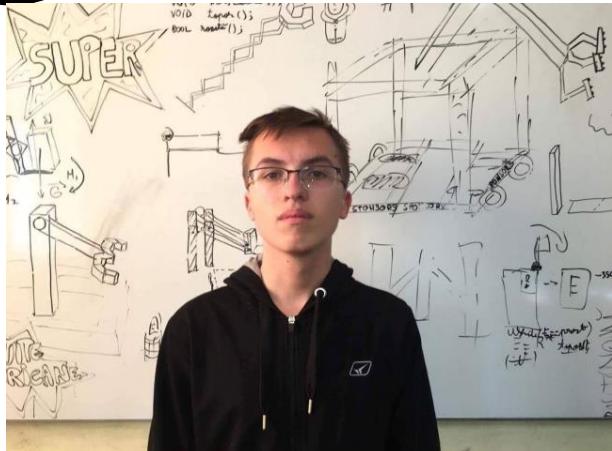
-Winston Churchill

I like to think quite a sociable person, my greatest passions are robotics, programming and anime. I am a hard worker when it's about things I am passionate and I like to experiment with everything.



CATALIN STANCIU

Hello, I am from Salcea, Suceava. I can be contacted via E-mail at catalinstanciu44@gmail.com or called at 0746634904.



Education

I am studying in the tenth grade at the National College "Petru Rares".

I have been at the top of my class up to the 8th grade included. I have participated in various competitions and Olimpics in Mathematics, English, and Computer Science.

Activities

This year I have joined the robotics club in which I am developing the software for the robot.

Every Saturday I attend the Center of Excellence in Computer Science in Suceava in order to improve my skills as a programmer because this is the domain I want to pursue in the future.

Skills

I am fluent in Romanian, I have quite the knowledge in English, and I can speak a bit of French. I have decent knowledge in C++ and Java programming. I have ECDL certificates for MS Word, MS Excel, MS PowerPoint.

Motto and conclusions

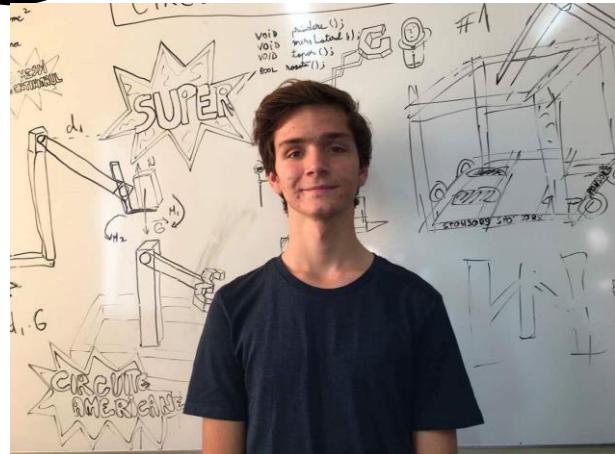
"Every accomplishment starts with the decision to try."

All in all, I can describe myself as a person determined to achieve his dreams, unpredictable in many situations yet level-headed and optimistic.



ALBERT CRISTIAN TANASE

I live in Ipotesti, Suceava, Romania .My email is albert_tanase25@yahoo.com and my phone number is +40749014445.



Education

I am in the tenth grade at the National College "Petru Rares", in Suceava.

I have won the first prize in the national physics competition "Phi", second honorable mention in the national competition of the centres of excellence in mathematics, honorable mention in the national competition of the centres of excellence in Physics, honorable mention at the county level of the National Olympics in Physics.

Activities

I have been part of the basketball team of my high school since 9th grade but I started playing at a local club 3 years ago. I have participated in several championships ranking top 3 every time.

I have been a volunteer at Interact for 4 years, taking part in many activities for the better of my community.

Skills

I am an advanced english speaker passionate in architecture and 3D modeling. I love playing sports and the guitar. Most of the skills that I have acquired over the years are from individual study but also from school.

Motto and conclusion

"If you can't fly, then run,
If you can't run, then walk,
If you can't walk, then crawl,
But whatever you do, you have to keep moving forward!"
-Martin Luther King Jr.

I think that everyone should try to do their best, constantly becoming a better self. At least, this is what I am trying.



Mentor and supporters

ANCA VIORICA GRECULEAC - MENTOR

Mail - ancagreculeac@yahoo.com

Phone - +40723630706

Education

Physics Faculty, 5 years «Alexandru Ioan Cuza» University of Iasi, 1987-1992



M. A. Academic Programme «Communication and Public Relations», «Stefan cel Mare» University of Suceava, Letters Faculty, 2005-2006

M. A. Academic Programme «Management and marketing» Technical University «Gh. Asachi» of Iasi 2007-2008

Activities

- teacher of physics at "Petru Rares" National College, Suceava

-supervising and controlling functional departments of "Petru Rares" National College, especially those referring to continuous training of teachers, nonformal education, ensuring and supervising the quality of educational processes, public acquisitions.

-bilingual teaching of physics to bilingual Romanian-French mathematics – informatics classes

-coordinator of methodology, School Regional Inspectorate

-adults and youth training programmes (continuous training) as part of nonformal education programmes such as: trainer of participants in summer camps – For example the METAMORPHOSIS summer camp, in scientific education programmes for youngsters such as NEXUS-T-SV, coordinator of scientific events such as RoSEF, etc.

-volunteering activities as coordinator of the Volunteering Club of "Petru Rares" National College Suceava

-didactic research activities, with results published in :

Books and journals:



Editorial Team (together with prof insp. CIOBICA CARMEN GINA, prof. GRECULEAC ANCA, prof. CAPBUN DANA), Physics and Chemistry Journal "VOLTA JOULE", nr 1-10, 2004-2010

GRECULEAC ANCA "The collaborative competitive method in ICT", Suceava 2012, Published by Little Lamb, ISBN 978-606-648-050-5

GRECULEAC ANCA VIORICA, DUMITRASCU GABRIELA, "Smart learning spaces and the feeling of togetherness", Suceava 2015, ISBN978-606-744-028-7

GRECULEAC ANCA, SALCIUC LAURA, MIHAI ERHAN

„Counselling for personal development”- Course for adults with interdisciplinary elements of theory and practice, Published by "George Tofan", Suceava, 2016, ISBN 978-606-625-209-6

Scientific articles:

GRECULEAC ANCA " INVENTION AND INNOVATION – FORMS OF INTERDISCIPLINARY EDUCATION AT "PETRU RARES" NATIONAL COLLEGE SUCEAVA, CONNECTED TO THE STUDENTS' SECURITY IN THE SCHOOL ENVIRONMENT", article in "Smart learning spaces and the feeling of togetherness", Suceava 2015, ISBN978-606-744-028-7

GRECULEAC ANCA "Curricular openings on subjects proposed by morphological theories of the Science of Complexity", article in "Smart learning spaces and the feeling of togetherness", Suceava 2015, ISBN978-606-744-028-7

GRECULEAC ANCA, "Project-based learning" in «Science and Complexity», Suceava 2009

GRECULEAC ANCA, article "Towards inter and transdisciplinarity", in "Interdisciplinarity and complexity" Suceava 2010

GRECULEAC ANCA article "Time in the time of an interdisciplinary summer camp" in "Time in its complexity", Suceava 2012

GRECULEAC ANCA, CIOBOTARIU MIHAELA article "Monitoring functions of forest spaces of Suceava town with the help of NOVA 5000 System", in "Earth is crying- Save her!", Rovimed Publishers , ISSN2457-6174, 2015

-coordinating European projects of the college:

Erasmus + Projects of the College are as follows :

"Developing teachers' competences with a view to counselling students for personal development", code 2014-1-R001-KA101-001326



"New perspectives on authentic learning through the use of natural spaces in transdisciplinary manner", code 2016-I-R001-KA101-023553

"A new energy for new European citizens", code 2016-I-FR01-KA219-024161_4, with partners in France, Germany, Holland, Poland

"CIVIC - Cooperation Innovatrice Vers l'Interdisciplinarite Civique", code 2017-I-FR01-KA219-037281_2, with partners in France, Italy, Portugal, Poland

-coordinator of Robotics and Inventics Clubs of the college

Examples of results of Inventics Club activity:

National Contest ROSEF:

- 1. Scalar Waves**, authors Ioana GRECULEAC, Tudor Petracovici, Second Prize
- 2. Medical game for revealing movement deficiencies**, Veronica Ieremie si Alexandru Coltuneac, Third prize
- 3. Capturing solar energy (mass solar radiation) and transforming it into electricity** Vlad Lazar si George Bejinariu, Third prize
- 4. Speech solutions for disabled persons**, Alexandra Manciu, Serban Slinca, Second Prize
- 5. System for monitoring cardiac rhythm**, Ungureanu Andreea, Honourable Mention

Innovation Contest "Da Vinci", Bucharest

- 1."Phenomenological simulations with applications in Earth Physics", Team CNPR (Bejinariu George, Lazar Vlad), Honourable Mention.
- 2."Medical analysis of body posture and movement deficiencies through the innovative game SPACEMAN", The Move Team (Ieremie Veronica, Alexandru Coltuneac), First Prize.



International Contests

Olympiad of Environmental, Engineering, and Energy projects

ISWEEEP SUA - International Sustainable World – Energy, Engineering and Environment Project Olympiad 2016

- 1."Alternative Solution for Speech Disorders", Alexandra Manciu and Serban Slinca, silver medal.





INESPO – International Environment Sustainability Project Olympiad

"Real Time Home Security Alert System", Pavel Vlad, Lavric Ionatan, silver medal, 2014

"The social dimension of attention", Alexandra Manciu and Serban Slincu, silver medal, 2015.

ESE – European Science Expo

„Subliminal overlimits”, Authors: Andra Tofan, Alfred Tarca, 2014

“Phenomenological simulations with applications in Earth Physics”, Authors George BEJINARIU and Vlad PAVEL, 2016

Skills

- assertive and effective communication
- productive negociation
- inventiveness in providing solutions



Interviews of supporters

Miss Mihaela Fodor

Question: What is the impact of English, as a foreign language, upon the world of robotics and technology?

Answer: English is the main tool in communication among the members of the Robotics team, so while using it, students enrich their knowledge and broaden their horizons. Additionally, the technical terms they use make the students get an insight into the cultural and wider global context of the continuously developing world of technology and robotics.

Question: Could you imagine a world where robots would teach English in schools instead of teachers?

Answers: Today it is hard to imagine a world where robots do activities that we so strongly associate with humans, but judging the fact that technology is evolving at an explosive rate, I think that the Science-Fiction Universe might become reality in the near future. There already exist online sites that provide quality English lessons, so being able to implement this into an Robo-Teacher doesn't seem so improbable.

Question: Do you think that knowing English is mandatory in working in a STEM domain ?

Answer: English has taken the world by storm and while other countries still prefer other languages, English is mandatory in most domains now. Considering the fact that Laboratories and STEM Cultural centers are located in heavily developed and industrialized countries where English is the main language used to communicate between employees of different nationalities, I think that working or even studying in a STEM domain require good English skills.

**Miss Dungeanu Daniela**

Question: What is the contribution of the existence of the robotics club to raising the level of education provided by CNPRSV.

Answer: By joining and working in the robotics club of our high school, students develop important STEM skills that are preparing them and guiding them towards a career in Science, Physics and Robotics. It is said that in the future employers will seek people with at least average STEM skills, and any domain will require such skills, so the robotics team already prepares the students for the jobs of the future.

Question: What other skills do you think FIRST Tech Challenge develops?

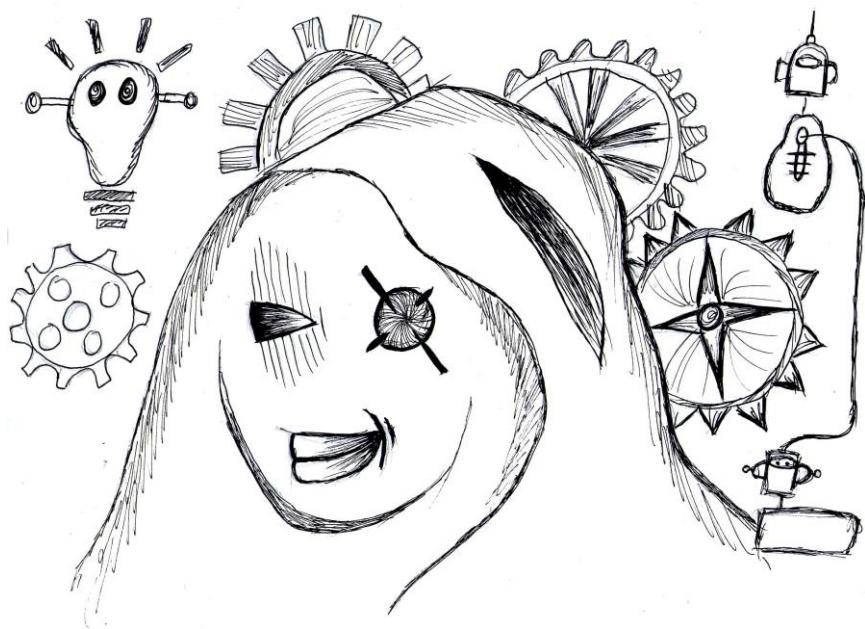
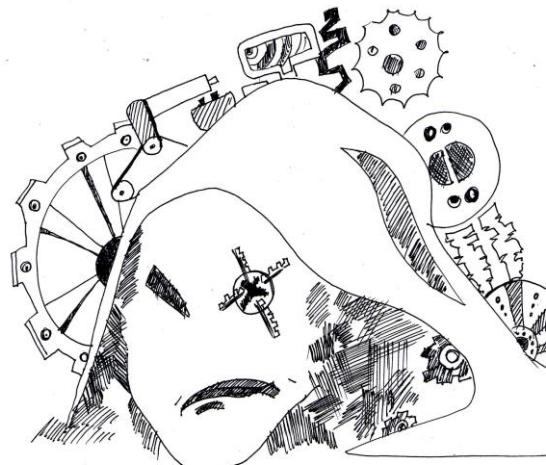
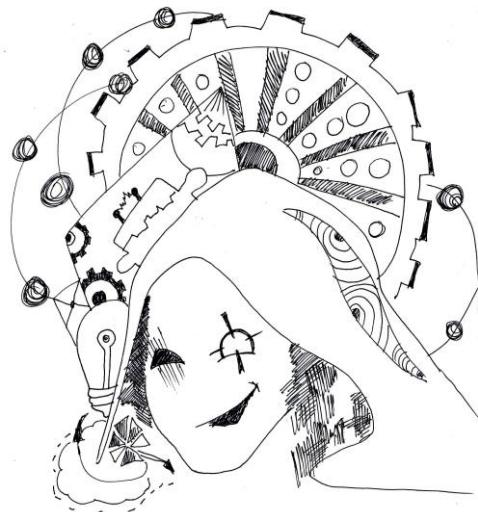
Answer: Another aspect of this competition is that students work in a team. Many people struggle working in a team and big companies such as Google or Microsoft exclusively encourage teamwork and cooperating with other individuals. Learning how to manage your tasks and how to deal with problems as a team are incredible skills that the students acquire through the robotics club.

Question: What is the impact of the robotics club to a member's future?

Answer: The FIRST programmes and values are recognized worldwide and taking part in FIRST Tech Challenge surely benefit the students in the future. Prestigious Universities always keep an eye out to competitions like this and I consider that when a member of any robotics team across the country will apply to an University, they will have higher chances to be accepted than the other ones.



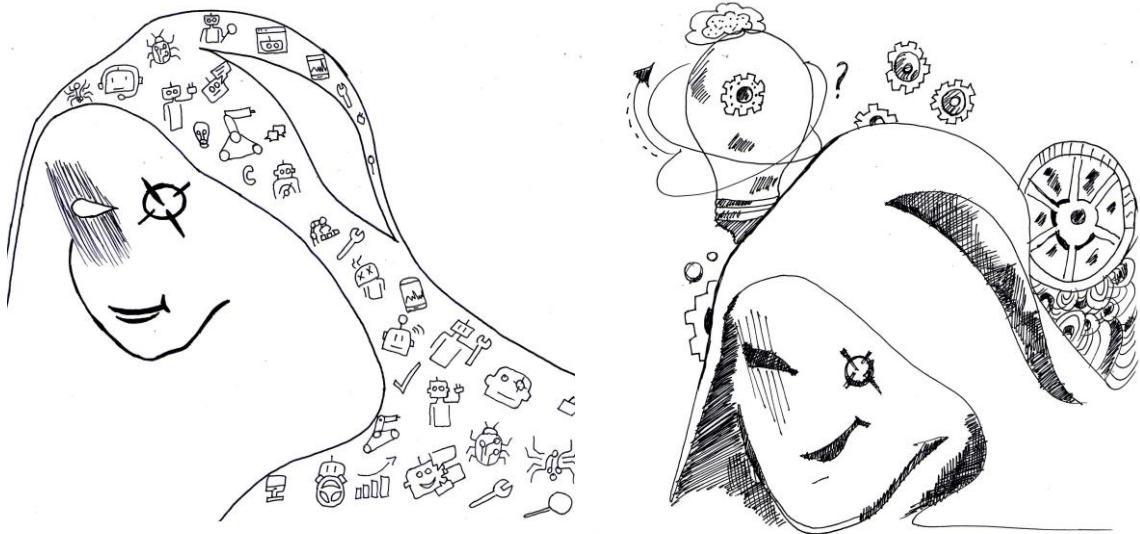
The art club made up of 5th graders were inspired by the robot and became our fans and our supporters, on top of drawing our logo in different moods as well as the logo from last year in color.



Team #R0 044



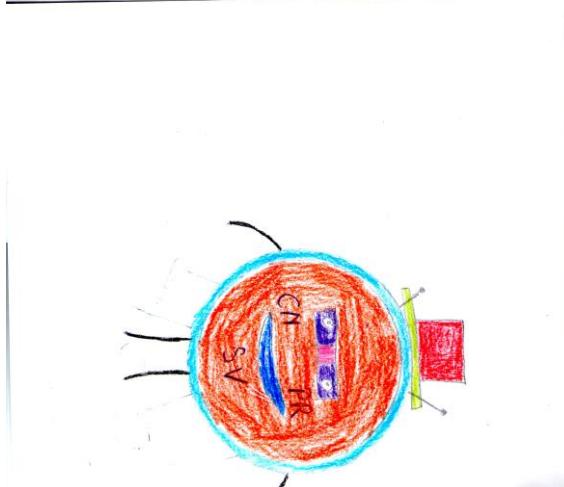
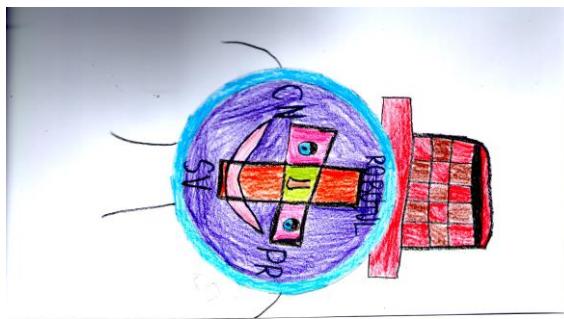
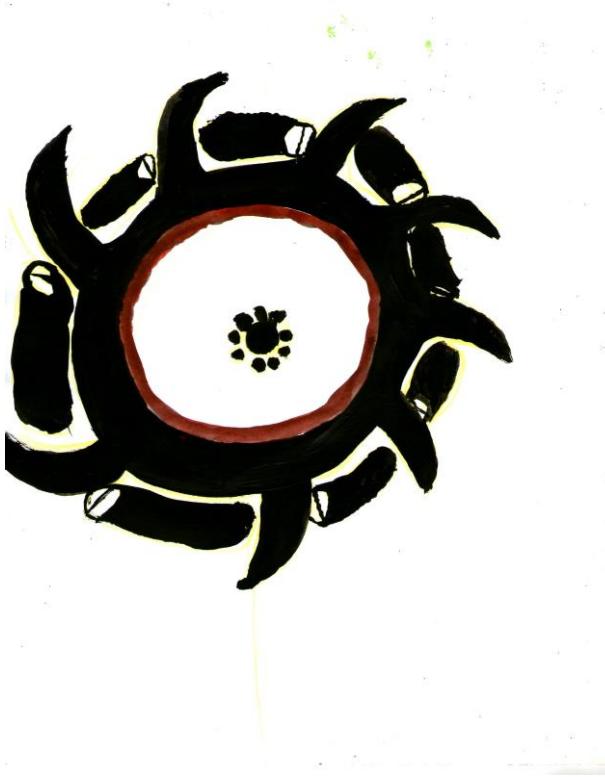
Circuit Dealerz



Team #R0 044



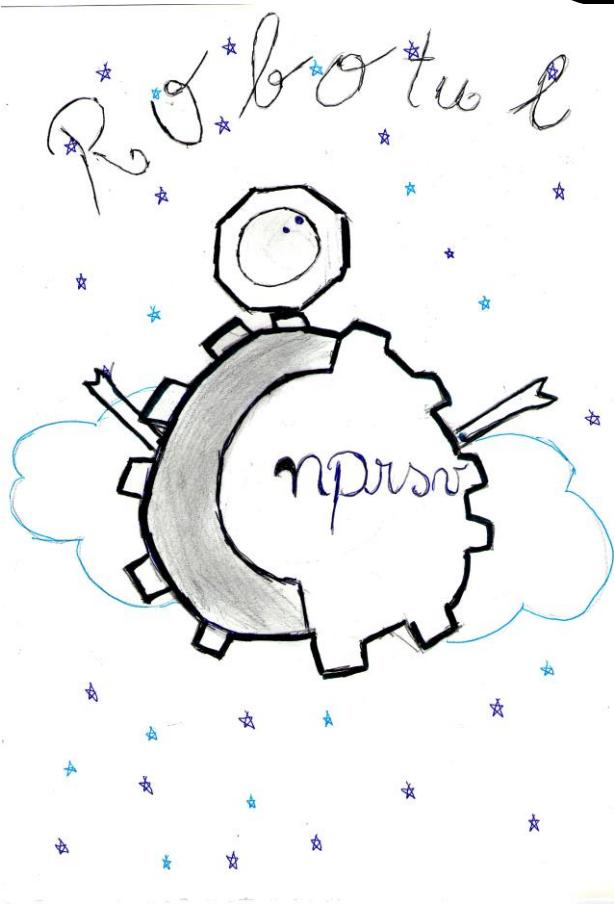
Circuit Dealerz



Team #R0 044



Circuit Dealerz





Developing our team in our community

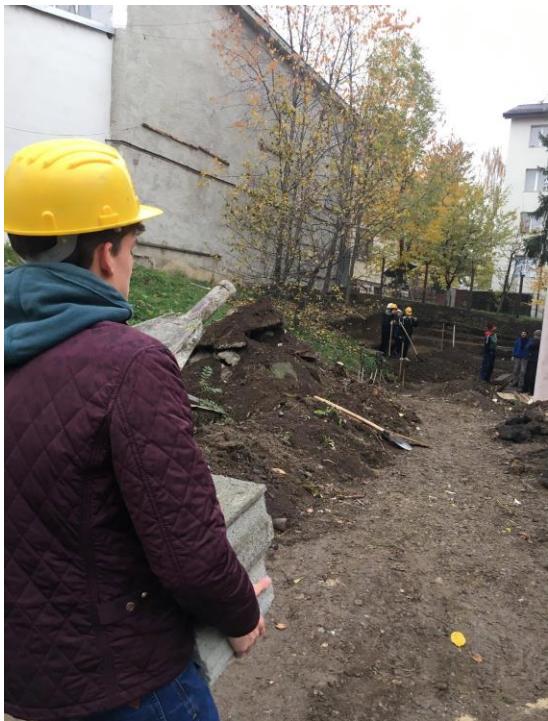
Volunteering

With the occasion of the college's educational park being under construction we decided we should volunteer and help out the workers. So we got our construction helmets and our shovels and we went



to the construction site.





We stayed there for one hour and a half and then we went to the lecture hall for another volunteering activity and painted some structures that were going to be used at the Christmas Charity Ball of our school. As a result of this volunteer activity and the fact that the organizers cherished the CIRCUIT DEALERZ team and how it was involved in the high school activities, the EXCELPIOR Association of the students decided to reward a sponsorship of nearly 1,000 euros.

We participated in the charitable activities carried out by the college volunteer club, which resulted in the donation of products to a family with a lot of children. Our team decided to make a fundraising action because we wanted to help a poor family in need and this was the only way in which we could make money.

Firstly, we needed to choose what we wanted to sell and after a meeting with the team we had agreed to write a list with all the products and a table that included all the initial prices, the selling prices and the resulting profit that we could make by selling all this things in our high school.

Products	Initial price (RON) -each	Initial price (USD) - each	Selling price (RON)	Selling price (USD)	Profit(RON)	Profit(USD)
MILKA CHOCOLATE	3,60	0,936	5	1,3	1,4	0,46
AMERICAN COOKIES	0,39	0,10	1	0,26	0,61	0,16
MUFFINS	0,5	0,13	1	0,26	0,5	0,13



MARSHMALLOWS	4,6	1,19	6	1,56	1,4	0,37
SUGUS	0,13	0,03	0,33	0,08	0,20	0,05
TEDI	1,30	0,33	2	0,52	0,70	0,19

After finishing the table (that you can find above) and after we calculated the profit resulted, we just needed an approval from our head teacher. Regrettably, our list was not approved because of the fact that our products were not packed. We had a discussion with her and we discovered which products are selling in activities such as this. After this consultation we had rethink the list and we obtained a new list with prices and profits that just contained the packed products from our initial list.



From all the products that we had prepared for the fundraising we were sure that the product that we would sell faster would have been the SUGUS candies. Strangely, our expectations were wrong, as the best-selling product was the TEDI juice.





The first time when we went to the shop in order to buy TEDI juice, we bought out all the juice from that store - we paid 50 RON (13 USD) and all the juice had been sold in the first break. Therefore, we had been forced to going in to another store for refilling our inventory of TEDI juice.

To understand how high the demand for the product was, we want to mention that we were



constrained to refill our stock twice. In total we bought 200 RON (52 USD) worth of TEDI juices or in other words we bought 154 packages of TEDI juice.

After all the things that happened in that day we want to thank all our teammates that supported us but also we want to show our gratitude to our head teacher that let us carry out this activity in our high school.

We can tell that this activity helped us to get to know each other better but thanks to this, we also realized how much it means to help out the people in need. We also understood that all these deeds are very important for people such as them. It was an extraordinary experience to see the goodwill and the desire of our teammates to help us in this noble cause.



The psychological test of the members of CIRCUIT DEALERZ team for the purpose of identifying the strong and weak points and the necessary activities required for increasing cohesion and competitiveness between team members.

All the team members of CIRCUIT DEALERZ agreed and considered that it is necessary to go through a typical psychological test created by the psychology office of the college.

First name and last name:

Self-evaluation Sheet

For the purpose of increasing our team's cohesion, we need to know you better and you need to know yourselves better. Because of this we will have you complete the profile presented below, evaluating yourselves as objectively as possible on the following scales. Answer as honestly as possible, assessing the way you really are, and not the way you would like to be. Thank you!

I THE COGNITIVE ASPECT - Cognitive skills (knowledge):

1. Analytical thinking (the capacity of the person to identify logical rules and apply them to problematic situations, in well-specified, as well as less systematic conditions)

I believe I have analytical thinking

Very little	Little	Average	Much	Very much
1	2	3	4	5

2. Analogical transfer (the capacity of a person to find similarities in a new, problematic situation and a familiar situation in which the conditions of the environment are ever-changing)

Very little	Little	Average	Much	Very much
1	2	3	4	5

3. Working memory (The capacity to simultaneously operate with multiple types of information)

Very little	Little	Average	Much	Very much
1	2	3	4	5

4. Cognitive interference (The capacity of a person to deal with ambiental and distracting stimuli, which can negatively affect performance)

Very little	Little	Average	Much	Very much
1	2	3	4	5

5. Spatial skills (the capacity to analyze spatial relations between the elements of a space, creating an adequate mental image of it and then recognizing the respective space from another perspective)

Very little	Little	Average	Much	Very much
1	2	3	4	5

6. Decision-making skills(the capacity of a person to make a decision based on the rational analysis of information, with a focus on analysis rather than intuition)

Very little	Little	Average	Much	Very much
1	2	3	4	5

**II. THE SOCIO-PROFESSIONAL ASPECT**

- 1. I work well*
- a. in a bigger team(over 4 people)
 - b. in a smaller team(2- 3 people)
 - c. alone

- 2. My temperament is predominantly a. introvert
b. extrovert*

- 3. I like meeting new people*

<i>Very little</i>	<i>Little</i>	<i>Average</i>	<i>Much</i>	<i>Very much</i>
1	2	3	4	5

- 4. I am an organized and diligent person*

<i>Very little</i>	<i>Little</i>	<i>Average</i>	<i>Much</i>	<i>Very much</i>
1	2	3	4	5

- 5. I work according to schedule.*

<i>Never</i>	<i>Sometimes</i>	<i>Always</i>
1	2	3

- 6. I tend to be at a loss in stressful situations*

<i>Never</i>	<i>Sometimes</i>	<i>Always</i>
1	2	3

- 7. I feel comfortable when I have to speak publicly*

<i>Never</i>	<i>Sometimes</i>	<i>Always</i>
1	2	3

- 8. I accept other people's arguments, but I make decisions based on my own judgement*

<i>Never</i>	<i>Sometimes</i>	<i>Always</i>
1	2	3

III. FUTURE PLANS

- 1. I have set a goal professionally (e.g. to work for the NASA, to do research etc.)*

<i>Not at all</i>	<i>I'm still considering it</i>	<i>Certainly</i>
1	2	3

- 2. I know what my objectives are*

- A. short term*
.....
.....
B. medium term
.....
C. long term.....



3. I am aware of the steps I have to take in order to achieve my professional goal.

Not at all I'm still considering it Certainly

1 2 3

4. My main quality which can help me to succeed professionally is.....

5. The limitation which might prevent me from succeeding professionally is.....

6. On a professional level, my guiding principle is(e.g. positive values - competence, collaboration, performance e.g. negative values - pragmatism)

7. On a personal level my most important value is

College psychologist Popescu Nicoleta



Following the statistic interpretation of the answers in the evaluation forms, we have obtained the results below for the Cognitive Aspect:

	Moldovan Andrei	Salagean Dragos	Stanciu Catalin	Blindu Andrei	Tanase Albert	Macovei Victor	Barba Matei	Cojocariu Vlad	Hlosciuc Georgel	Jucan Adriana	Paduraru Cristian	Martin Serban	Munteanu Tudor	Morosan Teodor
Analytic thinking	X II	X III	X III	X IV	X I	X II	X III	II	I	X I	X I	X II	X IV	X IV
Analogical transfer	X II	X III	X III	IV	X I	II	III	X II	X I	X I	X I	II	X IV	X IV
Working memory	X II	III	X III	X IV	I	II	III	X II	X I	X I	X I	X II	X IV	X IV
Cognitive interference	II	III	X III	IV	X I	X II	X III	II	I	X I	X I	II	IV	X IV
Spatial skills	II	III	X III	X IV	X I	X II	III	II	I	X I	I	X II	X IV	IV
Decision-making skills	X II	X III	III	X IV	I	II	X III	II	X I	X I	I	X II	X IV	X IV

X refers to the students who assessed themselves above the average on the tested cognitive aspects.
The table also includes the departments the students belong to:

I – 3D Design department

II-Hardware department

III-Software department

IV -PR department



When summarizing the results for all the members of a department, the results are as follows:

	3D Design Department I	Hardware Department II	Software Department III	PR Department IV
Analytic thinking	XXX	XX	XXX	XXX
Analogical transfer	XXXX	XX	XX	XX
Working memory	XXX	XX	X	XXX
Cognitive interference	XXX	X	XX	X
Spatial skills	XX	XX	X	XX
Decision-making skills	XX	XX	XX	XXX

There can be noticed a relatively uniform distribution of the performance corresponding to the cognitive aspects. However, the most important thing is that the members of a department complement each other. For instance inside the Hardware department (II) two of the students possess above average analogic transfer abilities and two of them are below average. In this way the students rely on each other for personal development through interaction in the team. This is actually the principle we have agreed upon for the group's efficiency: "The team is a personal development laboratory where we learn from and rely on each other. The uttermost outcome is the progress of the team members from the intellectual and behavioural perspective"



Regarding the socio- professional aspect, the following results were issued:

	Moldovan Andrei	Salagean Dragos	Stanciu Catalin	Blindu Andrei	Tanase Albert	Macovei Victor	Barba Matei	Cojocariu Vlad	Hlosniuc Georgel	Jucan Adriana	Paduraru Cristian	Martin Serban	Munteanu Tudor	Morosan Teodor
Prefers to work in a big team		x	x										x	x
Prefers to work in a small team	x			x	x	x	x	x	x	x	x	x		
Prefers to work alone											x			
Describes himself as introverts		x	x			x	x		x	x	x	x		x
Describes himself as extroverts	x			x	x			x					x	
Describes himself as organized and diligent	x					x		x			x			x
Describes himself as a good planner						x								
Describes himself as emotionally stable	x			x	x			x			x	x		
Enjoys speaking publicly	x			x	x			x				x		
Autonomous, independent	x	x	x			x		x		x		x		

For the socio-professional aspect the table reveals which team members consider themselves as introverts or extroverts, which of them work better in big or small groups. The x refers to the students' qualities with reference to the aspects on the left side. For example, one x means that the student believes he possesses that quality over 50%, if compared to 100%. If there is no x next to the respective social aspect, this means the student believes he possesses that quality below 50%. It is to be noted that all the members of the team with one exception prefer to work in teams, either small or big, while the team coordinator would rather work in a big team. Most members consider themselves as introverts, whereas most of them regard themselves as independent. This is to be considered when establishing the type and frequency of the future team building activities and of the activities to be performed in stage II (Brainstorming) in order to ensure an increased cohesion of the team and of the extent to which its members can become extrovert.



With reference to the future plans of the team members, the results were as follows:

Recommendations	Personal value	Professional value	Personal flaw	Personal quality	Objectives	Professional goal
The will to enhance patience	Respect	Performance	Lack of patience	Determination	Clearly stated	Clear, knows how to achieve it
Thinking out of the box. Setting clear goals	Dignity	Collaboration	Borderline introversion	Intelligence	Too general sometimes	No clear goal
Time management	Family	Hard work	Lack of time	Perseverance	Clearly stated	Clear goal, doesn't know how to achieve it
Time management and better organization	The appreciation of others	Quality work	Procrastination	Flexibility	Clearly stated	No clear goal
Facing the fear of prejudice step-by-step	Honesty	Seriousness, perseverance	Shyness	Scientific curiosity and collaborative spirit	Clearly stated	Clear goal
Thinking out of the box. Better planning and organization	Thinking	Philosophical approach	Borderline introversion	Intelligence	Too general sometimes	No clear goal
The will to approach dull tasks	Honesty	Passion	Lack of interest in dull tasks	Devotion	Clearly stated	Clear goal
Time and study management	Honesty	Optimism	Limited knowledge	Perseverance	Too general sometimes	Clear goal
The will to overcome personal flaws - procrastination	Simplicity	Collaboration	Procrastination	Passion and involvement	Clearly stated	No clear goal
Setting clear goals. Limited overthinking	Personal experience	Passion	Overthinking	Objectivity	Too general sometimes	Clear goal
Knowing the self-Realistic self-image	Sense of community	Scientific curiosity and collaborative spirit	Self-criticism	Patience	Too general for medium and long term	Clear goal
Changing the approach to motivation	Tolerance	Passion	Lack of motivation	Intelligence	Clearly stated	Clear goal
Objective approach to decision-making versus stubbornness	Family	Passion	Stubbornness	Perseverance	Clearly stated	No clear goal
Setting clear goals and progressive steps	Harmony	Perseverance	Unsteadiness	Observance	Clearly stated	No clear goal



It is to be noted that all the team members would like to succeed in life on the basis of positive values (e.g. personal values include: respect, dignity, family, the appreciation of the others, honesty, simplicity, personal experience, a sense of responsibility, tolerance, harmony), which is relevant for the spiritual innocence of the team members, but is relatively unrealistic as to accessing the job market. On the other hand, with reference to professional value, which is essential to each one of them, it ranges from work and perseverance through optimism and collaboration to passion and enthusiasm. This is actually a plus for the team members, which must be put to best use in their current and prospective activity.

The test ends with advice from the psychologist for each respondent, which is useful on both individual and collective levels. If on a personal level, time management must be improved for four students, it becomes a problem for the team. If the lack of clear future goals is a problem for 3 students, then it must be seriously considered by the whole team and in the team building activities for the respective individuals.

Conclusions

The final structure of the departments is appropriate for each individual, as well as for the team as a whole.

.The strong points of each department enable its performance, while the weak points can be counteracted within each department.

The structure of the departments is as follows:

3D Design: Tanase Albert-Cristian, Hlosciuc Georgel-Florin, Adriano Jucan ,Paduraru Cristian-Daniel

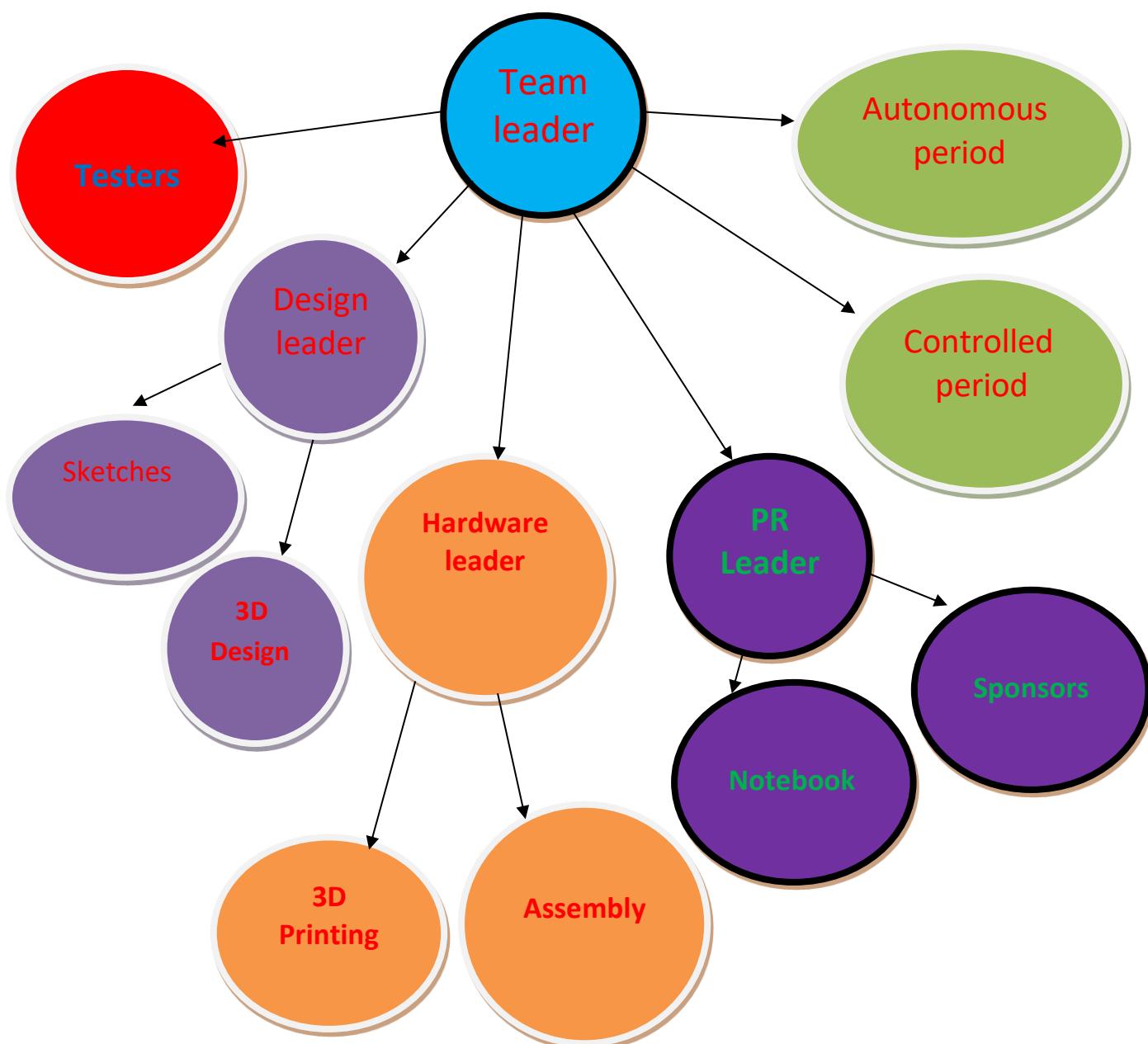
Hardware: Moldovan Andrei , Martin George-Serban , Vlad Andrei Cojocariu ,Macovei Victor-Ioan

Software: Salagean Dragos-Grigore, Matei Barba, Stanciu Catalin-Ioan

PR: Munteanu Tudor Emanuel, Blindu Andrei Samuel, Morosan Teodor



The organization within the departments is as follows:





There have been organised 8 team building activities with the team, in collaboration with the school psychologist. The purpose of the activities was to boost self-esteem and decrease introversion, to increase trust among the members, to establish appropriate time management and to educate patience. The activities focused on the following topics:

1. Self-awareness and self-acceptance
2. Beliefs and behavior
3. Emotions
4. Problem-solving and decision-making
5. Interpersonal relationships

The general objectives of the counseling were:

- Managing negative and dysfunctional emotions
- Finding creative solutions to the current problems
- Improving time-management skills
- Developing communicative abilities with parents and teachers
- Progressively surpassing limits imposed by the introvert temperament

1. CLARIFICATION

A) Self-awareness and self-acceptance

Objectives - to identify the physical, intellectual, spiritual, emotional and social aspects of the self

- to understand the connection between self-acceptance, behavior and feelings
- to boost the child's feeling of inner strength
- to improve the ability of using positive language (to face self-guilt)

Discussion- How difficult was it to describe your selves? Is there any link between these categories? How would you describe yourselves to someone else?

Conclusion- These aspects are part of identity, and whether or not they feel strong /weak in one area does not mean they are the same in all areas.

B) Emotions

Objectives - to learn that nobody else can control our feelings or emotions, nor are they responsible for our unhappiness

- to learn that some emotions are helpful while others are not (the use of dialogue to the self so as to achieve emotional control)



- to understand that anger can be avoided and controlled (the domino effect of negative emotions, healthy versus less healthy displays of emotions)

- to identify other people's emotions, to analyze the consequences of emotions

1. Questions about content- which list has more words and what, in your opinion, differentiates helpful from less helpful emotions
2. Questions about personality- what emotions do you usually have, what emotions would you like to have, what can you do to avoid unhelpful emotions

Conclusion - They needed help to differentiate the various types of emotions, and to become aware that they can avoid emotions which don't help them or which they cannot face.

2. REFLECTION

Beliefs and behavior

Objectives - to learn how to distinguish rational from irrational beliefs (the difference between wishes and needs, the effects of irrational thinking)

- to identify examples of excessive generalizations and their effects (absolute thinking-always, must)
- to identify long-term and short-term consequences of behavior (estimating the consequences of behavior on personal interests and on the others)
- to develop strategies of counteracting their own or the others' irrational thinking

Discussion

Questions about content- what, in your opinion, is the difference between rational and irrational beliefs, what do you have to do to erase and replace irrational beliefs?

Questions about personality- Have you ever tried this method? How did you find it? Would you like to try it now? How do you use it?

Conclusion- offering as many examples as possible is really helpful for reshaping the students' way of thinking



3. CONFRONTATION

Objectives:

- To learn how to differentiate the problem-solving or decision-making approaching or avoidance strategies (the difference between a good and a less good decision)
- To explore the effects of emotions on problem-solving and decision-making abilities (evaluating the impact of others' pressure on solving personal problems)
- To develop the ability of separating complex situations into sub-situations (identifying the factors which can or cannot be controlled under certain circumstances)
- To develop the ability of establishing short-term and medium-term goals (ways of managing procrastination)

Interpersonal relationships

- To distinguish between reasonable compulsory situations from unreasonable ones (arguments for and against), to learn assertive abilities in response to the others' pressure (improving the relationships with the others)
- To identify the advantages and disadvantages of performing an action in order to gain social acceptance (we are not necessarily what others say we are)

Discussion - on content, personality

Conclusion - we cannot change the people, but we can change the way in which we relate to them

RECOMMENDATIONS

Students - should communicate freely, both with their peers and the adults, to be able to explain what they think and feel

Coordinating teachers - should offer constant support to these students in the activities they perform.



Strong Points	Weak points
<ul style="list-style-type: none"> • The existence of positive value which leads to consistent and long-term success. • The common register value increases compatibility between team members. • Above average intellect of the team. • Splitting into departments, which satisfies the student's preference of working in smaller groups (the preference of working in smaller groups can lead to the idea that students are more productive in these conditions, an aspect which is related with the predominance of the introvert aspect) • In each department there is at least one member who considers himself emotionally stable and does not feel major discomfort when speaking publicly, meaning every department is balanced. • The fact that the team coordinator prefers working in bigger groups means that he is «The right person at the right place» • Knowing the limits/defects which impede progress (realistic image of self) 	<ul style="list-style-type: none"> • The Software department (III) seems to be the "weak link" of the team. Its members don't evaluate themselves positively on aspects such as: Organizing, Diligence, Planning and Emotional Stability • General weak points of the members: emotional instability, procrastination, bad time-management, shyness - all these aspects can be addressed individually/ in group



Birthday celebration

Since some of us had their birthdays during the competition, we decided it would be a good idea to celebrate our birthdays together, in order to strengthen the bond between us. We chose to buy pizza, since it was our favorite, and it was the most affordable. Also, we bought soda, because it's a must at any party. Not everyone was present, due to certain circumstances, and some came at different times, but we enjoyed ourselves to the fullest and got along really well.

We took a lot of photos, but most of them turned out really blurred and unprofessional, so it was a let-down for us. But what really matters is that those photos will be forever in our memories, along with the good times we had during the celebration.



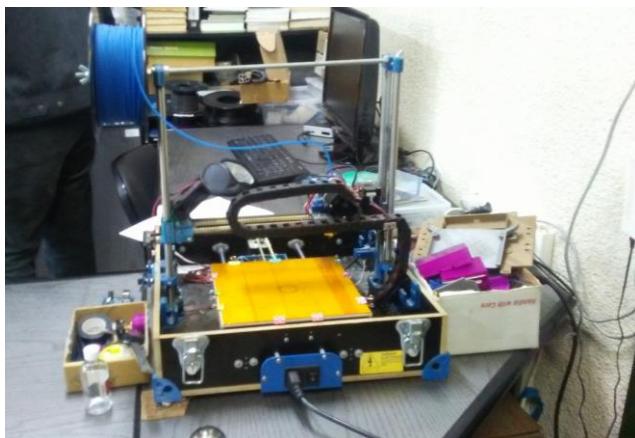


Introduction to the STEM community

We wanted to have the support of as many people as possible for this project and for this reason we contacted the University in our city and we got huge feedback from the people there. They helped us realize our shortcomings and how to improve ourselves on both professional and personal values.

A big help came from professor Prodan Remus, who teaches robotics at the University and who taught us a lot about robotics and how to get better at it. He also introduced us to a few people, for example, to someone who taught us how to cut metal properly, and how to make better use of its properties. They were all very kind and knowledgeable in what they were doing.

But most importantly, he gave us access to his laboratory which contained a 3D printer, a CNC and a lot of other tools which proved to be really useful for our team.



We already had a 3D printer, but it was broken so we couldn't use it. We asked professor Remus Prodan to help us but he couldn't repair it because we had to buy new parts for it.





Looking back

The development plan of the CIRCUIT DEALERZ team in temporal correlation with its activity/achievements

No.	Stages of the team's forming and functioning, after Bruce Wayne Tuckman "Tuckman's Stages"	Time period	Activities/achievements
1.	<p>The team's formations It's a stage where those who have been selected for the team become part of it, they define their role as a member, want to get to know and make relationships with the others. The team's common objectives are established to build mutual trust, to test different methods of solving problems and efficient interpersonal decision-making, conflict solving, as well as using the available resources and evaluating.</p>	Team's first month functioning	<p>The objectives, activities, resources, the result indices and the activity evaluation methods are established for the robotics club of CNPRSV as stipulated in the club's program, approved by the school's principals.</p> <p>Along the 9 other clubs of the high school, it's established that this club will be integrated to the Saturday school, which will benefit from private financing (Raiffeisen) in order to build an outdoors site. The building of the site is ceased at the moment due to financial and weather difficulties.</p>
2.	<p>The training/the brainstorm This team's task is modulating the individual convictions and manifestations in order to make them compatible with those of the group to achieve the common objectives. Conflict is an opportunity for debate, for expressing ideas etc.</p>	Team's second month of functioning	<p>There are two major working directions:</p> <ol style="list-style-type: none"> 1. The team's internal structure (the microgroups' opinions are tested with three different methods) 2. The place of the ongoing activities is changed three times, as a result of three different suggestions (with complete relocation of the equipment). The final option is the one everyone has agreed on (the one that has all the necessary human conditions). <p>There are teambuilding and entertainment activities for passing time constructively.</p>
3.	<p>Building the trust Members of the group get to know the general way of working as well as the others' capacity to think about finalizing the objectives as a team, not as an individual. The members ensure help to each other in working towards finishing the activities</p>	Team's third month of functioning - first half	<p>The first stages of conceiving and building the robot begin. There is collaboration between the 4 functional departments of the team (design, hard, soft and PR). It also establishes the formalism of highlighting the work carried out - the standardized minutes. The first stable partnership is established, with the "Stefan cel Mare" University in Suceava.</p>



4.	Engagement In this stage, most of the team members no longer see the effort as an individual one, but as a team achievement. This way, they can claim an engagement towards the team and the leader, thus increasing productivity and the work dynamic.	Team's third month of functioning -second half	Due to the loaded school schedule, binding working intervals are set, and also that each member is presented to the workspace when time permits. It was found that this worked well, because the work continued exactly where it was left by the teammates.
5.	Community Team members are to respect each other, trust each other, thus being able to responsibly fulfill the objectives and being able to make decisions for the team's own good. The leader shows trust in the team and gives free will to the department coordinators in making decisions regarding the workload. This stage is characterized by: knowing and applying teamwork principles and appreciation mechanisms.	Fourth month	Regional stages are being prepared: Cluj, Iasi and Bucharest. There is confidence in the sub-teams that will represent the team at the regionals (in terms of representativeness, ability to handle the robot, not to damage it irretrievably, etc.). Department coordinators take decisions to modify relative technical solutions according to the realities on the ground. Changes in structure and function are made.
6.	Creativity By trusting each other, the team members feel free to discuss ideas and project approach possibilities. There are debates that are meant for the well-being of the individuals and the team, the completion of the work and company objectives, thus making the right medium for innovation. The leader encourages and motivates the team, recognizing its self-driving capability.	Fifth and sixth month	There are preparations for the FTC national and international level. The major confrontation of ideas is on the number of functions the robot must have / the quality of fulfilling some of them. The best solution is prepared for the national / international national.

Looking back from the moment we started preparing for this year's edition of FTC, we realized just how much we have learnt. We have all kinds of people in our team, from funny ones to talented and serious ones. There is not a single person in the team that does not stand out from the others in some way. But where each of us really shines, is the passion that we put into our work, into our relationships and ultimately, our lives. No matter who it is, we are all here for one reason and that is our passion for robotics and science. We are team Circuit Dealerz, all of us are students at the National College "Petru Rares" Suceava, and our robot is Shorty

Team #R0 044



Circuit Dealerz

2.CONTEST **PARTICIPATION**



Lasi Workshop

On 15th of December Matei and Andrei, accompanied by our mentor, headed to Lasi to take part in a presentation held by Anca Popescu, to discuss the core values of FIRST, this year's game and to answer any questions regarding the way to do things.

The big surprise was that on our invitation, the date was wrong. Only when we arrived at the hotel where the workshop was supposed to be held we found out that the whole event actually takes place on the 18th of December. With this occasion, Matei, Andrei and Mrs. Greculeac took a day off and decided to visit Lasi. This helped to improve the relationship between the mentor and the team members, and proved to be an important factor that got the team even closer together. Pizza, Starbucks and shopping in Palas Mall Lasi made up for the mistake on the invitation, so there was nothing to lose!

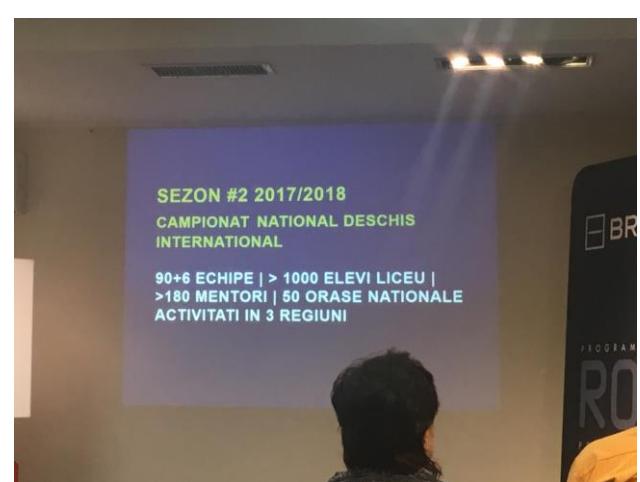
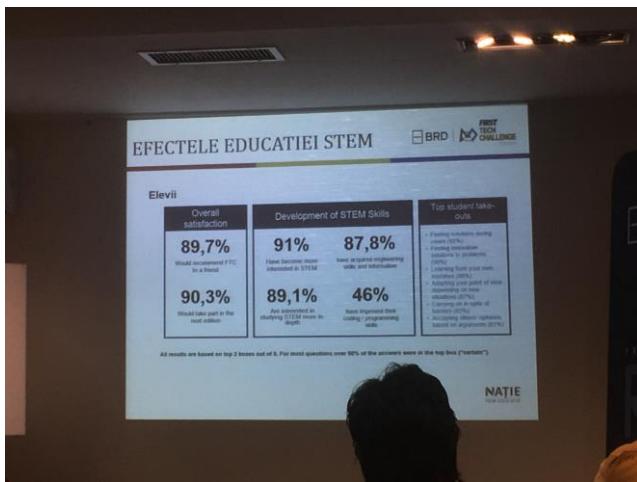




Three days later Matei and Andrei came back to the same hotel in Iasi, but this time all was set for the presentation to start. Everything started with a video message from the Director of FIRST Tech Challenge, Ken Johnson, expressing his excitement to see the bright ideas of the Romanian students taking part in this year's game and to encourage them to stick to the STEM community.



The event continued with a PowerPoint Presentation showing the statistic of this year's competition compared to last year's, proving that FIRST had an explosive growth in Romania with about 90 teams being involved compared to last year's 50. Also, the students that participated in the Velocity Vortex game, the first edition of FIRST Tech Challenge in Romania, said that after this experience they gained more confidence and skills in Physics, Science and Robotics, a domain that is not touched by the Romanian Educational System. The workshop in general was predominantly interactive, with the students constantly asking questions and trying to get involved as much as possible.





Towards the end of the workshop, Andrei Ciaramila from Debate ARDOR inspired and helped the teams on the speaking part of FIRST, concentrating on the interview that takes place before the proper competition, in which each member of the team has to describe his experience and how FIRST Tech Challenge helped him develop. He said that everything starts from an idea, and that errors and mistakes are inevitable, and most importantly, failures fuel the future success.



In the end, the teams had their chance to ask questions related to FIRST and the competition itself, and even got to interact with each other and even the organizers. Here started a beautiful friendship between us and Thobor, the team from Tecuci that proved to be very friendly, hardworking and skilled, despite the fact that this year is their first in the competition. Thobor assured us that they are willing to help us anytime through their members Alex and Rares, and they even stayed up until the very end with us to help the organizers clean up after the event.

After the presentation, the Palas Mall Iasi seemed too tempting not to be visited once more, so Matei and Andrei went back there, but this time with a clear objective in mind: to buy some suitable Christmas gifts for their dear ones.



Cluj Regional

The Cluj Regional was the first regional we attended this season, which meant that this was going to be the first time we tasted the true competitive atmosphere of FIRST Tech Challenge and test our robot in an actual match against proper opponents. All the preparations have been made, so the last day was allocated to the final tests before packing the robot. The movement code seemed alright, the claw did a good job to pick up the boxes and Compact Buffalo, the older brother of Shorty, was set to go. At the time we didn't have any time to implement our autonomous period code, so we were very scared not to make a bad first impression to the other teams.

We left on the 17th of February by bus, at 4 o'clock in the morning, with the help of our team's member Serban Martin whose father provided us with the bus and a driver to take us all the way to Cluj. The trip was long but not boring, because spending so much time together got us very close and we got to know each other even better. After numerous bathroom breaks, the first fulltime stop was at Dedeman in Cluj, because we needed to buy some pexiglas to cut out the protection walls of the robot so that we can put the sponsors and our team name and number on it. Also in Dedeman we signed a contract to borrow some tools, because having limited storage in the bus forced us to leave some tools at home.

When we arrived in the gym of the school where the Regional DEMO took place, we had a little desk to work on and signed with our name. We placed the pexiglas walls on the robot while listening to some great rock music, as a local band was playing in the front of the gym. We got a list with all the matches we had for the day, and even got enough time to spy a little on the other teams. We even got some help from the team Phoenix because we needed some tools as we could bring most of ours, and they were very kind to us and proved to be fairplay.

We encountered some problems at the beginning of the first games, because as we were told in the Robot Inspection, the phone was not compatible so we had a very big PING, which meant our robot couldn't even initialize properly. But we didn't let the disappointment bring us down, so all our attention was concentrated on getting Compact Buffalo back on his wheels and work as he did back at our place.

The problems continued to persist, but in the end we managed to find out what was holding the robot back! Matei had to do a complete revamp of the codes, Dragos changed the battery and the Hardware team corrected even the tiniest error. In one of our last games we managed to place a box and score 2 points! We knew that wasn't a that big of an accomplishment, but giving the conditions we worked in and how low our morale was, that little box brought back a little joy in our days and proved to be a huge step towards success.



We placed 19th in the DEMO, but we learned from our mistakes and we were grateful that we had this experience, so that we would know what not to do when the National contest in Bucharest takes place. We returned home with the same bus, but this time the trip seemed very short as we were sharing our honest opinions, our ideas to fix what didn't work that day and to get back on track.

But sadly that day was the same one we had to say goodbye to Compact Buffalo... Dragos and the 3D Design department came up with a new idea of a robot, a more efficient, faster and overall better one, and that's how Shorty appeared in our journey.



Bucharest Regional

Day 1

We ran some tests before packing the robot and catching the train to Bucharest. We boarded the train at 16:15 and started putting the finishing touches on the robot and evaluated what we should do in order to secure a good place at the regionals, as well as a ticket to the main tournament in America (at the nationals). On the train, many people showed extensive interest in our robot (including a business man, an university professor, two foreigners), so we explained them in a nutshell what FIRST stands for and what the competition is like.





After we finished the robot, we also played a few games which we knew, and which consisted on a rule and an action linked together, with the purpose of figuring out what that rule was. The two foreign girls found our struggle really funny and really entertaining. This way we started talking about each other and found out a lot things about them, including the fact that they were from Ukraine, although they spoke a little bit of Romanian. We took a picture together and we had a lot of fun during the trip together.

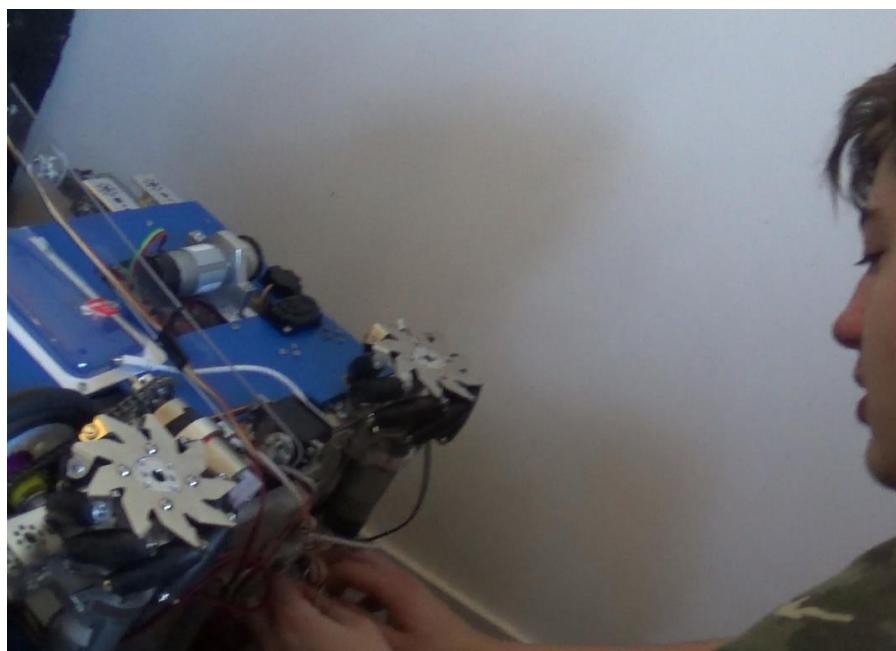


After we arrived at our hotel and checked-in, we decided we should go out and eat something. We couldn't choose a single place everyone would like, so we split into 2 groups and went to McDonalds and KFC respectively. Since it was almost closing time, we had to order takeout food and eat it in our hotel rooms.



Day 2

We woke up at around 8:00 and ate breakfast before starting to work on the robot. We checked the robot and we tried to improve its code.





When we entered the venue of the contest we were all anxious and stressed-out, because it was a relatively new experience for some of us and because of our lack of confidence in our robot, since the robot we brought at Bucharest couldn't really be called a finished product. Nonetheless, it was an experience from which we learned a lot about what it means to work in a real team, as well as how much each individual contributes to the team.

We were missing the Idol grabber and part of the autonomous period wasn't working. We also had problems with the batteries and the wiring, problems that proved to be really serious even in the first matches.

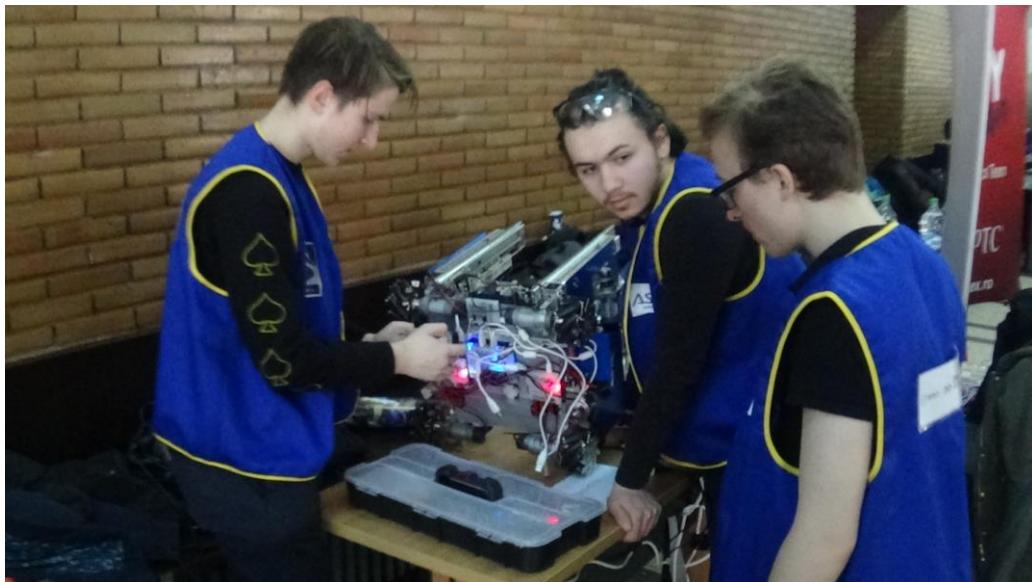
The Idol Grabber(liniar slide) was missing because we didn't take into consideration that we would need an engine in order for it to work properly (we already had 8 engines - the maximum ammount you can have on your robot) and we couldn't think of an efficient way to replace it with servos.





The autonomous period's code wasn't finished so our robot ended up on the balancing stone the whole 30 seconds.

We had to postpone our first match because the phone wasn't recognising the batteries. We were starting to panic because nothing we did worked and we were constantly being called to play our match. Another problem was due to the servos and engines being disorganised and not connected the way they were supposed to be to the main power.





We asked team AutoVortex if they can help us figure out what the problem was and how to fix it.



After we fixed batteries and organised the engines and servos, one of our wheels fell off during the match, so we had to fix that too.



At half-time we were on the 3rd place and the PR department had to attend the Notebook review, where everyone received feedback on what was good and what was wrong. The most important aspects mentioned were how to structure a notebook and what chapters it should contain (e.g A game strategy one, an outreach one, a business plan/marketing plan one).

After we repaired everything (around our last match), we discovered that the back wheels weren't working properly due to an error in the code of the robot.



We also befriended the team Army Bot's mascot (a student in camouflage desguise) and he agreed on taking a selfie with one of our driver.



At the end of the competition we placed on the 12th place, but we were still happy that we were on 3rd place during half-time and that we got praised for having a well-structured notebook.

We also took a photo with all the member who went to this regional, except our mentor, who had to catch the plane to Germany, because she was taking part in the European project Erasmus.





3. BUSINESS PLAN

AND ACCORDING ACHIEVEMENTS



I. Description of the activity

I. 1. Service / Product

The Robotics Club of « Petru Rares » National College Suceava is conceiving and implementing a training program for its members on different levels (scientific, practical, interpersonal and cultural). As a matter of fact, they « sell » a service to its members (that of interdisciplinary education with the purpose of developing trans-disciplinary abilities) and outside the club, it “sells the image”, which is necessary for the achievement of a wide and valuable base of selection.

Answering the question of why the students of the college would be interested in the services offered by the Robotics Club provided us with the following:

- Preparation for a future profession, considering the following statistics (and more)
 - Over 80% of the jobs provided between 2015 and 2025 require STEM abilities (Science, Technology, Engineering and Mathematics), according to estimates by National Science Foundation from 2014
 - A Romanian employer assesses on average 14 candidates for technical domains before finding the good one, and training an entry-level employee lasts about 8 months, according to a study carried out by Millward Brown in partnership with the Coalition for Romania's Development and e-jobs, in 2015, on a sample of over 400 companies
 - Romania trains young people for a future which is different from the one developed countries prepare for. The fiscal value of the IT industry in Romania has went beyond 5 billion euros in 2017 (it doubled over the last 6 years according to ARIES – The Romanian Association for Electronics and Software Industry Transylvania) and will continue to increase over the next years by more than 13%, according to ANIS (The Employers' Association for Software and Services Industry).
 - Also, according to ANIS, the shortage of IT candidates is today 40% (6 candidates per 10 new workplaces), and almost 60% of the Romanian 15-year-olds state that, in 2030, they would like to have a different profession from a technical one, so the need for specialists in the technical field is expected to increase.

-The need of the team members for a positive image in the educational community they belong to.

-The need for belonging to an elite group, in which their progress will be monitored.



I. 2. Position on the market

There are two types of markets:

-The market from which the Robotics Club of the college chooses its members, which is the community of students who want to be part of a club and participate in the selection every school year in September. The 10 clubs compete to select the human resources they are going to work with for at least another school year.

-The market of the external image of the clubs and members, which is important to fuel the first one, previously mentioned.

I.3. Opportunities for Development

The opportunities for the team's development are really high. The wish to be a member of the robotics club is ever-increasing, which is due to:

-The team's success in 2017 (under the name IMPULSIVE) by participating in the international competition FIRST, in St. Louis

-The team's partial results have created a wave of sympathy and have increased the students' eagerness to become members of the team in the future.

-Wide media coverage of the team's success

I.4. The objectives of developing the educational service provided by the Robotics Club

The working objectives of the Robotics Club are as follows:

-An increase in the quality of the education provided by "Petru Rares" National College to its students, in general, through the non-formal transcurricular educational approach

-The development of scientific, practical, teamwork and cultural abilities for the members of the Robotics Club

-An enhancement of the positive image of the education provided by our college in the local and regional community, with the purpose of selecting students who are motivated to learn and make an informed choice of a future career.

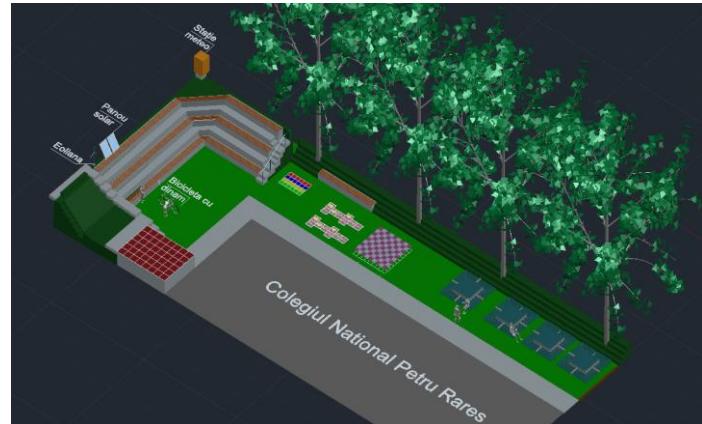
-The initiation of new institutional collaborations meant to create an economic chain, in which a few links should be educational (middle schools providing human resources to our college, also "Stefan cel Mare" University in Suceava, local companies based on engineering, IT and technology etc.)



II. Marketing Plan

I. Justifying the need to create and realize the objective of the project

- a. Describing the uniqueness of the project's objective (for example: the created/modernized/rehabilitated groundwork)
- b. The objective of the robotics club's existence is represented by the creating and functionality of a formalized microstructure in which the cross-curricular competences of the high school students can be developed, for the purposes of making them capable of approaching the future(university studies and labor market) and making them grow in the local community of this prestigious structure.
- c. The college has 4 real profile classes, specialization mathematics-informatics and 2 real profile classes, specialization natural science, for which there are conceived and conducted activities for the purpose of supporting the high school students to complete their knowledge and their developed abilities in a curricular way. The new information are helping the students, on the one hand, to integrate into a whole everything that they have learned at the specialized disciplines in school (mathematics, physics, informatics etc.) and on the other hand, it allows them to obtain new information and skills (new programming languages, teamwork experience, new ways of assuming responsibility and making decisions), which would prove useful in the future. At the same time, the students are creating positive attitudes in regards to approaching the future of technical jobs, given the restraint that young people show in embracing such jobs.
- d. The functioning of the robotics club Circuit Dealerz in the school year 2017-2018 allows:
 - ✓ The collaboration with the University "Stefan cel Mare" from Suceava for creating a local hub(with it's own location and volunteers to assist it)
 - ✓ The collaboration with the other clubs of the college(for example: the Inventions club, the NEXUS club) for arranging the educative park, situated in the immediate vicinity of the college(as seen in the picture)
 - ✓ Adoption of a new teamwork technique, which would make it more efficient, when comparing it to the one from last year.



➤ The analysis of the competitive market in the project implementation area:

There are two types of competitive activities that must be considered. The first type refers to the offer for extracurricular activities of the high school (the invention club, the NEXUS club, the subject-based excellence school, The Scientific "METAMORFOZE" (metamorphosis) School, the VIDEOART Club,



the English theatre club, the "Little Geographer's" club, the "Friends of nature" club, the bibliography club etc.), which makes the student's choices in extracurricular education diverge in more directions. The students with preoccupations in the science fields have, at the moment of registration (in September of each school year), a great number of choices. For this reason, it is essential that in the robotics club, the students that are more driven by multiple science domains are chosen, those who are willing to make effort and who have previous experience (even if minimal). These must be connected to the FIRST values, kept close to these values and to the rest of the team. The marketing plan must be conceived having this current state in mind.

The second type of competitive activity is the one represented by the presence of a great number of similar teams that will partake in the regional, national and possibly international competitions, on Romanian soil. These teams represent as many collaboration opportunities in the domain as well as competitive, the span of the regional confrontations, national or international. The marketing plan must take into account this collaboration/competition during all of the stages: the conception of the robot's design, the building of the robot, its practice, its training both outside and during the contests.

- The analysis of the array of services and products offered in the implementation area of the project:

The services offered by the robotics club to all of its members:

- the knowledge of conceiving a robot starting with the functions that it must have
- the knowledge of the actual assembly of the robot
- the knowledge of programming said robot
- the knowledge of improving the robot's structure and functionality
- Learning and performing a PR activity
- Learning to assume roles within the team
- Learning to mix the collaborative and competitive attitudes
- Learning the FIRST values

The services offered by the robotics club to the high school:

- opportunities for partnerships with various institutions and educational units (with the purpose of sharing expertise), as well as commercial groups and NGO's (for the logistic, financial and functional support for the club)
- the promotion of the high school's educational values and quality in the local and regional communities

The services offered by the robotics club to the local communities:

- the activity of the club contributes to a sense of pride and accomplishment, brought by the spread of the names of the city, the county, the region, as well as the country.



2. The SWOT analysis of the objective in the project's implementation area;

Elements will be described as follows:

- The level of accessibility to the created/modernized/rehabilitated objective:

-considering that the selection for the robotics team was made through an announcement on the high school's website, the rate of accessibility was 100%. Depending on the effort availability and the will to develop new skills, the team's composition has been established with the inclusion of 15 individuals (with the average age of 16), a mentor and a number of supporters, among which 7 junior pupils (12-13 yrs.)

-The hub is open to all the youth of the city, county, as well as region;

-the high school's educational park is open to its clubs, conforming to the external work sheet and in weekends, within the Saturday after-school program and for the external groups, based on booking, in every working day. The stage inside the amphitheater is an ideal place to train the robot, should the meteorological conditions allow it.

- Facilities offered within the implementation area:

-mentoring performed by adults

-technical assistance from the local university

- The fundamental SWOT analysis based on statistically relevant data, referring to the documents from which they were taken, as follows:



S (strong points)	W (weak points)
<ul style="list-style-type: none"> -the existence of previous experience and the possibility of further development (the mentor and two of the previous year members are present in the 2018 team) -the team's success in 2017, under the name "IMPULSIVE", (taken part in FIRST, St. Louis USA) is a mobilizing element for this year's team, among the wish to equate and go above the former team's performance -the students learn informatics (C++) as a primary school subject -the existence in the high school of a serious expertise in inventions, innovation, interdisciplinary teamwork (following exposure to external evaluation of the high school, it obtained the grade "EXCELENT" in the domains of <i>scientific research</i> and <i>extracurricular evaluation</i>) -the existence of the mentor's concern for the team to discover and implement new methods within the 	<ul style="list-style-type: none"> -the loaded school schedule of the students (7 hour per day of obligatory classes and at least 3 hours for redacting the homework) -the large size of the team (15 students) -the lack of an adequate space within the high school (every room is busy between the hours 8 and 20) and the adjacent spaces don't have the required size -the inexistence of a budget ensured by the high school for purchasing the materials, manufacturing the publicity, travelling to the contest area etc. -the inexistence of robotics (or similar subjects) as a school subject, dues to the theoretical nature of the high school
O (opportunities)	T (threats)
<ul style="list-style-type: none"> -the opening of the "Stefan cel Mare" University with the purpose of collaborating with the CIRCUIT DEALERZ team and the building and maintenance of the local hub -the sympathy and support from the parents of the CIRCUIT DEALERZ members under the form of allowing the allocation of time and money on the robotics domain -the existence of a national emulation of support and participation in the FIRST contests (regional, national, international). The experience of the FIRST TECH CHALLENGE brings robotics and learning through discovery in the schools of Romania, a project by "Natiile prin educatie". 	<ul style="list-style-type: none"> -the incompletely known costs, although estimates show high values required for the functioning of the robotics team -the reduced support possibilities from the financial institutions



3. Current analysis of the market

In order to select the students that will take part in the robotics club, the targeted market is represented by the students with preoccupations in domains like inventions, innovation, science etc., which aim to complete your knowledge in a systematic manner, as well as enjoyable. It is necessary to proceed with a serious audit of the ongoing activities' value within the club and coverage in the high school, as well as outside it, of the added value represented by the club's activity (presented in intellectual acquisition terms, work skills, attitude and results). A trustworthy source of information in this context is the reasoning behind the students' choice of this particular high school (The "Petru Rares" National College) over the others in the area, albeit similar in some domains, as a result of multiple science-oriented extracurricular activities being offered to them. Another source is the academic options of the high school's graduates (after 10 years of service in the scientific circles within the high school, there has been an increase in the number of students who chose university studies in domains like engineering).

➤ The positioning in the competitive medium

The positioning in the internal competitive medium is done using the focus strategy. The club focuses on the narrow segment of 10th grade students who already have results in the traditional contests in mathematics, informatics, physics etc. or that have taken part in scientific clubs belonging to The Children's Palace in Suceava. The typology of these students makes up the niche that the robotics club member selection is based on. If selecting a second team was needed, that one would not be as valuable as the previous. This means that the team selected first has the property of containing students of irreplaceable values and motivation. The request is made via the completion of a form and attachment of a CV and the actual selection is done by the mentor and by the previous year's team members.

*In the general theory of marketing it is specified that that the company/commercial society must be well aware of the niche segment that it establishes and of that **they must opt for either a domination strategy through costs or a domination strategy through differentiation**. In the first case, the company is specialized in a particular set of customers, looking to take a competitive cost advantage (it is either a big company and has the lowest market place because of the reduced production cost or a small company and sells small quantities to marginal clients, because in this way, the overall cost can be held down). In the second case, the company will select an exigent set of clients under the rate of the differentiation attributes: quality, post-sale service, used technology etc. It is to be avoided the standardized production and more sophisticated products are to be offered, which ensure a particular image to their owners (e.g. Rolls Royce, Mercedes). For this, the company will offer its clients an addition to the price that will go above the supplementary to ensure the*



differentiation characteristics on the products. So, the company will choose a domination cost strategy through differentiation on a market oriented towards differentiation attributes and a differentiation domination strategy on a market oriented towards the reduced cost of the offered products. The niche strategies are very good for companies that want to enter the market. Based on these, the company will take up a certain type of behavior towards the competition, adapted to the specific medium and internal potential, elaborating a particular strategy with some original elements. M. Porter avoids typical behavior as they risk becoming dysfunctional through banality, as a result of overuse.

The "CIRCUIT DEALERZ" robotics club is a niche one, based on differentiation, as the robotics club has a year since its founding. The "clients" are the students who are potential members of the club (in small numbers, compared to the other clubs of the high school), but that are willing to make a greater intellectual effort in conceiving fundraising activities, volunteering etc., much more than students in other clubs of the high school.

- The research type used: investigation of the statistical and/or collection of information through direct research

The research has used the data provided by the internal evaluation commission for educational quality, conducted by the "Petru Rares" National College Suceava, gathered based on the completion of electronic feedback forms at the end of the 2016-2017 school year (forms completed by both parent and student) and the data existent in the verbal report of the parents in 2016-2017. All this data tells us that one of the students' main motives for choosing to study at "Petru Rares" High School in Suceava is that this educational unit happily combines the formal education and the non-formal one and that the latter must be diversified and strengthened resource-wise in order to satisfy the ever-increasing number of requests from the students.

In September 2017 another focus group of the robotics team from the previous year was made under the name IMPULSIVE and the following were concluded: the club develops transversal skills (they don't stick to a specific subject or curricular area) that the students greatly need. This requirement has more dimensions: an ideational dimension (the students need support in order to integrate all that they learn into a whole), a practical dimension (students need to develop their ability to conceive, achieve and practice structures that require design, as much as actual handiwork), a social dimension (interaction within the team, role assignment) and a cultural dimension (developed through PR activities, volunteering, competitions etc.)



4. Establishing the general marketing objectives

In general marketing theory it is specified that marketing objectives must take into account the following:

- selling the existing products,
- commercializing of existent products on new market areas
- developing new products on new market areas.

And, in particular, there can be objectives based on advertising, human resources, prices etc. The objectives must be correlated to the results of the current situation analysis and fulfill the SMART model: Specific, measurable, achievable, realistic, on a certain timespan.

Thus, the objectives of this marketing plan are:

01. Integrally utilizing the expertise and equipment that the club has from the first year of activity in order to sustain, in proportion of 80%, its activity in the second year of finances.
02. Efficient internal structuring of the team, to ensure the achievement of the partial and general objectives of the club (a homogenous, motivated, with great transversal skills, a competitive robot, trained in at least 3 regional/national competitions)
03. Achieving local partnerships (at least 2), that would support the club's activity by intervening in the technical, logistical or organizational bumps.



5. Marketing strategies with the purpose of implementing the marketing plan's objectives.

The institution responsible with implementing the action plan is the "Petru Rares" High School of Suceava, through the person represented by the team's mentor, who is the vice-principal of the high school. The general responsibilities of the vice-principal are coordinating the non-formal education activities, and for this reason, coordinating the robotics club is a particularity of this position. The financing sources are represented by the saved budget from the previous year and the sponsorships from this year.

The marketing strategy is based on the 4P marketing mix (product/service, price/value, the selling and distribution strategy and advertising and PR strategies). As for the strategy regarding **product/service, the robotics club offers the following services:**

- the knowledge of conceiving a robot starting with the functions that it must have
- the knowledge of the actual assembly of the robot
- the knowledge of programming said robot
- the knowledge of improving the robot's structure and functionality
- Learning and performing a PR activity
- Learning to assume roles within the team
- Learning to mix the collaborative and competitive attitudes
- Learning the FIRST values

Why would a student of the high school want to take part in this club, more than others?

Because:

- even though it only has one year since its founding, it's an exclusivist club, of local notoriety, won by partaking in the first competition in 2017 in St. Louis, USA;
- The team's size can be much greater than the invention team (where the teams are in groups of 2-3); this can also be a disadvantage if mishandled;
- work and fun are combined
- the possibility of a flexible work schedule;
- There is a mentoring activity (remotely, through the web or up front with the mentor and the supporters)
- the type of ongoing activity (alternating between doing by learning with learning by doing)
- the finality of partaking in the club's activities is one superior to the other clubs (developed skills are multiple and diverse and they can be valued *immediately*, through the participation in the regional, national and international contests, but also *over time* through various other activities)



- the ruleset for participating in profile contests imposes the strict crossing of all steps and the testing of that crossing (selecting human resources, activity planning, achieving the activity, continuous evaluation, improvement, competition and collaboration as well as final audition)
- the club has identity elements that the members decide (name, logo design elements etc), while all the other clubs are fully controlled by the coordinating teacher.

As for the **price**, it's based on the value that the team receives for the offered educational service. This value is greater than other clubs of the high school. Unfortunately, it cannot be directly measured, but can be indirectly estimated through:

- the quality of the application portfolios within the selection process of the team members
- the time that the students are willing to spend working with the team (e.g. in the weekend, about 3 hours a day and in vacations 4 hours a day)
- the financial effort that the students' families are willing to make to support the club's activities;
- the great number of adult supporters that the team has found, compared to other clubs
- the team's ability to convince and the ingenuity, especially in the PR domain; This was proven when there were fundraising activities taking place (a letter was sent to the Christmas charity event and were convinced to donate us a part of the money with the promise to successfully represent the high school).

The offered service (or non-formal education) is a very flexible one, being able to adapt to the student's needs and accepting their work rhythm and the symbiosis with the school schedule. This is another strong point of the club, which leads to the increase in the "price" of this service.

The consumer isn't, however, very sensitive to the price, considering it's a breach service.

The costs of performing activities in the robotics club, however, are great. Working materials include original pieces from the USA and the printed pieces are kept at a minimum, considering these were the first to fail at the national competition. The effort is great from both the students and the mentor with the external support because the activities are demanding, but offer more satisfaction.

In order to affix the price for the activities of the robotics club, some constraints must be taken into account (at the age of 16, the high intellectual capacity is not developed enough and the base lessons in some subjects have not been taught yet), the school rule set, which imposes a limitation to the activity hours, in accord with the approved activity plan of the club, the minimal space that the high school can offer (until December, the workplace of the club has been changed 3 times) etc. Whatever this price is, the members of the club are willing to pay.

In what regards the "**sales and distribution**" (the sale methods and distribution channels) it is taken into account that only members of the high school can become members of the club, with previous achievements in a science field. This must be stated ahead of time so that willing students have time to



prepare said achievements. Also, the skills are "sold" by participating at a great number of regional/national/international competitions and through the mentor activity that they proceed in with the junior team (supporters of the current team, only 12 years of age, who are allowed to assist the meetings of the club). The distribution channels are represented by the one mentioned in the contests' rules.

In regards to the **advertising and public relations** it is established which are the desired effects in the adverts (the increase in the students' wish to become part of the club, as well as the motivation to work more towards the teamwork side). The estimated advertising costs are 10400 RON. The message to which the wanted effects will be attributed to is "Team CIRCUIT DEALERZ will stand above last year's team".

Two advertising directions are considered:

-**the services advertising**, which is done through all available means to inform and orient the clients towards the services that the club offers (non-formal, cross-curricular education, in an organized medium, that takes into account the wishes, expertise, time resources and effort of its members).

The advertising has two purposes

1. *the selection of new members* (done in the first trimester of 2018 only if CIRCUIT DEALERZ is incomplete), but mandatory conducted in September 2018 in order to compete in 2019
2. *additional motivation of the current members*

The main advertising channels for the club's education are:

- the ADSERVIO platform, a method of communication between students, parents and teachers. Through the newsletter, the parents are made aware once or twice a month of the club's activities and progress
- the high school's site, through information about notable achievements, in the news section
- the club's Facebook page, through occasional posts
- partaking in TV or radio shows (at least once per month) of the team, or its representatives
- the visibility forms of the structures in which the robotics club performs volunteering activities (members of CIRCUIT DEALERZ have done volunteering work to restore the high school's educational park in its proximity. The financer of this park has thus congratulated the team and advertised it through their own structures).



-the documents signed by the robotics club's representatives, for instance, by the mentor (partnership offers, volunteering offers etc.), which will include marketing elements. These documents are information sources meant for data analysis, internal and external evaluations etc. and for this reason, they will be advertising vectors for the robotics club.

The advertising will follow the club's activity, who, by moving on its principle "from simple to complex", will allow a possible future member of the club to catch up and learn of the compatibilities with his activities and aspirations.

-the advertising of the "sales" - through the assembly of the actions and means of catching the attention of possible "buyers". CIRCUIT DEALERZ doesn't actually sell anything, but promotes the experience of its members, encouraging them to form their disciples and partake in as many contests as possible. These participations are attributed to advertising events, organized by the club's PR team (posters, flyers, information at the competition stands etc.)



6. The action plan for implementing the market strategies

The proposed actions in order to achieve the marketing plan's objectives are present in the table which displays the marketing budget, with specific details. Also, it contains the time period and the department/person responsible. The general responsible of all the activities is the student coordinator and the team mentor

7. The budget of the business plan



No	Action	Sub-action	Oct	Nov	Dec	Jan	Feb	March	Resp.	Budget
1	Market research	Interpreting the data provided by CEAC, the survey in the Freshmen's school etc, Result - relevant statistical data	x						Mentor	-
2	Communication	Posting information on the high school's site, for informational and motivational purposes. Result - stimulating the participation to the selection, increasing the sympathy of the supporters	x	x	x	x			PR	-
		Redacting the newsletters for Adservio. Result - increasing the supporter's sympathy	x	x	x	x	x	x	PR	-
		Redacting and posting on Facebook to inform and motivate Result - stimulating the participation to the selection, increasing the sympathy of the supporters	x	x	x	x	x	x	PR	
		Progressive redaction of the team's notebook and publication in two variants Result - public awareness of the club's activities	x	x	x	x	x	x	PR	1.000 RON
		Redacting promotional materials of the team for participating in FTC Result - the club's promotion in the FIRST community	x	x	x	x	x	x	PR	8.000 RON
		Sending the sponsorship letters. Result - obtaining sponsorships	x	x	x	x			PR	-
		Sending sponsorship contracts to "Stefan cel Mare" university and other such local institutions Result - easy access to high level expertise	x	x					Mentor	-
		Redacting volunteering papers for the members of the club Result - Advertising for the team	x	x	x				Mentor	-
		Redacting and sending activity reports to sponsors and partners Result - increased sympathy for the club						x	Mentor	200 RON



		Organizing a press conference before the FIRST national contest. Result- advertising the club's success in the final stages of the national contest				x	x	Mentor	1.000 RON
3	Event Organizing	Partaking TV shows that will discuss CIRCUIT DEALREZ's club activity Result - Local promotion and support requests	x	x	x	x	x	PR	200 RON
4		Testing the entire PR activity. Result- pointing out the weak points, which will be used as beacons for the next activity					x	Whole team	-
Total									10.400 RON



III. Production Plan

III. 1. Goods or services?

The Robotics Club offers a complex educational service to its members. This service implies several aspects:

- ✓ The development of cross-curricular abilities in students (skills based on information and research, on searching for answers to questions, assertive communication, role-play, learning how to conceive and implement a project, learning study and innovation techniques, learning how to boost self-esteem based on value and the respect of the group you belong to in community, learning how to promote your own image, learning resource management etc.).
- ✓ The development of STEM abilities, to be later used on the job market
- ✓ The adjustment of personal deficiencies (e.g. the need for efficient time management, for order, for respecting strict rules and deadlines etc.)

III. 2. What direct benefits are brought to the consumer of said good/service?

- By using the educational service provided by the club, its members experience an increase in:
- The ability to perform self-discovery and become aware of their strong and weak points, respectively, as well as self-esteem and respect from others.
- The degree of safety as a result of belonging to an organized elite group.
- The amount of information in the field of STEM.
- The ability to incorporate knowledge by putting it into practice.
- The ability to positively interact inside groups.-The level of ethical, social and citizenship abilities (manifested, for instance through the wish to partake in and to find solutions to the problems which the society supporting them has to deal with)
- "Petru Rares" National College Suceava is to increase its positive image in connection to the quality of the education it provides



III.3. What are the characteristics of the product/service?

The educational service provided by the Robotics Club is:

- Available on demand (the students apply to become members)
- Flexible (the activities are customized according to the individual growth psychological needs, identified within the initial psychological test, and smaller groups are made in which the total value of the abilities is relatively constant, supporting inter-studying)
- High quality (the abilities developed within the club's activities are far beyond the required level for 16-year-olds, the average age of the group members)
- Supported by the school (e.g. by offering the club an appropriate space for which the school pays for all the utilities)
- Well promoted with the help of its own PR team.

III.4. What additional services are offered along with the educational service of the Robotics Club?

The additional services are:

- A guarantee of functionality of the same team for at least one school year
- A guarantee of participating in the regional and national FIRST competitions
- A guarantee of pardoning absences due to the students' participation in competitions and organized activities
- A guarantee of including the annual activity report of the club in the annual report of the college to the school Inspection Board, the parents' association and the traditional partners, with which the college signed collaboration protocols.

III.5. The “production” stages

Finalizing the lawful operation of the Robotics Club by receiving approval of the curriculum, schedule and list of members of the club by the school head teacher

- Solving the problem of finding a venue for the activities.
- Testing the team members by the college psychologist.
- Identifying the individual needs for personal development of the club members.
- Organizing smaller groups (4), considering the students' wishes and their psychological structure. There will be 3 successive steps in organizing the club (a flat structure, a dual structure and a pyramid structure, to be tested and decided upon the most efficient one)
- carrying out teambuilding activities with the team



- organizing activities to promote the team, according to the marketing plan
- signing partnerships and collaboration agreements (e.g. USV)
- participating in courses and webinars
- planning and organizing the activities for each small group
- performing the activities inside the small groups with a focus on innovation, achieving the interaction between the small groups.
- devising several prototypes of final products for each small group and testing them, choosing the ones that comply with the requests of the beneficiary through the students' and the supporters' votes, the ones which get the best results in local competitions.
- Assessing the progress of the team as a singular functional structure, and of the extent to which the personal weaknesses have diminished
- Performing activities to reduce the costs (e.g. Printing some elements or producing them instead of the originals)
- Estimating the costs for the team on each stage, devising the budget for income and expenses, leveling the budget if this is too low through intensive fundraising, or a loan from the parents' association.
- Estimating the "production costs", a tedious process, because the educational service takes one school year, although the estimated value is above 3000 euros by 19th of March.
- Using at least 3 channels to simultaneously promote the existence and achievements of the team, so that the current supporters and the future members could make the minimum effort to come into contact with the information regarding robotics in the college



IV. Management Plan

IV.1. Organizing the Robotics Club

The robotics club is structured in the form of an organization that operates on the basis of efficiency, so as to maximize useful effects by minimizing efforts. This is done by working in small steps, discussing the tasks at each stage, analyzing the inputs and outputs by estimating the resources for each step (time, material and financial resources within each team, the student coordinator team and mentor being present) and the expected results for each stage and each sub-team.

Within a flat organizational structure, all students collaborate to accomplish the same task. They are at the same time at the club and work together. Usually, students learn a lot from each other, but the progress in making the final products is rather slow.

Within the collaborative and competitive organizational structure, the team is divided into two sub-teams that each have 4 internal structures (design, hard, soft and PR). They receive the same task at the same time, accomplish them in parallel, and the finest final products are assumed by the whole team, discarding the less optimal performers. This is the competitive collaboration method, which involves the alternation of the diverging stages with the convergent ones, in order to increase the team's continuous performance. The method is published by the team mentor and practiced in more than 10 years of running the College's School of Inventions. It is described in a separate chapter.

Within the pyramid structure, each sub-team is organized vertically on at least 3 levels. Each sub-team has a coordinator, and the coordinator of the entire team has a double role (sub-team coordinator). Organizing within the sub-teams is different depending on the task each person performs. Thus, within the PR sub-group, two different structures are functioning. One is actually working to promote the image of the robotics club and another to fund-raising. But within the other sub-teams, they are working together, but each reports to the next level what has succeeded and what it has failed to do. The mentor receives information in general from the coordinators of the 4 sub-teams.

All three structures will be practiced and the most fruitful of them (in satisfying the students' expectations), along with the team's development stages, will be generalized and will make the frame in which the club in 2018-2019 will be evaluated.

No matter the internal structure of the team, the most important of all is that each student develops, feels accomplished through what they do in the club, continuously improve their capabilities and that in the club there is a positive, motivating climate that would allow the building of trust between the



members. These will be encouraged to innovate and validate their "market" value of their innovations. Responsible for all these is the team mentor.

IV.2. Planning

The team's vision "Let's be better today than we were yesterday, so tomorrow we can be valuable on the job market".

The mission of the team is to build a team of valuable scientific and interrelated weld able to manage their internal problems and to interact positively with the external environment in order to get as high as possible in the FIRST 2018 competition.

The succession of activities of the robotics club, equated in the final material products, which correspond to the competencies needed to accomplish those tasks are:



No.	Activity	Workplace/Person in charge	Deadline/Period
1.	Creating a team, choosing the representative elements (name, logo, motto)	Physics lab 35 Mentor	October 2017
2.	Establishing responsibilities within the team (3D modeling, hardware, software, PR)	Physics lab 35 Mentor	October 2017
3.	Team registration in FIRST - Romania competition	Mentor	November 2017
4.	Building the communication strategy between the CIRCUIT DEALERZ team and the local community	Physics lab 35 Mentor and PR department	November 2017
5.	Subgroup work meetings (4 subgroups) for the design of the robot, its construction, its intelligence endowment and the implementation of the communication program with the local community	Physics lab 35, practice on the educational park scene Coordinators of the 4 subgroups	November – December 2017 – January 2018
6.	Participating in various local competitions to test and train the robot	Iasi, Cluj, Timisoara, Bucharest / Mentor	February – March 2018
7.	Participation in the FIRST Romania national competition, March 2018	Bucharest Mentor	March 2018
8.	Participation in FIRST -SUA 2018	USA	April 2018
9.	Dissemination of the experience and results obtained by the CIRCUIT DEALERZ team in the year 2017-2018	Demonstrations on the educational park's scene Mentor / PR	May 2018

IV.3. Leadership

The governing style of the robotics club is one that is imposed by the following limitations:

- Compliance with school legislation
- Observing the stages of the activities and the imposed deadlines
- Concern over the limitations imposed by existing resources
- The limits imposed by individual and team progress.



It's a permissive style with the previously mentioned limitations. If these limitations are exceeded, then the style becomes authoritative. There are two poles of authority: mentor and student co-ordinator.

IV.4. Decision-making mechanism

Decisions are taken democratically within the team. The mentor has the necessary experience to bring value arguments so as to influence the renunciation of decisions that:

- would lead to erroneous technical solutions
- would be more resource-intensive
- would have little or no educational value
- would block the activity of the team or create tensions within the team.

The decision-making mechanisms are:

- the direct, reasoned vote
- deterministic analysis of the decision. Judging retrospectively, the following steps were taken to establish the internal structure of the team:
 - a). problem formulation - What internal structure is better for the team?
 - b). establishing a coefficient of importance for each criterion:
 - Scientific / Technical Criterion, Importance k = 4
 - Economic Criterion, Importance k = 3
 - The criterion of team progress as a group k = 2
 - The inter relational criterion, importance k = 1
 - c). the technical justification of the decision - the determination of the decision method (e.g. summation method)

For each criterion, a rank is given (rank 1 of the most advantageous and progressive ranks for the other variants).

- d). drawing up the matrix of consequences by including rankings
- e). interpretation of the result - Under the conditions outlined above, the optimal option for decision is variant three.



Criterions Variants	Scientific/ Technical Criterion	Economic Criterion	Interrelational criterion (e.g. friends)	Group Criterion	Summary of Rankings
Flat team structure	2	2	2	1	$4 \times 2 + 2 \times 3 + 2 \times 1 + 2 \times 1 = 18$
Competitive collaborative structure	1	3	1	3	$4 \times 1 + 3 \times 2 + 1 \times 2 + 2 \times 1 = 20$
The pyramidal structure	3	1	3	2	$4 \times 3 + 3 \times 1 + 1 \times 3 + 2 \times 2 = 22$
Coefficient of importance k	4	3	1	2	-

It has thus been established that the pyramidal structure is the one that best suits the team.

IV.5. Control and continuous improvement of activity

The prevention of malfunctions is based on the "It is easier to prevent than to treat". When there are indications that things would not work well, analyzes will be made of deviations from the optimal exercise of roles within the team or from excessive consumption of resources, from missing deadlines, or from constructive relationship within the team, for obtaining a relevant quantification of dysfunctions (breaks in the exercise of functions). If these dysfunctions are serious or are expected to be serious and have frequent occurrences, corrective action should be taken. These are processes for returning to situations prior to the occurrence of dysfunctions. It is preferable to carry out analyzes such as those described before the effects are irreversible.

V. Financial plan

The financial strategy of the team is to ensure both the financial functioning of the team and the investment in the sustainability of its operation.

The investment goals to ensure the sustainability of its operation are as follows:

- a). team members' loyalty through team co-activities (this year's members will remain members until next year to become centers of future expertise, even if 2 of them will be in the terminal next year and prepare for the baccalaureate exam), therefore entertainment costs should be considered.
- b). carrying out activities that correspond to the personal and professional development needs of the team members, which contribute to creating the certainty that through the robotic activities the pupils construct their knowledge in the future, so it is possible to foresee expenses for checking the scientific, technical, personal development etc. of the team.



- c). creating a nursery among middle school students wishing to become members of the high school robotics team, so one can predict social spending with younger students
- d). creating a positive image in the local community about the existence and results of the robotics team, an image that will help to increase the students' desire to become pupils of the "Petru Rares" National College Suceava, so it is necessary to have a budget managed by the PR team.

V.1 Income

The main source of income for the team:

-fundraising/ persuading entrepreneurs to become sponsors of the team.

The goals of raising funds are:

- a). loyalty to the entrepreneurs who supported the team last year (e.g. SC ASSIST SOFTWARE SRL)
- b). the conviction of an entrepreneur to become the main sponsor - still unsuccessful, but there are promises from SC ASSIST SOFTWARE SRL
- c). convince an entrepreneur to combine financial support with ensuring a specialized logistics - work done with SC. ASSIST SOFTWARE SRL
- d). conducting a genuine fundraising campaign in accordance with its rules so that the financiers are reached by the FIRST values and convinced of the quality of the team seen as the FIRST ambassador, and financial support is to be made as a result of these beliefs and not of other motivations (exponents of the parents support the team because their own children are members of the team etc.)

The team's financiers until March 20, 2018 were:

a). EXCEPPIOR Association of Parents' Students of Petru Rares National College in Suceava - 4.000 lei 1050 USD		
b). SOUVLAKI AKROPOLI SRL - 200 lei	-	52 USD
c). SC JOLIEPAN SRL - 300 lei	-	79 USD
d). SC GLASS GSM MOBILE SRL - 200 lei	-	52 USD
e). SC GENA CONT SRL - 200 lei	-	52 USD
f). PRONTO PIZZA SRL - 50 lei	-	13 USD
g). SC BUCOVINA TURISM SEVERIN SA - 500 lei	-	131 USD
h). SC EXPRESS EUROSCAN SRL - 1.000 lei	-	262 USD
i). SC. IONESI RODICA, Radauti, - 2.000 lei	-	525 USD
j). SC ASSIST SOFTWARE SRL - 1.000 lei	-	262 USD
h). Individual MIRON NICOLAE - 2.300 lei	-	604 USD

Total: 11.750 lei - 3094 USD



V.2 Expenses

Expenses until March 20, 2018 were:

a) The first order of parts from the US	-	830 lei	-	218 USD
b) The second order of parts from the US	-	3300 lei	-	866 USD
c) Partaking in the regionals	-	2170 lei	-	571 USD
d) Payment in advance of participation in the national	-	2300 lei	-	605 USD
e) Participation in the national stage	-	1200 lei	-	316 USD
f) Sustainability costs of the team	-	800 lei	-	210 USD
g) T-Shirts, Flyers and other expenses	-	1300lei	-	342 USD
h) Material bought from Dedeman	-	300lei	-	79 USD
Total :	12.100lei	-	3188 USD	



4. OUR TEAM

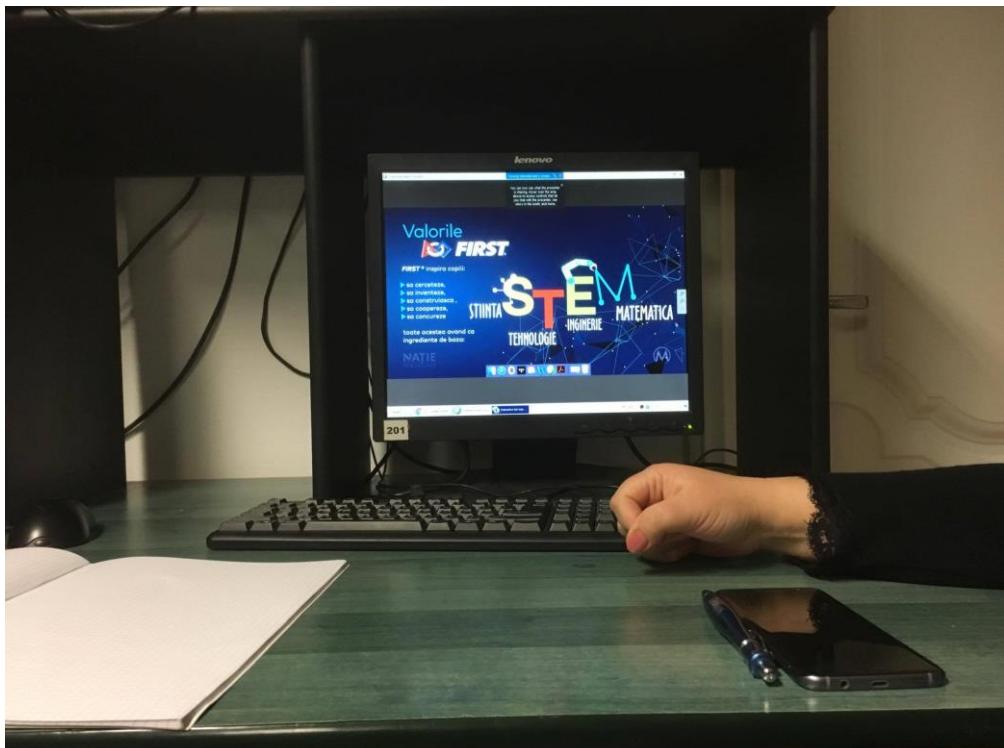
IN CONNECTION WITH



Promoting FIRST programs

The first webinar

Before being able to promote the FIRST values, we had to first learn about them. For this reason, the mentor of team Dark Angles, Cristian Vlasceanu presented how the ideal team should be like and what the purpose of the competition is, on an online screen-sharing platform.



We were first presented with the core values of FIRST as well as the concept of Gracious Professionalism, which is something that should be present in our day-to-day lives and not just during the competition.

STEM (Science, Technology, Engineering, Mathematics) also plays a big role due to the nature of the competition, which showcases robots (the result of combining all of STEM's components).

He also told us about FTC Romania: It is comprised of 4 regionals (Iasi, Cluj, Timisoara and Bucharest) and one national (in Bucharest); the winners of the national will go to the international competition in the United States, Detroit.



He continued with how a mentor should be and what his purpose is. The mentor is supposed to be the ideal combination between a coach, teacher, student, guide and psychologist. He guides, inspires, encourages, advises the students. The mentor must set clear goals for the team and also evaluate their progress. The mentor should advise and not impose on decisions, so students can experiment, test and draw their own conclusions from their ideas.



The last part of the presentation consisted of the Engineering Notebook and the according prizes. The notebook can be in 2 formats, handwritten or electronic and should contain the journey of the team with all its successes and failures. It must include certain chapter such as Community Outreach (which refers to promoting and encouraging the local community, as well as increasing the team's fame) and Financing (everyone can contribute to the team: parents, friends, the city hall, the local community)



We concluded that what matters is:

1. The students, and not the robot
2. The road travelled by the members
3. Developing new skills and abilities
4. The opportunity to participate in a unified team
5. The pride of taking part in the FIRST and STEM communities.



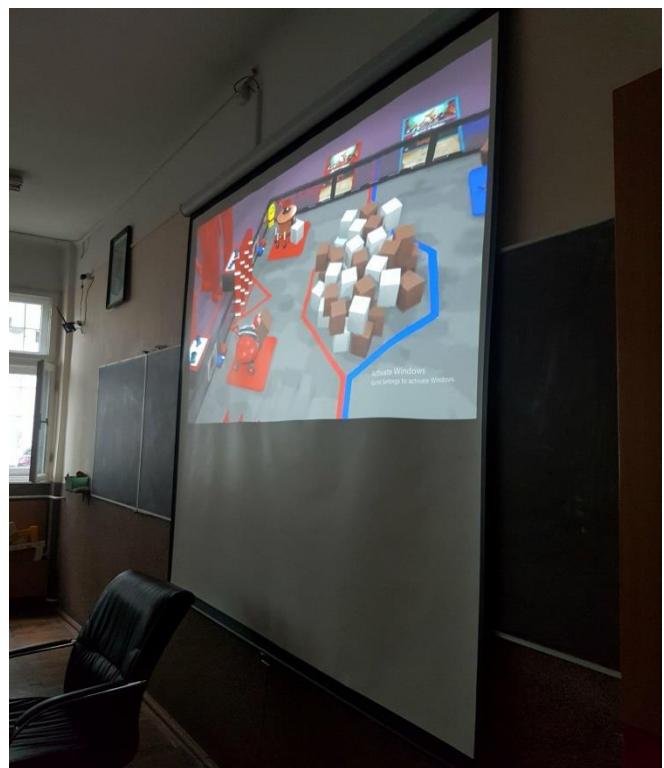
Inspiring young students

We decided to do a presentation for the 7th graders in our school. In the presentation we talked about FIRST values, FTC: RELIC RECOVERY, our team and our achievements. The purpose of the presentation was to assure the fact that younger generations will be interested in joining the team and the STEM community in general, as well as further promoting the FIRST values.

We started the presentation by introducing ourselves and the team to the class and then we presented what FIRST is (For Inspiration and Recognition of Science and Technology) and what it stands for, by presenting the Eight Core Values of FIRST:

1. We are a team
2. We do the work to find solutions with guidance from our coaches and mentors
3. We know our coaches and mentors don't have all the answer; we learn together
4. We honor the spirit of friendly competition
5. What we discover is more important than what we win
6. We share our experiences with others
7. We display Gracious Professionalism and Coopertition in everything we do
8. We have FUN!

Then we continued with the presentation of FTC: RELIC RECOVERY. They were fascinated with the video presentation of the game. At the end of the video presentation we received questions about the competition (for example: When and where it's taking place? What have you achieved so far?)





Following this, we wrote the pointing system of the game on the blackboard and asked them if they can figure out a good strategy.

They thought of a good strategy which is similar to the ones mentioned in the Game Strategy Chapter of the Notebook.

We showed them the photos with the competitions we've been in so far (the Cluj and Bucharest Regionals), photos which portrayed the atmosphere and the essence of the contest: we showed them lively and passionate people creating robots for the purpose of playing a game while developing the teamwork of the group as well as individual skills, all while meeting new people and having a lot of fun.



Team #RO 044

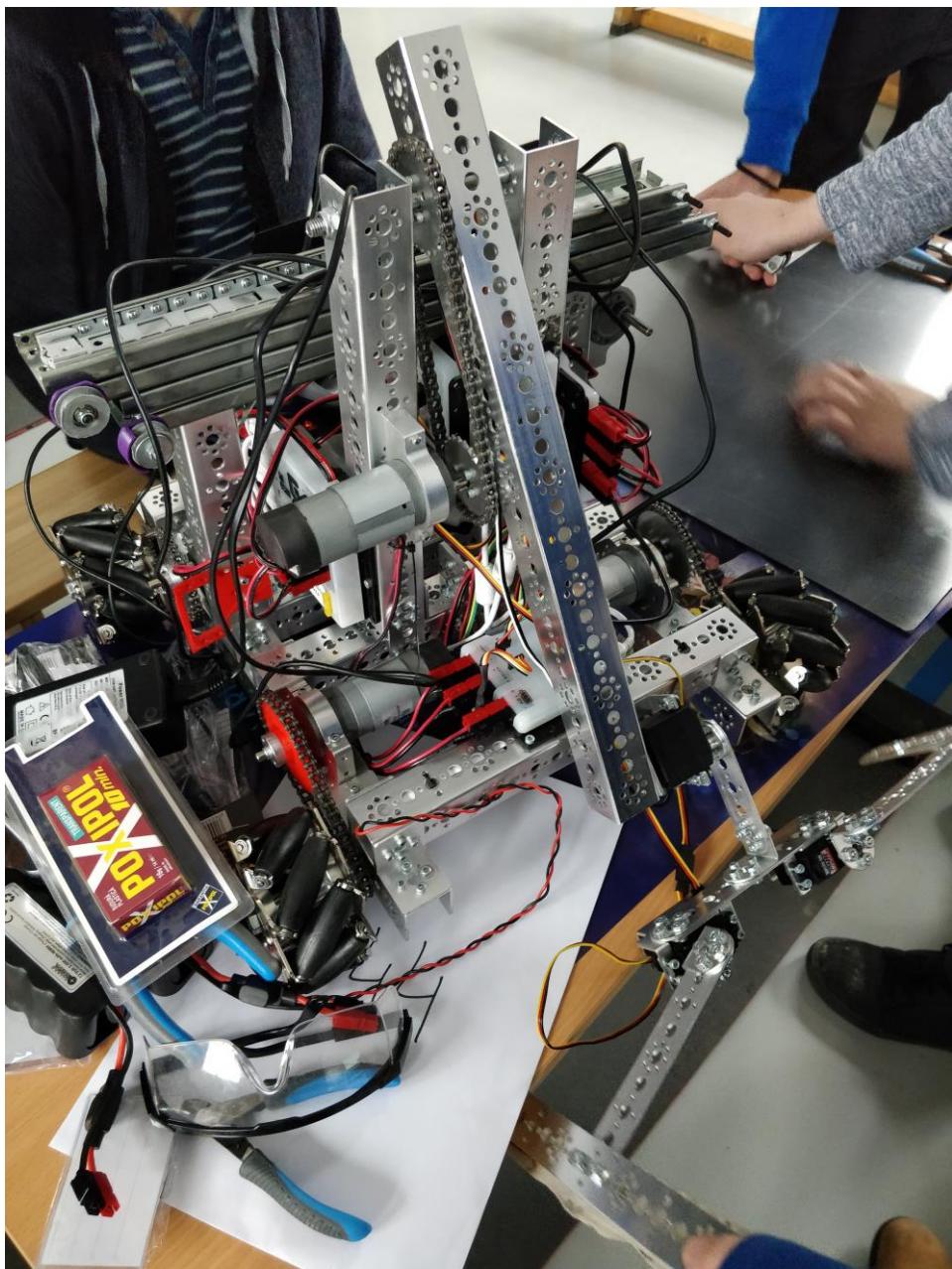


Circuit Dealerz





We presented them the designs of our robot as well as the changes it suffered over time, in order to reach the current design. The class asked question like why the robot doesn't look another way, or behaves another way, what engines we are allowed to use or if there are any other restrictions on the robot. Two of the pupils showed extensive interest in the competition and had knowledge regarding the robotics and could pinpoint the flaws of the first design, flaws which we hadn't realized until later. It surprised us to find out that there was someone so passionate about robotics, and at such a young age too.





At the end of our presentation, we showed everyone the copy of the Engineering Notebook we had at Bucharest. It was interesting for them because the robot's schematics seemed interesting and exciting and the pictures were bright and energetic.

After we finished what we had in mind, we talked more about FIRST with the two boys, and they told us about the competitions they were participating in (e.g. ISWEEP, and ROSEF). Because we only had a limited time to talk to them, we didn't talk about everything we wanted to, but they promised that they would find more time to talk and maybe decide to participate in the next year's FTC.

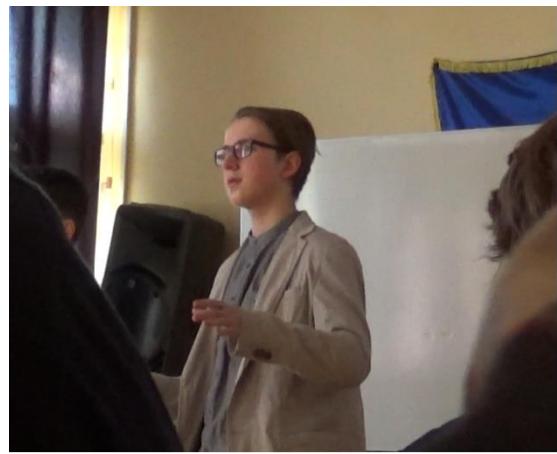


Auditorium presentation

With the occasion of a presentation made by the multinational company Pentalog, 3 representatives of team Circuit Dealerz (2 of them were from the last year's team Tudor Andronic and Alex Hantescu and the other one was our current team leader, Dragos Salagean) presented their achievements (a spot in the tournament in St. Louise) and certain decision(for example: the reason for changing the design of the robot before the international stage of the competition, and the reason they quit the team) in the last edition of FTC.



Following this, Dragos began talking about this year's competition, and a short presentation of its rules and the current team's progress and achievements.





Other projects

In order to promote the values and the type of FIRST competition collaboration and the presentation of the example of good practice in completing the formal education with the nonformal education, carried out within the robotics circle, the team performed the following activities:

Team mentor:

1. She was lecturer of the adult education course in Suceava, within the framework of the Erasmus + KA2 project "Cooperative Innovative Versi Interdisciplinarité Civique [CIVIC]", European code 2017-1-FR01-KA219-037281_2, site <https://projetocivic.wordpress.com> The mentor's intervention referred to the methods of civic competence training in pupils through extracurricular activities, the example of good practice being that of the robotics club. The intervention was appreciated by all participants in the course. No teacher was aware of the FIRST values and competition. Course participants were from the following high schools / countries :
 - "Petru Rares" National College Suceava (Suceava - Romania)
 - Istituto tecnico economico statale " Jacopo Barozzi" (Modena- Italie)
 - Liceo Classico Stabili Trebbiani (Ascoli Piceno - Italie)
 - XV Liceum Ogólnokształcące im. Narcyzy Zmichowskiej (Warszawa - Pologne)
 - Zespol Szkol Ogólnokształcących nr 2 w Jeleniej Górze (Jelenia Góra - Pologne)
 - Lycée Professionnel Auguste Bouvet (Romans sur Isère - France)
 - Escola Secundária de Felgueiras (Felgueiras - Portugal)
2. She presented the entire mentoring experience of the robotics team of the "Petru Rares" National College of Suceava at the Managerial Meeting of all high school and college directors in Suceava County on December 7, 2017. The title of the intervention was "Operational management of institutional management by assuming roles in the school unit ". Each participant received a CD containing all the interventions. The number of participants was 44 executives.





3. She was a lecturer and trainer at the MARIAN DACIAN BICA winter camp, held in Voronet, 3-10 February, contest included in the Calendar of National Extrascolative Activities of the Ministry of National Education for 2017-2018, presenting the use of the notions of physics in building a possible robot.



Nr. 630/07.02.2018
ADRESEREA
Se adreseaza președintele și membrilor Consiliului școlar
de la Colegiul Național "PETRU RAREȘ" Suceava
a participa în cadrul de proiect biserici, în perioada 3 - 10 februarie 2018, la activitatea din cadrul
Temeiului "BUCURIILE DE VITĂ ÎN CĂRȚI" și încheierea acestuia, Consiliul școlar al Colegiului Național
"MARIAN DACIAN BICA" și Consiliul școlar al Colegiului Național "PETRU RAREȘ" Suceava, în cadrul
BICAV, desfășură în localitatea Voroneț, județul Suceava, eveniment inclus în Calendarul
Autumnal al activităților de promovare a cunoașterii și dezvoltării culturale și științifice ale elevilor.
Acest eveniment are ca scop, de promovare și cunoaștere în cadrul acestor activități Consiliul Național
"MARIAN DACIAN BICA" și Consiliul școlar al Colegiului Național "PETRU RAREȘ" Suceava, în cadrul
BICAV, desfășură în localitatea Voroneț, județul Suceava, eveniment inclus în Calendarul
Autumnal al activităților de promovare a cunoașterii și dezvoltării culturale și științifice ale elevilor.
Prezentul adreseu se referă pentru completearea documentului personal.

Inspector de Vîză
Prof. dr. Andrei PĂUN
Inspectoratul Școlar Județean Suceava
Prof. Viorel STUFAC
Inspectoratul Școlar Județean Neamț
Prof. Dr. Eugeniu Anghel
Ministrul Educației și Cercetării

4. On 25-27 February 2018 she participated in the Regional Forum of "LabelFrancEducation, Europe Central Oriental et Balte", which brought together 104 representatives of the francophone high schools holding the label LabelFrancEducation, but also a large number of cultural attachés French institutes from different European capitals and representatives of francophone business environments with activities on the territory of Romania. In the two presentations of the joint catalog of offers and resources, the partner high schools presented how they can take advantage of each partner's shared experience. An experience considered positive was that of the robotics team of the Petru Rares Suceava National College, through the completeness of the formative approaches.



5. Conclusion and development of activities in partnership with Stefan cel Mare University of Suceava, Faculty of Electrical Engineering and Computer Science, which includes the activities of the robotics club in Saturday School. Professor Coordinator from the University - Professor Prodan Remus.





Other team members

- Participation of student Cojocariu Vlad, member of CIRCUIT DEALERZ team at the seminar "Who are we? Where do we want to go? -in search for a European identity "Run by OTZENHAUSEN Academy, within the Erasmus Youth Youth Project 2017-3-DE04-KA105-016078. In the presentation session of the partner schools student Cojocariu Vlad made a description of the fact that he is part of the high school robotics and how this has helped him develop personally. It was an opportunity to present FIRST values.
- Collaboration with the college's debate club to run rounds of debates that focus on the relationship between robots and people and the values that should animate this relationship. As a tool for preparing rounds of debates, the CIRCUIT DEALERZ team offered the FIRST Handbook to the Debate Club, providing support in understanding the gracious professionalism. The debating team played in OPEN BUCOVINA region the motion "This Parliament would withdraw the citizenship of the Sophia robot", highlighting the geopolitical and ethical consequences on the condition that the woman has in the United Arab Emirates.
- Distribution of CIRCUIT DEALERZ promotional materials to secondary school students who visited college for professional orientation (which high school will follow when they complete secondary school) on Open door days
- Keeping in the entrance hall of the high school (where all visitors and pupils' parents enter through) a permanent exhibition with the banners that the 2017 robotics team had at the FIRST contest in Bucharest and St Louis USA. It is proof of the college's award to the previous team's performance and a way of promoting FIRST activities and the values they promote.



Other teams (Collaboration)

As mentioned at the Bucharest Regional, team AutoVortex helped us when our robot wasn't working and we didn't know what to do. We are really thankful to them, because without them we wouldn't have a decent place at the regional.



At the Cluj Regionals we got in touch with team Thobor and we formed a strong bond together, not only because we thought they were a good team but also because they were very kind and friendly. Because this was their first year at the competition, we decided we should help them out and give them advice the most notable one was giving them the notebook structure from last year, which won us Inspire Award. As thanks, they gave us the autonomous code that they used at the Iasi Regional.



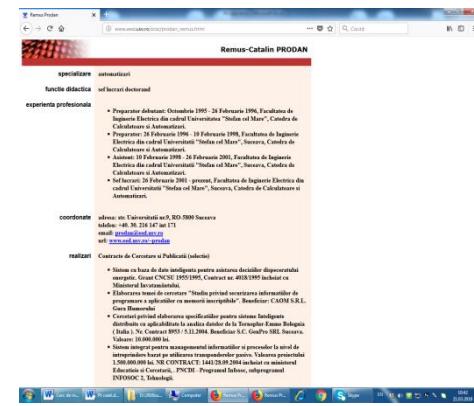
We are really happy that we found such hardworking, dedicated and kind teams, because it gives us examples of what a team should be like.



STEM local community

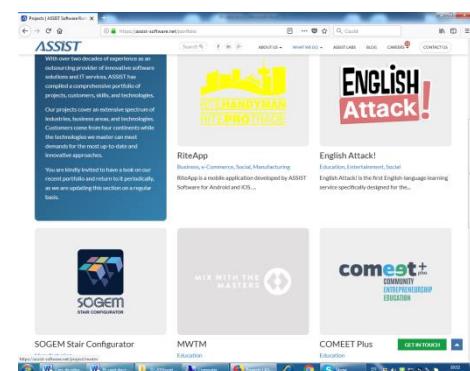
A) The link with the local STEM community was intense and long-lasting. It has been achieved progressively.

For example, the first chronological collaboration, which was initiated by partnership agreement, was with Stefan cel Mare University in Suceava, the Faculty of Electrical Engineering and Computer Science. The Rector of the University decided who is the responsible professor in the university to implement the partnership with the robotics club of the college, in the person of Professor Remus PRODAN. The PhD student, together with the master students group, supported on request various stages regarding the design of the robot and had access to university logistics (the workshop for parts).



The second collaboration was with SC ASSIST SOFTWARE SRL, who was also the sponsor of the robotics team in 2017, supporting the participation in the national phase of the FIRST competition. The company also has research contracts in large projects. Contact was made through a former college student, who was part of the first college group of college, studied computer science in the UK and now runs one of the company's research departments. The company's employees who have supported the robotics team are the following:

1. Alexandru BOCA, head of mobile development SC ASSIST SOFTWARE SRL
2. Silviu MACOVEI, Android developer, SC ASSIST SOFTWARE SRL
3. Stelian SENECICO, iOS software developer, SC ASSIST SOFTWARE SRL
4. Catalina MICHLIUC –marketing specialist, SC ASSIST SOFTWARE SRL



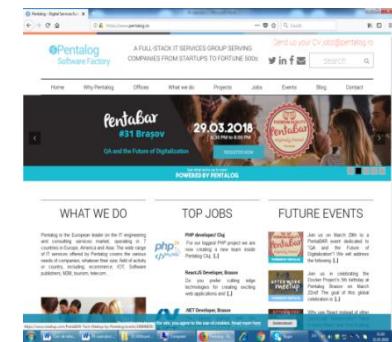
Alexandru BOCA is passionate about robotics on a personal level, participating in several gender competitions in Romania. The first 3 listed people provided support in intelligent endowment of the robot, and the fourth in implementing the marketing strategy.

Apart from the "consultancy" support, SC ASSIST SOFTWARE SRL sponsored the robotics team with money and printed the fly tickets, the exhibition stand, the vests and the team t-shirts. He also promised he will be a loyal partner of the team next year, provided the partnership ends much earlier than this year.



The third collaboration was with PENTALOG SOFTWARE FACTORY, which is a traditional partner of Suceava University. This collaboration was publicly opened by a meeting in the aula of the collage, attended by the robotics club, 90 students, 4 college teachers and the dean of the faculty Electrical Engineering and Computer Science of the University of Suceava. There are milestones for future collaboration, which will last for 2 years. The company has provided support in intelligent endowment of the robot. The company has pledged financial support for next year, provided early-warning of this.

All of the listed individuals belonging to the three collaborative structures worked voluntarily together with the robotics team. They even appreciated that they enjoyed working with the students, joined their enthusiasm, spending valuable time with them.



B) Increasing the depth of the STEM knowledge.

In order to do this, team members have entered the centers of excellence for specialty training in the fields of physics, informatics, integrated sciences and oratory. These centers of excellence are an independent educational structure in which students enroll and volunteer in courses in their chosen fields. As a result of this additional training, we have obtained:

- Awards at the County Physics Olympiad
- Awards at the local informatics Olympics
- Prizes at the PROSOFT @ NT Contest, SCIENCE category
- Prizes at the oratory contest



C. Using STEM knowledge in teamwork.

The contribution of each member to the team's activity, originally thought on the IMI principle "I WILL USE MY STRONG POINTS TO ANIHILATE THE WEAK ONES", was done within the subgroup it was part of. This corresponded to the third internal organization of the team:



3D Design: Tanase Albert-Cristian (3rd Prize at the 2018 Physics Olympiad), Hlosciuc Georgel-Florin, Adriano Jucan, Paduraru Cristian-Daniel (qualified at the National Physics Olympiad 2018, mentions in the interdisciplinary international competition PROSOFT @ NT, SCIENCES category, March 2018)

Assembly: Vlad Andrei Cojocariu, Martin George-Serban, Macovei Victor-Ioan (qualified at the national stage of the Physics Olympiad to be held April 3-7, 2018), Moldovan Andrei (mentions in the interdisciplinary international competition PROSOFT @ NT, SCIENCES category, March 2018)

Software: Matei Barba (mention at the County Mathematics Olympiad, 2nd Prize at the County Physics Olympiad and Participation in the County Computer Science Olympics 2018), Salagean Dragos-Grigore (participation in the county physics and computer science Olympiad, first prize in the oratory contest), Stanciu Catalin-Ioan (participation in the English County Olympics and qualified at the national computer science Olympiad)

PR: Morosan Teodor, Blindu Andrei Samuel (3rd prize at the County Physics Olympiad), Munteanu Tudor Emanuel. (Mention at the County Physical Olympiad 2018)

The first students of the subgroup are coordinators of the subgroups, with responsibilities in managing resources and mobilizing teammates in each step. They provided support to other students and received feedback from each member. Also, there was collaboration between subgroups, manifested in two ways:

1. Collaboration to make the robot look as a functional whole
2. Trust between groups. For example, the design and the software group help the assembling group in building the robot in its various phases. The student coordinator of the entire group, Salagean Dragos-Grigore, was particularly involved in coordinating mutual help among groups.



Internet publicity

Facebook page

The screenshot shows the Facebook page for "Circuit Dealerz - FTC". The page has 600 likes. It features a profile picture of a character with a red eye patch. The left sidebar includes links for Home, Posts, Reviews, Videos, Photos, About, Community, and Groups. The right sidebar displays metrics: 50% response rate, 2-day response time, 605 likes (+78 this week), 603 follows, and 3,423 post reach this week. It also shows a badge for "Circuit Dealerz".

As this is our second season of FIRST Tech Challenge, we decided after a meeting that we should keep last year's facebook page, and just adapt it to our new identity. All of last year's American and Inspire Award winning memories we're not lost, but still this put the pressure on us to be at least as good as last year.



This is our first post:

A post on the Facebook page. The post shows a photo of students working on a project. Below the photo, the caption reads: "220 people reached". To the right, a blue button says "Boost Unavailable". At the bottom, there are four interaction buttons: "Like", "Comment", "Share", and a "More" option. The post has been liked by "Stefan, Teodor Morosan and 8 others".



We knew right from the start that the Facebook page is going to be an very important aspect of our journey, because it is the main way to keep our fans posted and to reach to the people that are interested in our team. Constantly updating the page meant that the people following the page knew what was going on, so with a little help from the BRD FIRST Romania Facebook page we were able to share with the ones at home the Regionals and the upcoming events.

Also, we knew that dull description would not catch the eye of anyone, so with every occasion we tried to come up with a motivating description, full of energy and positivity.



Circuit Dealerz - FTC shared BRD FIRST Tech Challenge Romania's live video.

Published by Andrei Blîndu [?] · 18 December 2017 · 0

...

Circuit Dealerz sunt la Iași !



828 Views

BRD FIRST Tech Challenge Romania was live.
18 December 2017 · 0

Meet the teams | Workshop #Iasi Iris CNR Cyliis Thobor Circuit Dealerz - FTC
#RelicBot

Team #RO 044



Circuit Dealerz

But who is friends with us is friend with our community as well ! At the Workshop in Iasi we became friends with Thobor, and even took an amazing photo, that just had to go on the page.



Circuit Dealerz - FTC

...

Posted by Andrei Blîndu

19 December ·

Thobor and Circuit Dealerz 😎





When special events occur, you have to share the enjoyment with your community and let them know your grateful for everything they've done for you. Here at Circuit Dealerz we are true lovers of spring, so we had wish our community a happy spring!



Circuit Dealerz - FTC

Published by Andrei Blîndu [?] · 8 March at 09:11 ·

Primăvară frumoasă



8 martie frumos pentru domnisoarele si doamnele din viata noastră
cu drag, clubul Circuit Dealerz Petru Rânes

262 people reached

Boost Post

Like

Comment

Share





We also shared our sponsors facebook pages, and even shared the links of the times when we were mentioned in the newspaper and appeared on TV, but for these I invite you all to open your phones and check it out by yourselves, and maybe not forget to drop a like.

The page has over 600 likes, and our posts have an average of 400 people reached. But our most successful post ever is when we got the support of Miron Neculai, the mayor of Bosanci, with over 3,300 people reached, 50 likes on the post and 160 likes on the group we shared the photo

Circuit Dealerz - FTC
Published by Andrei Blîndu [?] · 19 March · 14:12

Domnul Primar al comunei Bosanci, Miron Neculai, este în sprijinul echipei !

Tag photo Add location Edit
3,340 people reached Boost Post
Like Comment Share ...
56 Chronological 6 shares 1 comment
Rodica Blîndu Multumim domnule Primar! Like · Reply · Message · 1d
Write a comment...

Circuit Dealerz - FTC

Published by Andrei Blîndu [?] · 19 March at 14:12

Domnul Primar al comunei Bosanci, Miron Neculai, este în sprijinul echipei !

Like

Comment

...

Costel Ieremie, Sîrghie Ieremie and 168 others

[View 5 more comments](#)



Liliana Sutac Felicitari si mult succes pe mai departe!

Love · Reply · 1d

2

Andrei Blîndu replied · 1 Reply



On other social media

We created a newsletter with the purpose of promoting the team and raising awareness of FIRST related competitions within the college. We sent the newsletter on Adservio (the college's online platform), where parents and students receive news, grades and many other school related things.

Newsletter

First Tech Challenge BRD

*Acet campionat presupune ca fiecare echipă participantă să construiască un robot care să îndeplinească funcții, respectând regulile ediției respective;

*Ediția de anul acesta se numește "First Relic Recovery";

*Competiția încurajează lucrul în echipă, având ca motto "Gracious Professionalism";

*FTC este cel mai mare Campionat de Robotică din România;

*Participă peste 1000 de elevi din 55 de orașe;

*23-25 martie 2018, Sala Polivalentă, București.

Circuit Dealerz

Clubul de Robotica

Bună ziua, membru al comunității Colegiului Național Petru Rareș!



În ediția precedentă, echipa Colegiului Național "Petru Rareș" Suceava a reușit performanța de a câștiga etapa națională a competiției și de a se califica la etapa internațională, în Statele Unite ale Americii.

SPONSORIZARI
În scopul participării la competiția de anul acesta ce se desfășoară de-a lungul a 3 zile și pentru a achiziționa noi piese pentru robotul pe nume Shorty, echipa este în căutare de sponsori. Cei care doresc să susțină echipa ne pot contacta prin adresa noastră de e-mail, pe pagina de facebook, sau telefonic.

Adresă de e-mail
circuit.dealerz@yahoo.com

Persoane de contact

Anca Greculeac 0723 630 706
Muntean Emanuel 0747 931 826
Blindu Andrei 0720 012 888

Pagina de facebook
[Circuit Dealerz - FTC](#)

Componentă echipei



In the newsletter we included information about FTC: RELIC RECOVERY(like the number of participants, the date of the competition and the venue), the members of the team, our Facebook page and ways for possible sponsors to contact us.

Team #R0 044



Circuit Dealerz

5. Game Strategy



1st Strategy

If our teammate is confident in the placement of the Relic we will focus ourselves solely on filling the Cryptobox until the end of the game .We are confident in filling a Cryptobox with a Cipher until the 2:00 minutes mark and so besides filling our own Cryptobox we can one column of our allied team's one ,as that would require us to go back and forth just two times .

$$154 \text{ p (Cryptobox filled with Cipher)} + 28 \text{ p (a full column)} + 55 \text{ p (Relic in the 3rd Zone standing up)} = 237 \text{ p}$$

2nd Strategy

If our teammate is prefers to place Gyphs instead of scoring the Relic we will grab the Relic at the beginning of the game . We will try to fill a Cryptobox without Cipher until the End Game. When End Game begins we will prepare for scoring the Relic .We will score two Relics standing up.

$$124 \text{ p (Cryptobox filled)} + 2 \times 55 \text{ p (two Relics standing up in the 3rd Zone)} = 234 \text{ p}$$

3rd Strategy

If our teammate is insecure in both tasks or experiences severe problems we will advise them to try to fill one row and then immediately go on the Balancing Stone

We will try filling one Cryptobox with Cipher first as if we leave the CryptoBox with only 2 columns and 2 rows we will lose a lot of potential points after this we will place one Relic and balance on the Stone.

$$154 \text{ p (Cryptobox filled with Cipher)} + 16 \text{ p (one Row filled)} + 55 \text{ p (Relic in the 3rd Zone standing up, depends on Drivers)} + 40 \text{ p (both robots being balanced)} = 259 \text{ p (or 204 p if we do not score the Relic)}$$

In all this strategies we counted only the points we are sure of scoring ,depending on the allied team and our synergy we can score even more.

Additionally, to this points in Tele OP we can add the 85 points in Autonomous Period.



Tips & Tricks we came up at the Regionals

While playing at the Regionals we came up with several tricks to boost our points as our Shorty was not at its peak capacity.

- Standing on the Balancing Stone(20 points) is worth almost as many points as a Column(28 points) and more than one Row(16 points), if one Cryptobox is filled it is not worth to try to fill the other one as well because it takes more time.
- Two Relics standing up in the Zone I (50 p) is worth almost as much as 2 Columns(56p) , we did not have a slider for Relics at the Cluj Regionals but we had however out Claw used for Glyph placement and so we used that to score bonus points.
- Columns are easier to fill than Rows and worth more points , for a Column you need to go 2 times back and forth as for a Row you need to go 3 times back and forth no matter the system used for scoring Glyphs
- If you can't go back on the Balancing Stone and you can't complete one Row in Tele OP nor park during Autonomous Period , it's best to just Score the Jewel in the Autonomous (30 p) and stay there for the rest of the game. Also you can place the Glyph close to the allied team so that they have one less road to go, you would contribute with about 50 p.

Team #R0 044



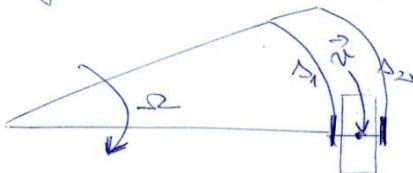
Circuit Dealerz

6. ROBOT DESIGN



Physics when considering the robot's design

3.2. 10. La un viraj rotile motoare de rază $r = 20\text{ cm}$ ale unui tractor curgând se rotesc în același sens cu $\omega_1 = 6 \frac{\text{rad}}{\text{s}}$ (stânga) și $\omega_2 = 3 \frac{\text{rad}}{\text{s}}$ (dreapta). Lățimea tractostrului este $l = 1,6\text{ m}$. Afloți rază circului de viteză pe care se mișcă tractorul și viteză supraletală a acestor mișcări de viraj.



$$\begin{aligned} \Delta_1 &= \omega_1 r \Delta t = \omega \left(R - \frac{l}{2} \right) \Delta t \\ \Delta_2 &= \omega_2 r \Delta t = \omega \left(R + \frac{l}{2} \right) \Delta t \\ (\omega_1 + \omega_2) r \Delta t &= \omega \cdot l \\ (\omega_2 - \omega_1) r &= \omega \cdot l \\ \Rightarrow \text{raport } R &= \text{diam.} ; \quad \frac{(\omega_1 + \omega_2)R}{(\omega_2 - \omega_1)R} = \frac{2R}{l} \Rightarrow \boxed{R = \frac{(\omega_1 + \omega_2)l}{2(\omega_2 - \omega_1)}} \\ R &= 5,6\text{ m} \\ \boxed{\omega = \frac{(\omega_2 - \omega_1)r}{l}} , \quad \omega &= 0,25 \frac{\text{rad}}{\text{s}} \end{aligned}$$

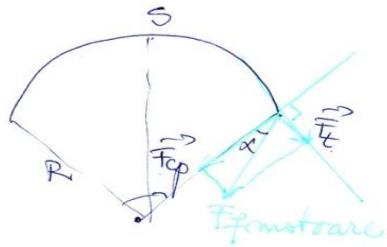
In order to solve the various problems regarding the robot's design and to make a decision when more options were at hand, the problem was often solved with a physics problem.

For example, when it was necessary to decide which type of wheels to use for the movement of the robot, the mentor of the team, a physics teacher, wanted to make sure that the wheel mechanics of the MECANUM type students can relate the angular velocity of the turn motion to the angular rotational speeds of the inner and outer wheels (which is determined by the commanded value of the electric current passing through the motors that feed the wheels).

Something that was noticed was the superiority of Mecanum wheels compared to the other models (many degrees of freedom), but also the difficulty of using them due to the possibility of locking during handling.



(12/18/9) $\mu_t = \text{const.}$
 $S = 50\text{m}$
 $R_i = 10\text{m}$
 $\omega_{\max} = ?$
 $\mu = 0.128$



$$S = R_i \cdot 2\lambda \Rightarrow 2\lambda = \frac{S}{R} \Rightarrow \lambda = \frac{S}{2R}$$

$$f_f = \mu m g \sin \alpha = m a_t \Rightarrow a_t = \mu g \sin \alpha$$

$$(F_N)_{ap} = \mu m g \cos \alpha = \frac{m v^2}{R}$$

$$N_m^2 = 2a_t S \Rightarrow a_t = \frac{N_m^2}{2S} = \text{const.}$$

N - cruce progresiv $\Rightarrow F_{ap}$ - cruce progresiv

} pericol
de derapare \Rightarrow final.

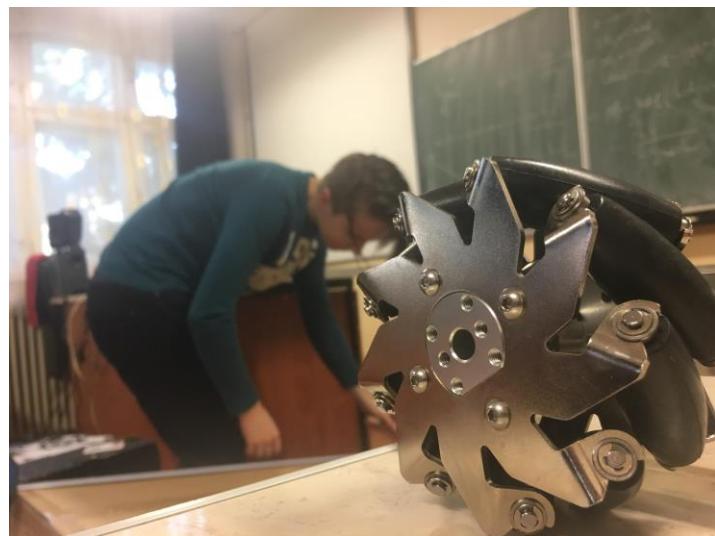
La finalul traiectoriei automobilul este gata - g. t.
A - derapare $\Rightarrow (F_f)_{motoreare} = \mu N$

$$\Rightarrow \mu N = \mu m g = \sqrt{F_f^2 + F_{ap}^2} = m \sqrt{\frac{N_m^4}{4S^2} + \frac{a_t^2}{R^2}}$$

$$\mu m g = \mu N \sqrt{\frac{1}{4S^2} + \frac{1}{R^2}} \Rightarrow \boxed{a_t^2 = \frac{\mu^2 g^2}{\frac{1}{4S^2} + \frac{1}{R^2}}}$$

To test the risk of the robot slipping while taking the curve (during the autonomous period, when the robot passes from the rectilinear trajectory to the curvilinear trajectory to build cubes in the cabinet), the maximum speed in the curve was related to the skid limit if the radius of curvature was known and the length of the brake and acceleration arcs respectively. In this context, the question of the experimental value of the friction coefficient between the wheels and the surface on which they are moving.

Three experimental measurement methods were proposed in the physics laboratory of the friction coefficient. The average value obtained by the three methods was $\mu = 0.101$, which is lower than the value of the problem. There is no danger of the robot slipping while traveling.

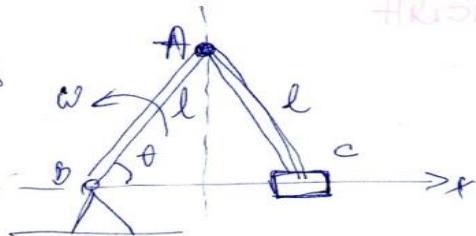


12.158). $l = 1 \text{ m}$

$\omega = 5 \text{ rad/s}$

$\omega_{\max} = ?$

$a_{\max} = ?$

HRISTEV
clata 2/2

$$x = 2l \cos \theta \Rightarrow \frac{dx}{dt} = -2l \sin \theta \cdot \frac{d\theta}{dt} = -2l \omega \sin \theta$$

$\omega_0 = \frac{dt}{dt}$

$\dot{\theta} = -2l \omega \sin \theta$

$\dot{\theta} = \max \Leftrightarrow \sin \theta = \max = 1$

$$a \left(\frac{d^2 x}{dt^2} \right) = -2\omega^2 l \cos \theta$$

$a = \omega_{\max} (\Rightarrow \cos \theta = \max = 1)$

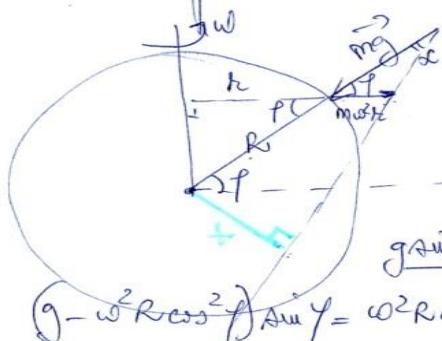
$|\omega_{\max}| = 2\omega l$

$|a_{\max}| = 2\omega^2 l$

(12.163)

$x_{\max} = ?$

$P_f = 6400 \text{ kN}$



$\cos \varphi = \frac{r}{R} \Rightarrow r = R \cos \varphi$

$\frac{\sin \alpha}{\mu \omega^2 \cdot R \cos \varphi} = \frac{\sin(\bar{\alpha} - \alpha - \varphi)}{\mu g}$

$\frac{\sin \alpha}{\omega^2 R \cos \varphi} = \frac{\sin(\alpha + \varphi)}{g}$

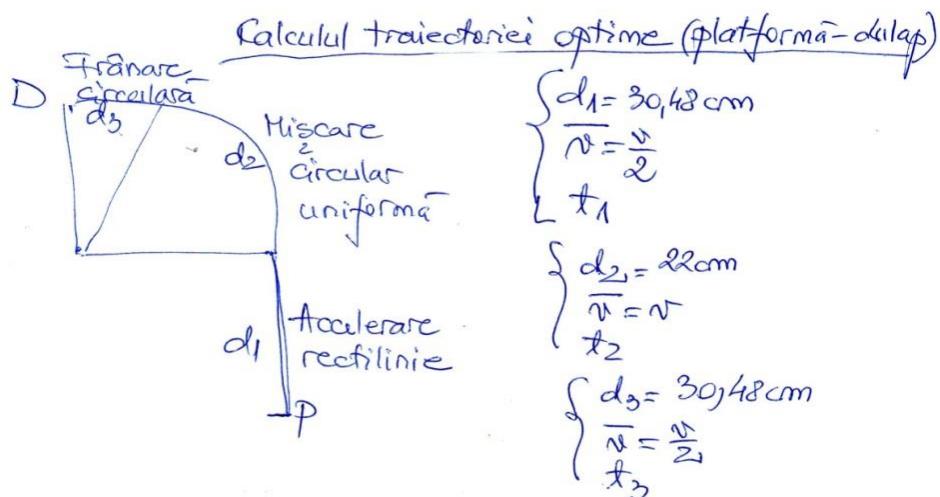
$\frac{\sin \alpha}{\omega^2 R \cos \varphi} = \frac{\sin \alpha \cos \varphi + \cos \alpha \sin \varphi}{g}$

$g \sin \alpha = \omega^2 R \frac{\sin \alpha \cos^2 \varphi + \omega^2 R \cos \alpha \sin \varphi \cos \varphi}{g}$

$(g - \omega^2 R \cos^2 \varphi) \sin \alpha = \omega^2 R \cos \alpha \sin \varphi \cos \varphi \Rightarrow \tan \varphi = \frac{\omega^2 R \sin \alpha}{g(g - \omega^2 R \cos^2 \varphi)} \rightarrow 0$

When it was necessary to decide the type of arm to be used for sliding the boxes, the problem was solved. The maximum speed, maximum acceleration of the head of the arm, the length of the active part of the arm and the angular velocity of the "forearm" was related. The method described in the problem was abandoned, as the yield of collecting the boxes and moving them on the variety of collection described in the problem had little yield.

Also, an analogy was made between the rotation of the arm and the rotation of the ground around its axis in order to estimate the centrifugal displacement of the arm load in its rotational design. And this variant was abandoned due to its ineffectiveness.



$$d = \frac{v}{2} t_1 + v t_2 + \frac{v}{2} t_3 = v t_1 + v t_2 = v(t_1 + t_2)$$

$$t = t_1 + t_2 + t_3 = 2t_1 + t_2$$

$$\left. \begin{array}{l} \frac{v}{2} = \frac{d_1}{t_1} \\ \frac{v}{2} = \frac{d_2}{t_2} \\ v = \frac{d_2}{t_2} \end{array} \right\} \text{raport } \alpha = \frac{d_2}{t_2} - \frac{t_1}{d_1} = \frac{d_2}{d_1} \cdot \frac{t_1}{t_2} \Rightarrow$$

$$\frac{t_1}{t_2} = \frac{\alpha d_1}{d_2} = \frac{\alpha \cdot 30,48 \text{ cm}}{65,22 \text{ cm}} = 0,93 \Rightarrow$$

$$t_1 = 0,93 t_2$$

$$\text{Deci: } t = 2t_1 + \frac{t_1}{0,93} = t_1 \left[2 \cdot 0,93 + 1 \right] \Rightarrow t_1 = \frac{t \cdot 0,93}{2,86}$$

$$t_1 = \frac{35 \cdot 0,93}{2,86} \Rightarrow \left\{ \begin{array}{l} t_1 = 0,970 \\ t_2 = 1,045 \\ t_3 = 0,970 \end{array} \right.$$

During the period of autonomy, the robot's trajectory was also decided. This could have been parabolic or could have been linearly connected to a fourth of a circle. It was concluded that the rectilinear trajectory connected to the circular one was more stable. After this decision, acceleration, uniform displacement and braking forces had to be calculated on the corresponding trajectory portions. Relative equal travel times were obtained for acceleration, uniform displacement and braking.



Verificarea posibilității de derapare prin akineare

Portiunea 1: HRLIV

$$v^2 = \alpha d_1$$

$$N = \alpha t_1$$

$$d_1 = \frac{\alpha t_1^2}{2} \Rightarrow \alpha = \frac{2d_1}{t_1^2} = \frac{2 \cdot 30,48 \text{ cm}}{0,97^2 \text{ s}^2} \Rightarrow \alpha_1 = 64,78 \frac{\text{cm}}{\text{s}^2}$$

$$N = 64,78 \frac{\text{cm}}{\text{s}^2} \cdot 0,97 \text{ s} = 62,84 \frac{\text{cm}}{\text{s}} = 0,62 \frac{\text{m}}{\text{s}}$$

Portiunea d₂: MCLIV

$$\boxed{\mu^2 g^2 = \alpha_{cp}^2 + \alpha_{tg}^2}$$

$$\alpha_{cp} = \frac{v^2}{R_i} = \frac{\alpha^2}{4R_i} = \frac{0,38}{4 \cdot 0,65} = 0,14 \frac{\text{m}}{\text{s}^2}$$

$$0 = N^2 - 2\alpha_{tg} \cdot d_2 \Rightarrow \alpha_{tg} = \frac{N^2}{2d_2} = \frac{0,62^2}{2 \cdot 0,3} = 0,64 \frac{\text{m}}{\text{s}^2}$$

$$\alpha_n = \frac{v^2}{R_i} = \frac{(0,62)^2}{60,96} = 0,06 \frac{\text{m}}{\text{s}^2}$$

Revenire: $\mu^2 g^2 = (0,64^2 + 0,006) \frac{\text{m}^2}{\text{s}^4} \leq 0,64^2 \Rightarrow$
 $\Rightarrow \mu \approx 0,081$

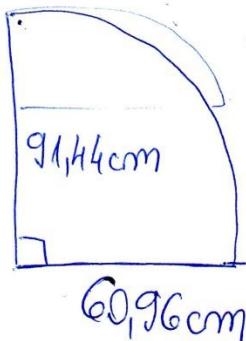
Comparatie cu μ măsurat: $\mu_{\text{măsurat}} = 0,101$

Concluzie: niciun pericol de derapări.

After establishing the trajectory, it was necessary to check whether there was a danger of skidding on the determined trajectory (rectilinear, circular) portions. By calculation, a friction coefficient value of 0.081 was obtained at the skid limit, less than that measured experimentally. So there is no danger of skidding on any trajectory.

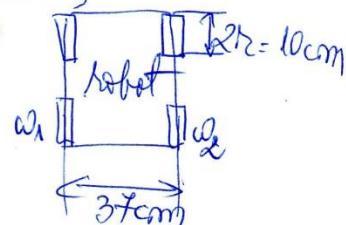
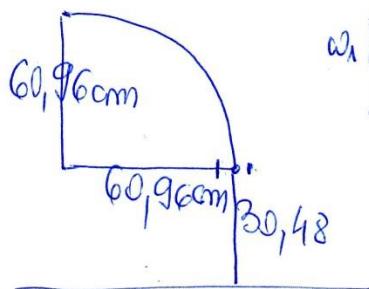


$$l_{in} = 2,54 \text{ cm}$$



Calculul relației dintre curentii care alimentează roțile.

(=)



$$R = \frac{(\omega_1 + \omega_2) l}{\alpha(\omega_2 - \omega_1)} \Rightarrow \frac{\omega_1 + \omega_2}{\omega_2 - \omega_1} = \frac{2R}{l} = \frac{2 \cdot 60,96 \text{ cm}}{37 \text{ cm}} = 3,295 \approx \alpha$$

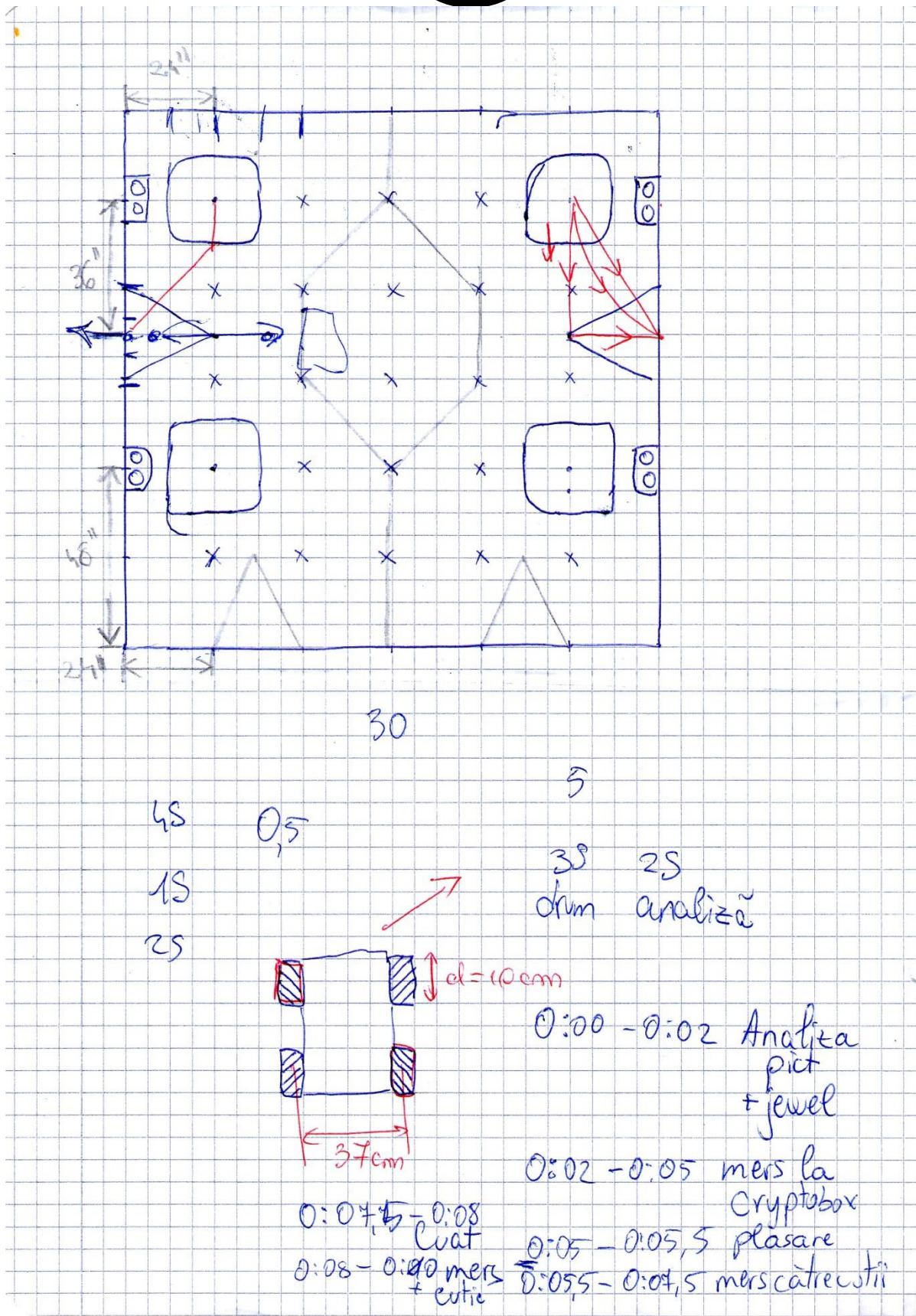
$$\frac{\omega_1 + \omega_2}{\omega_2 - \omega_1} = \alpha \Rightarrow \omega_1 + \omega_2 = \alpha \omega_2 - \alpha \omega_1 \Rightarrow \omega_1(1 + \alpha) = \omega_2(\alpha - 1) \Rightarrow$$

$$\frac{\omega_1}{\omega_2} = \frac{\alpha - 1}{\alpha + 1} = \frac{3,295}{4,295} = 0,5343 \Rightarrow \frac{\omega_1}{\omega_2} = 0,53 \Rightarrow \boxed{N_1 = 0,53 N_2}$$

$\omega_1 \propto N_1, \omega_2 \propto N_2$

The relationship between the currents feeding the Mecanum wheels (left and right) was calculated and the ratio of 0.53 was found. This is the optimal ratio of the currents that reach the wheels when the robot makes the curve

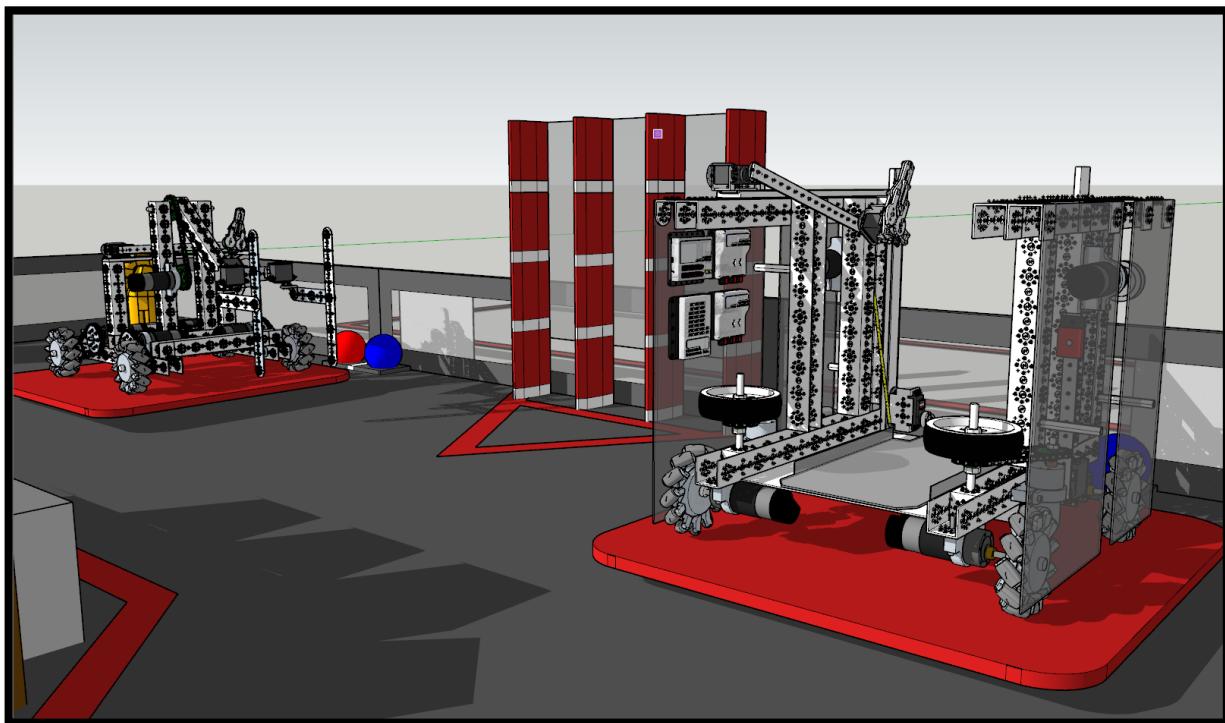
On the next page is the drawing that was initially made to determine the robot's trajectory during the stand-alone period.





The 3D Representations of Shorty and Compact Buffalo, The Robots.

Throughout the preparation for the National Competition in Bucharest, our robot had several changes, from the ones made for its functions to the ones regarding its appearance. As team, in order to constantly improve the model, we have tried to do our best when coming up with new ideas and suggestions. With a lot of hard work, the robot got the shape it has.



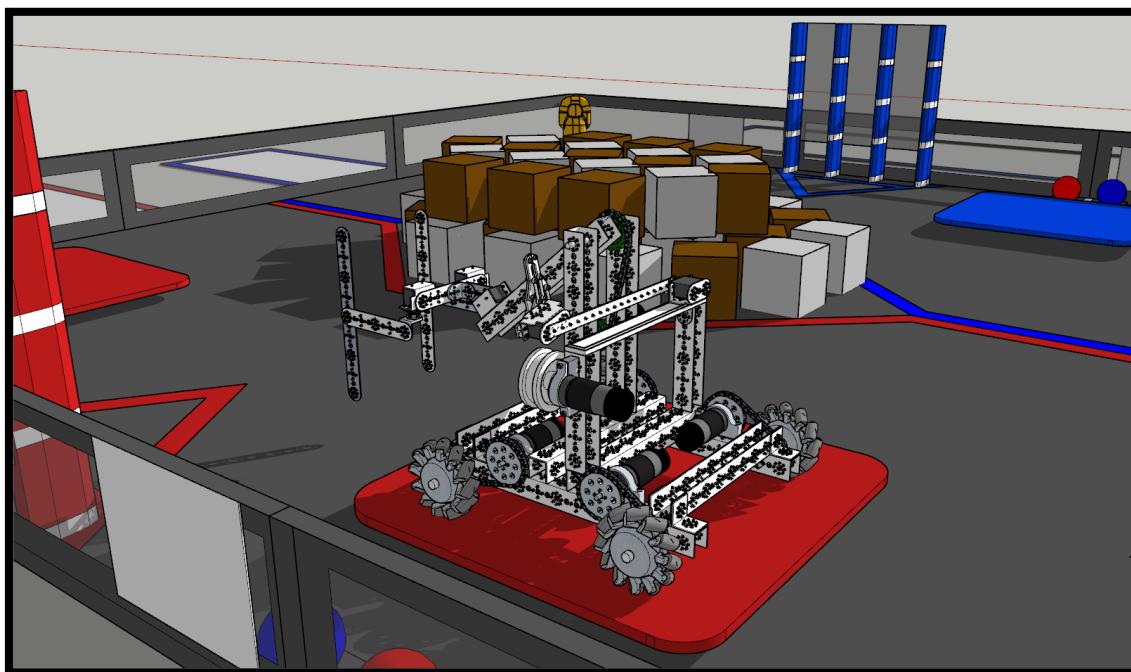
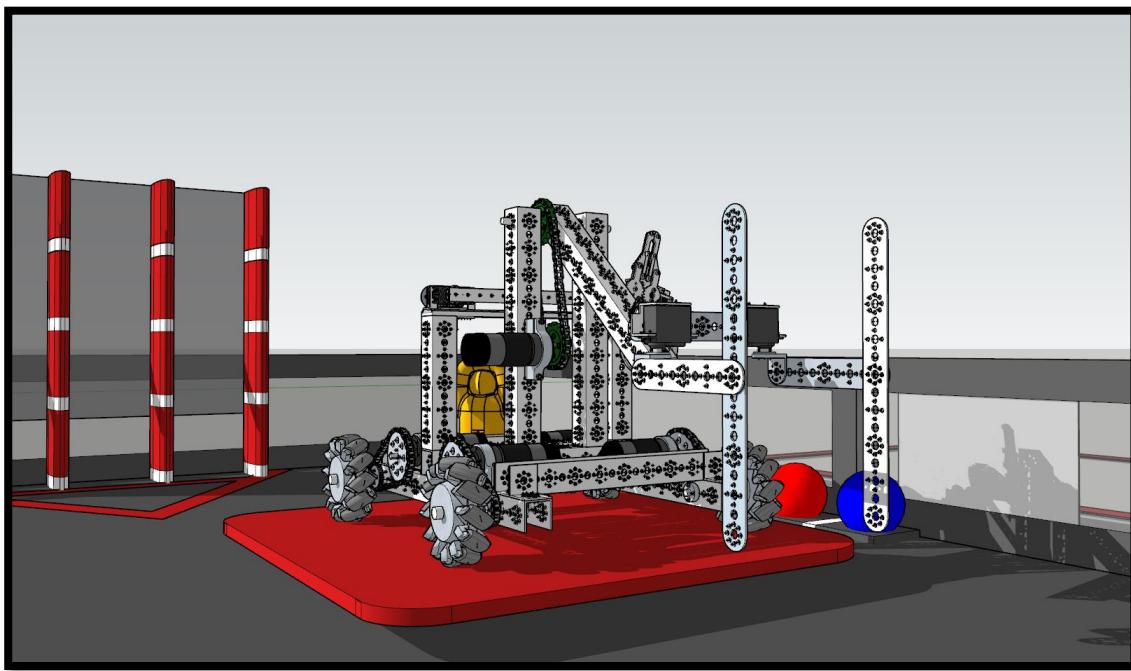
The Regional Competitions that we attended at Cluj and Bucharest were a great opportunity for the team to understand better the mistakes in the model, what should be done in order to improve them, and what to do in order to make sure that the inspection of the robot would occur without embracing any problems.

WE have two main models: Compact Buffalo, the one which was first used at the Cluj Competition, and Shorty, the one we prepared for the National Competition. Even though the two robots are different in shape, they both serve the same functions, with the same principles at their foundation.



Compact Buffalo

From the first meetings our team has established that one of our main priorities would be to make our robot as efficient as possible in the Tele Op period. For that, a fast arranging of the boxes was mandatory. This model is based on the idea of making as few moves as possible when carrying the cubes to the Cryptoboxes.





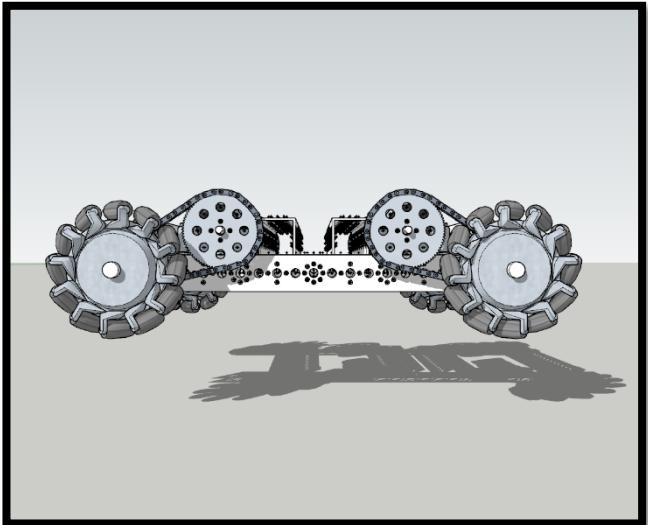
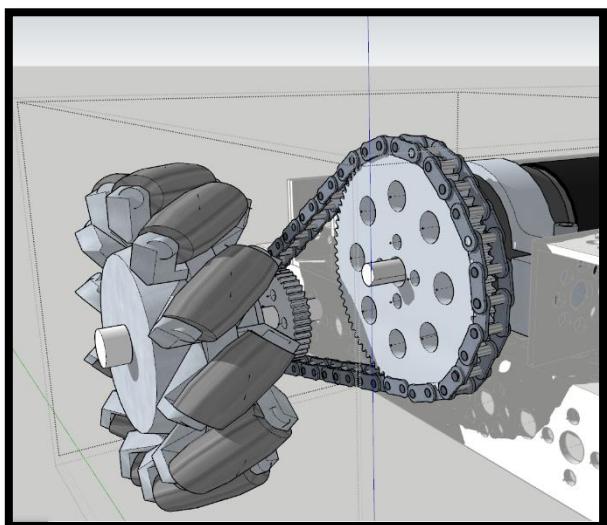
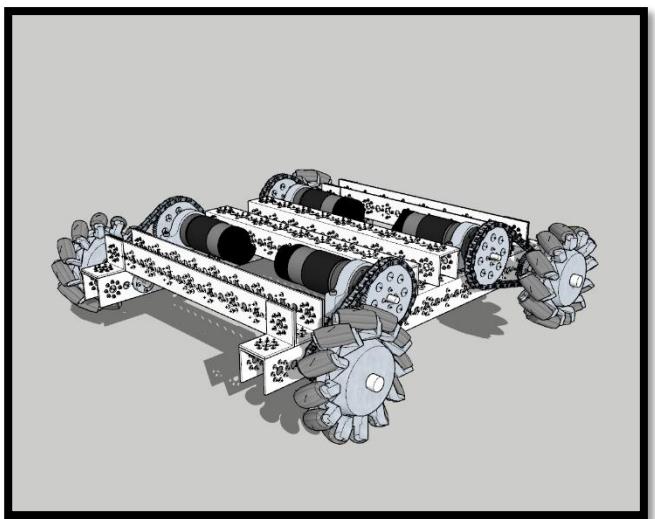
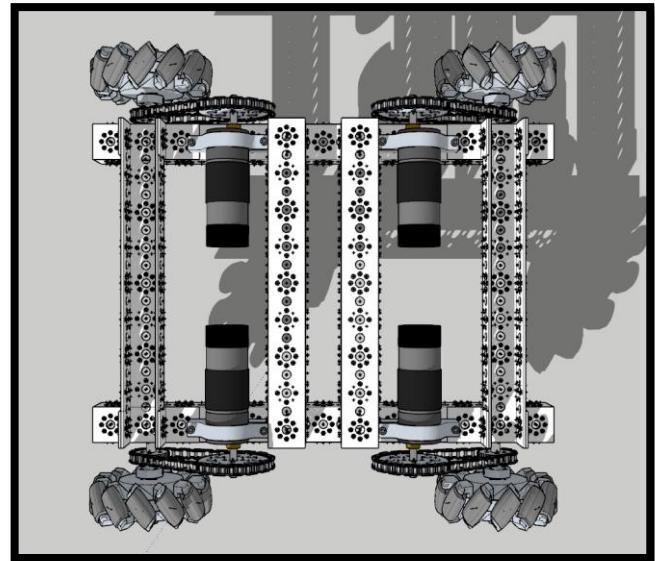
The Base:

Components:

- 2x Tetrix 416 mm C-Channels used for the sides;
- 4x Tetrix 288 mm C-Channels used as a foundation for the upcoming functions and internal resistance;
- 2x Tetrix 32 mm C-Channels;
- 8x L Brackets;
- 4x Andy Mark Motors;
- 4x Tetrix Motor Mount;
- 4x Chains;
- 4x Tetrix 80-tooth Gear;
- 4x Tetrix 40-tooth Gear;
- 4x Mecanum Wheels;

The Base has two main parts, the body which consists of the Tetrix C-Channels attached together with the L and C shaped brackets, and the engine.

The engines are what causes the robot's movement. Each Andy Mark Motor has one Tetrix 80-tooth Gear which is connected with a 40-tooth gear with a chain. The smaller gear, determines the Mecanum Wheel to start rotating.





The Hand:

This part is used for gathering and arranging the cubes in the Cryptoboxes. It has two components: a lever used to assure the rotation and the hand which carries the boxes.

Components:

The leaver:

- 3x Tetrix 288 mm C-Channels, two of which used for placing the leaver at a level high enough for it not to hit any other part of the robot and one for the support of the hand;
- 1x Andy Mark Motor;
- 1x Tetrix Motor Mount;
- 1x Servo Motor;
- 1x Servo Motor Holder;
- 2x Printed Toothed Wheels;
- 1x Chain;

The Andy Mark Motors along with the two printed gears connected with a chain attached to the third Tetrix C-

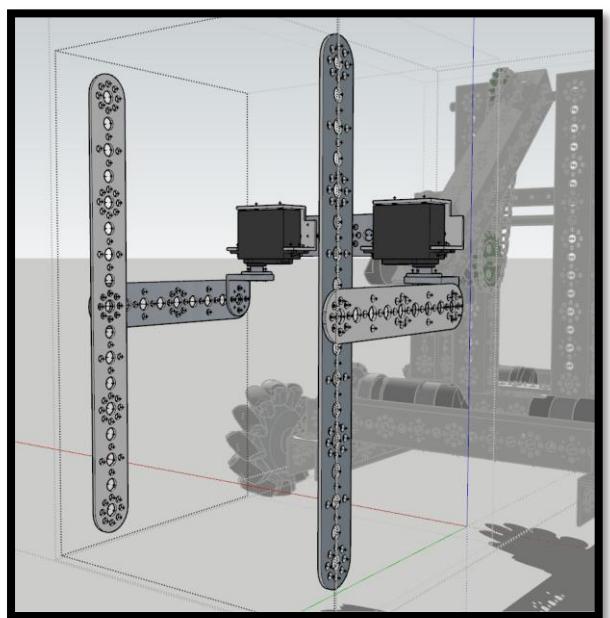
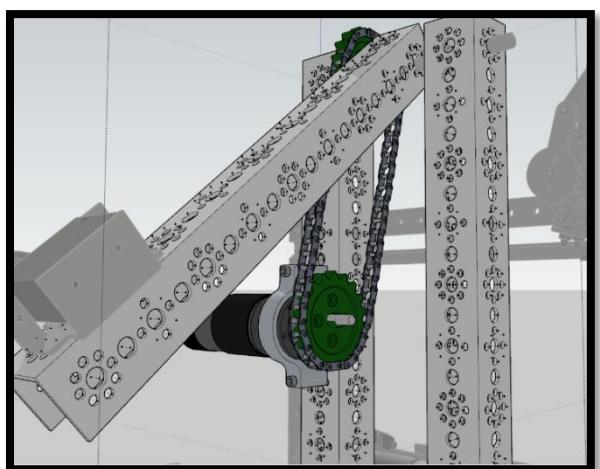
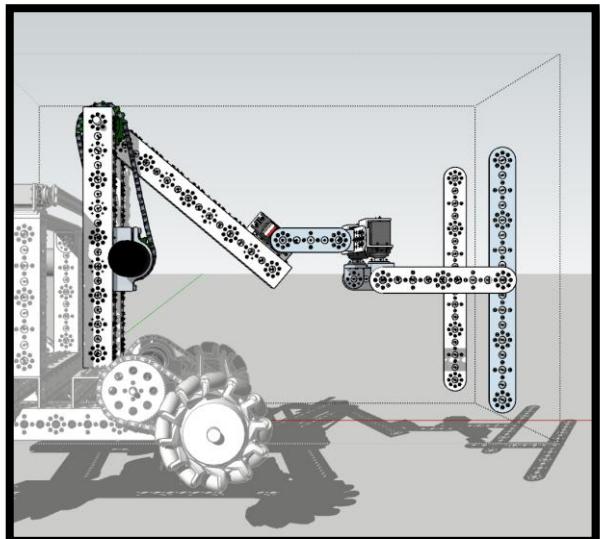
Channel form the mechanism that revolves the hand;

The Servo Motor is connected to the hand. Its purpose is to orientate horizontally hand in order to make it easier for us to grab to cubes.

The Hand:

- 2x Tetrix 288mm Flat Profile;
- 3x Tetrix 160 mm Flat Profile;
- 2x Servo Motors;
- 2x Servo Motor Holders;
- 2x L Brackets;

The 2x Tetrix 288mm Flat Profiles assure the transportation of the cubes through their horizontal movement which makes it easier to grab the boxes.



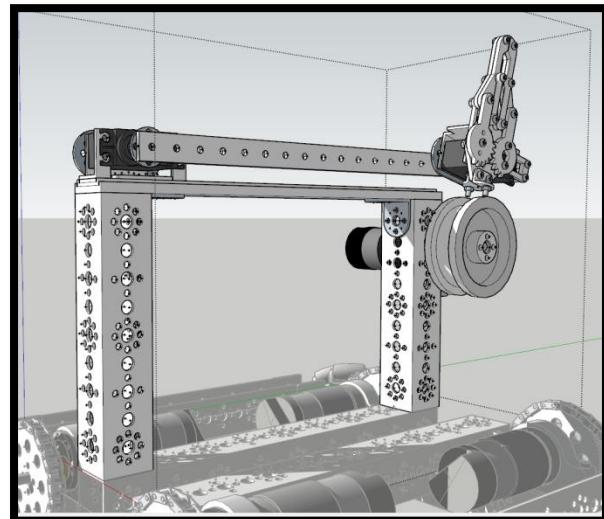


The Clipper:

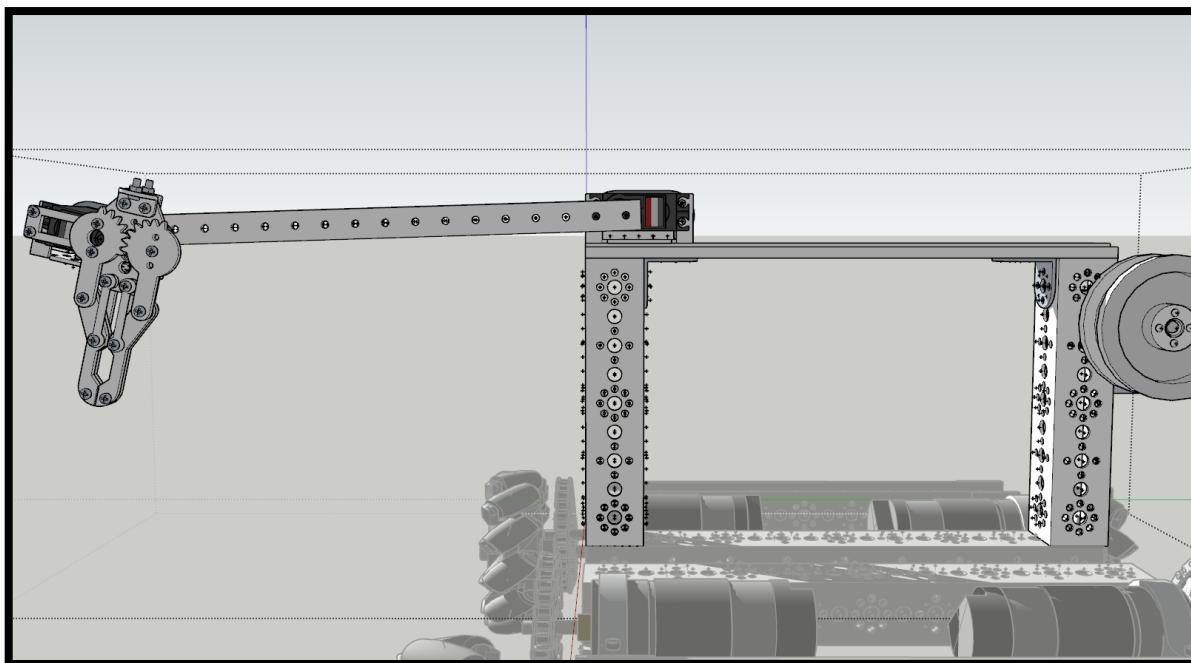
The Relic represents a crucial part in the end of the game. If placed in the correct position on the right spot, this object can be a real game changer. For this reason, we have known from the start that this was an important aspect to be taken into consideration.

Components:

- 1x Slider;
- 2x Tetrix 160 mm C-Channels for the slider to be placed high enough for it to go over the fence;
- 1x Andy Mark Motor;
- 1x Printed Wheel;
- 2x Servo Motor;
- 2x Servo Motor Holder;
- Rope for the slider to move;
- 1x Clipper;

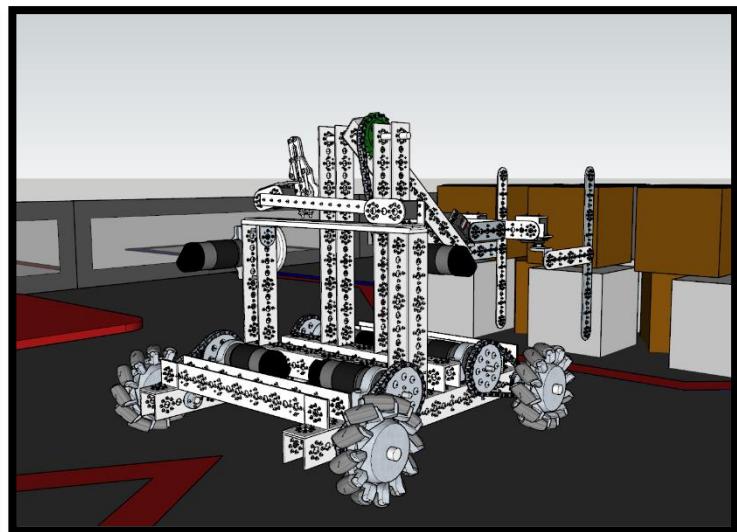
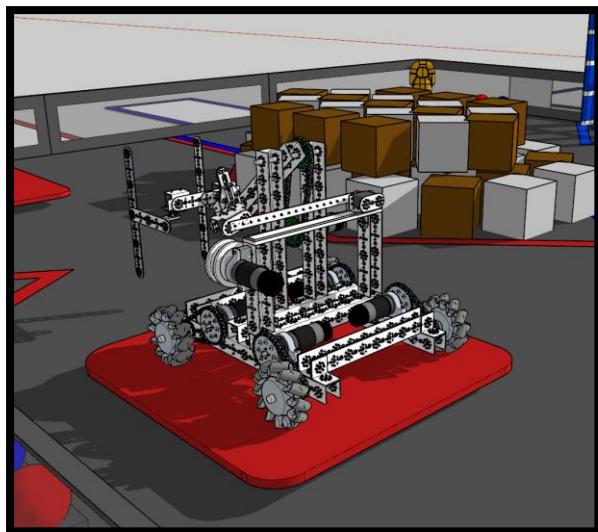


One of the Servo Motor is used for rotating the clipper 180 degrees in order to rise the relic and the second one is used for the clipper, which determines its two parts to revolve, creating space to take the relic. With the help of the slider, whose expansion is caused by the Andy Mark Motor, the relic can travel outside the arena.

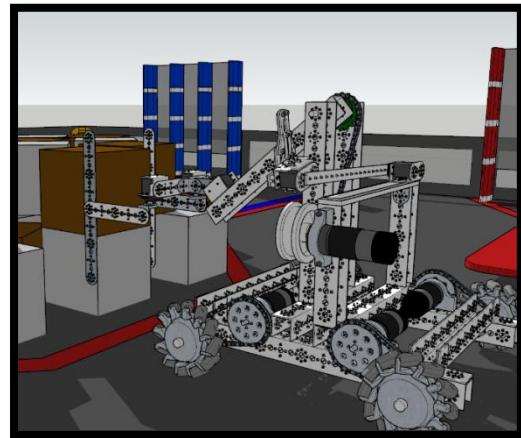
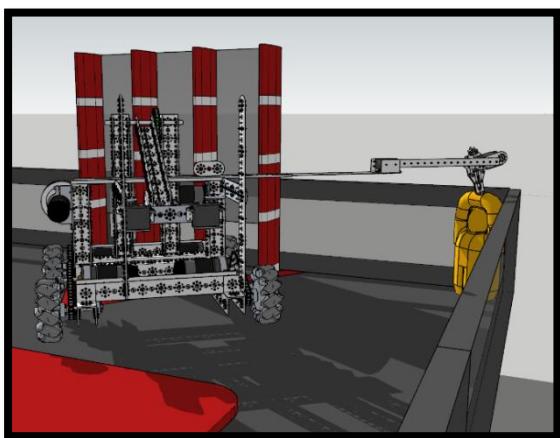
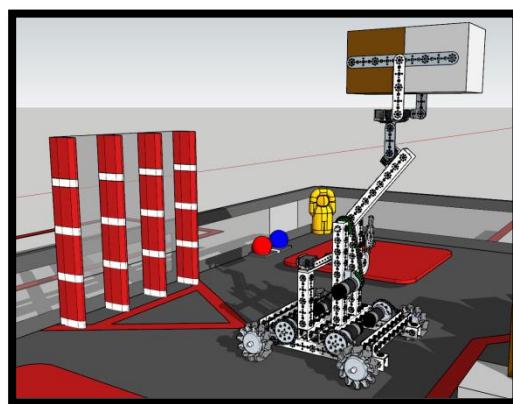
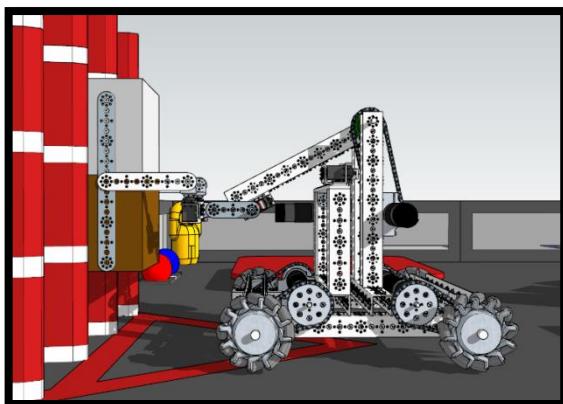




Compact Buffalo in the Cluj Arena:



At the Cluj Competition, Shorty had only 3 functions, the one for movement, the one for arranging the boxes in the Cryptobox and the one for the relic. Unfortunately, the robot had no autonomous part, but we tried our best to gain as many points as possible. It was a great chance for us to discover its strong and weak points.



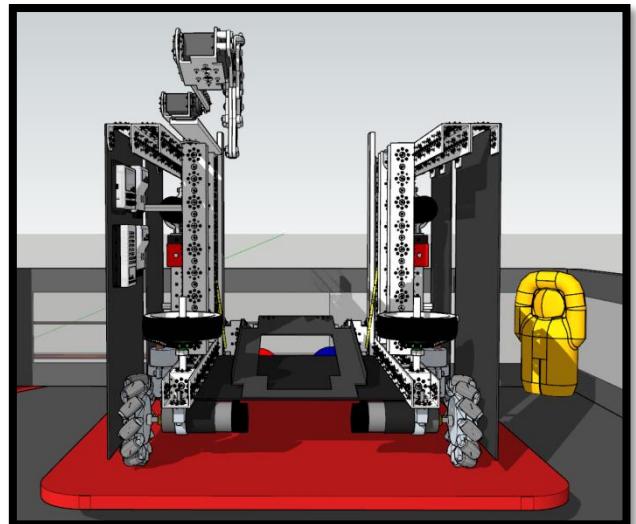
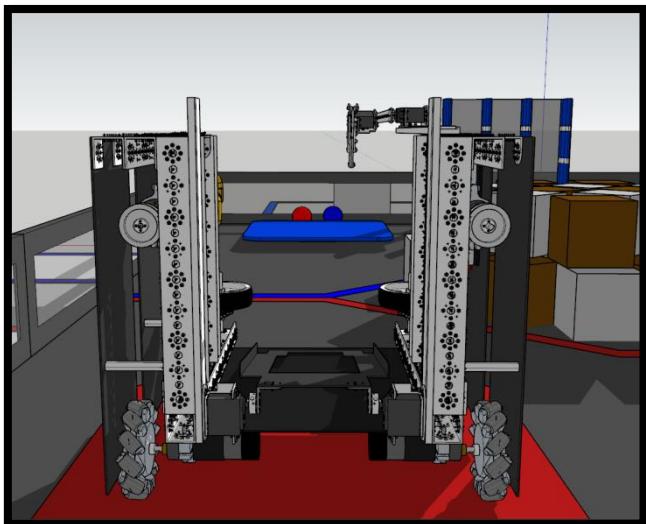
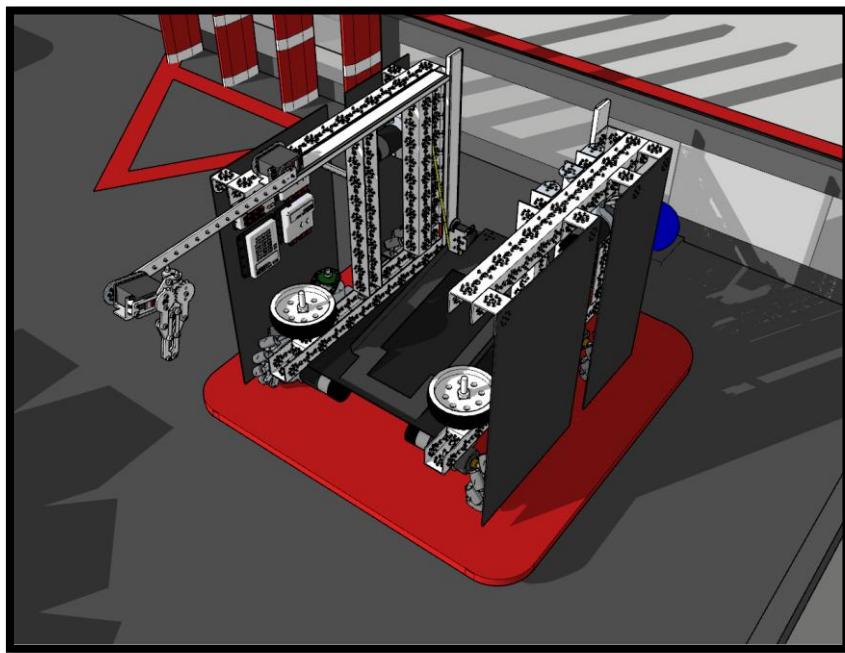


Shorty

This idea of this robot was born after the Cluj Regionals. Compact Buffalo was not complete, it was lacking in the autonomous part, plus the solution found for taking the cubes had to be improved.

Based on the same principle of transporting the boxes as fast as possible, Shorty comes with a lift and a vacuum-type mechanism to get the boxes. The other functions used in the autonomous part were added, as well as side wall to protect the interior.

In addition to this, our team wanted to customise the robot, giving it its own personality and making it in theme with our logo.





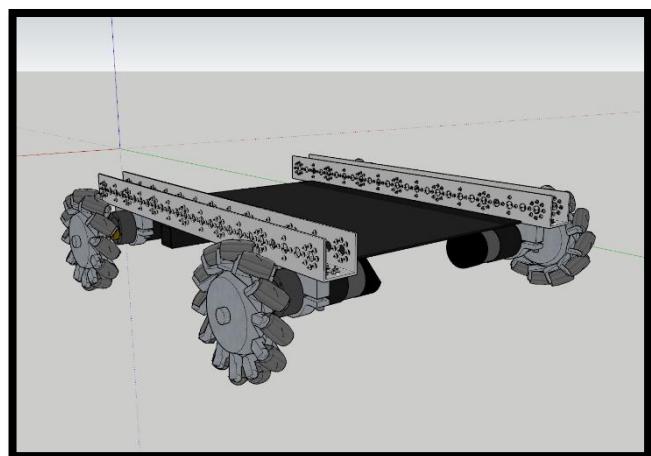
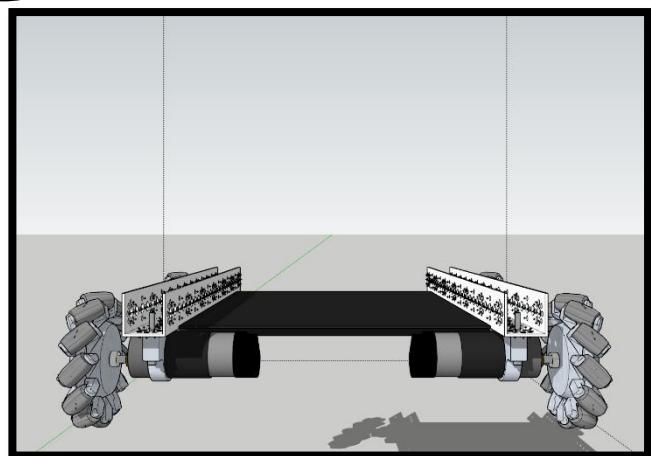
The Base:

Components:

- 2x Tetrix 416 mm C-Channels used for the sides;
- 4x Andy Mark Motors;
- 4x Tetrix Motor Mount;
- 4x Mecanum Wheels;
- 2x Alluminum Bars used to connect the Tetrix Channels;
- One 300x240mm Plexiglas Board

This relatively simple base of the robot has allowed us much more room for the other functions, as well as space for the upcoming lift for the boxes.

All the 4 Andy Mark Motors are directly attached to the 4 Mecanum Wheels;

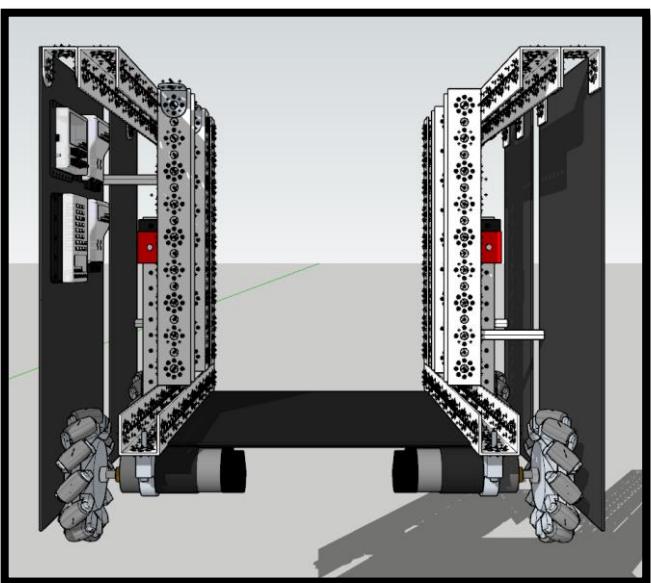


The Walls:

Components:

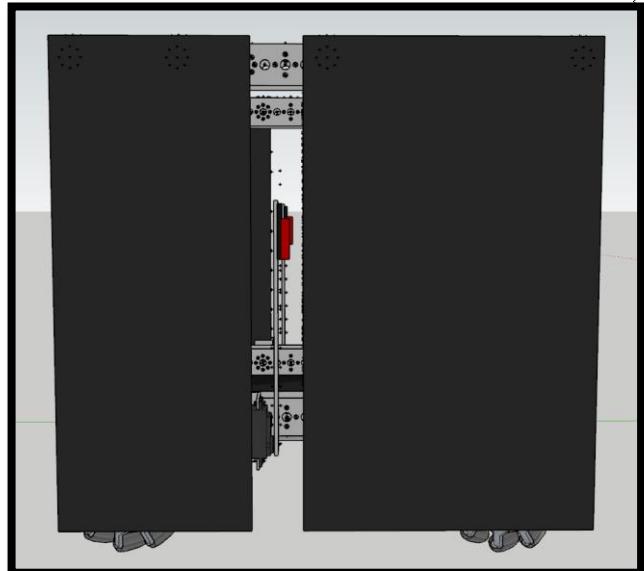
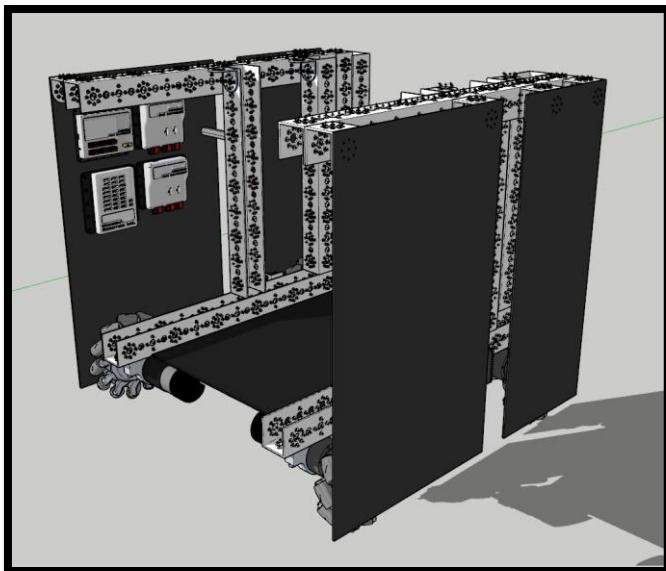
- 2x Tetrix 416 mm C-Channels used for the upper sides;
- 3x Tetrix 288 mm C-Channels orientated vertically which represent the support for the functions of the robot;
- 2x Plexiglas Boards cut in half;
- 8x L Brackets;
- 6x Tetrix 96 mm Flat Profiles;

The special cut in the middle allows 2 bars situated on the sides to rotate. Later on, these two will be used in the autonomous part for the two coloured balls.





These Walls were a great spot for us to place the hubs and the wires. The protection of the interior as well as the one for the wheels represented another



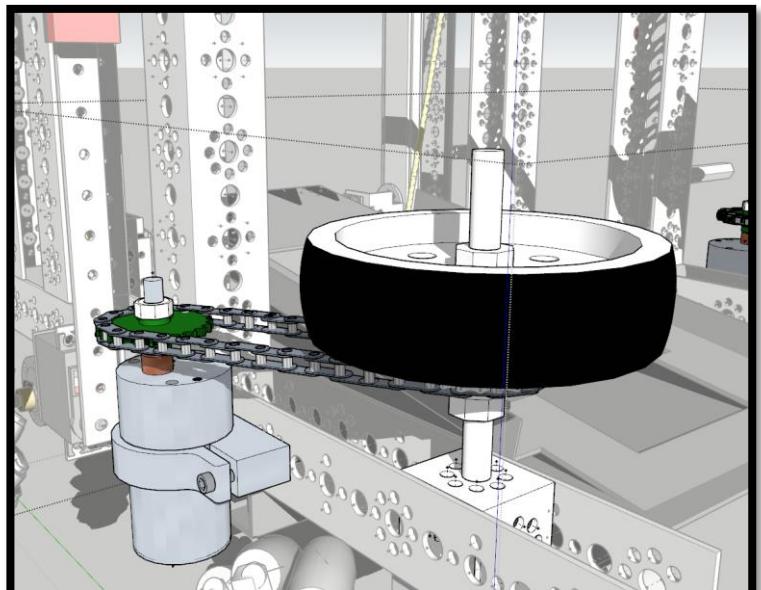
priority for the inspection.

Vacuum-type Mechanism:

Components:

- 2x Tetrix Motors;
- 2x Tetrix Motor Holders;
- 4x Tooth Printed Gears;
- 2x Tetrix 4" Wheels without Tires;
- 2x Tetrix 8 mm Screws;

To the Tetrix wheels were attached special materials for a better grip of the boxes.



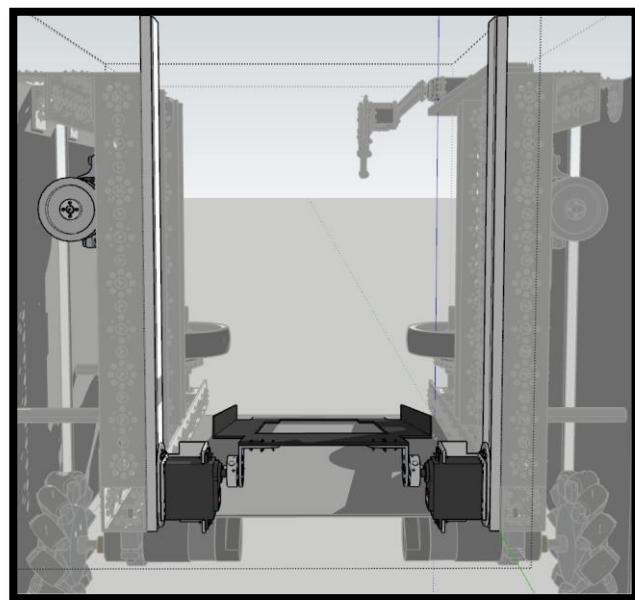
Depending on the rotation given by the Tetrix Mototrs, the robot can take boxes, but in the event of a bad placement of a cube in the lift, the two wheels will take them easily out of the robot.



The Lift:

Components:

- 2x Servo Motors;
- 2x Servo Motor Holders;
- 2x L Brackets;
- 1 Platform; (The lift);
- 2x Sliders
- 1x Andy Mark Motor;
- 1x Tetrix Motor Holder;

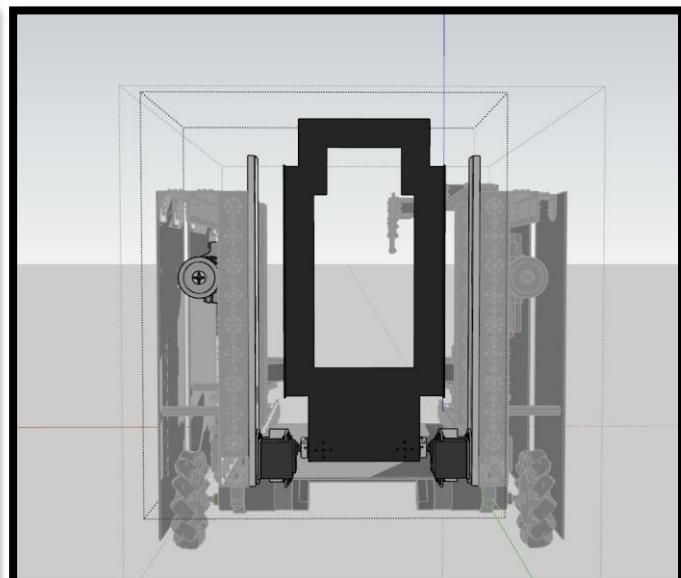
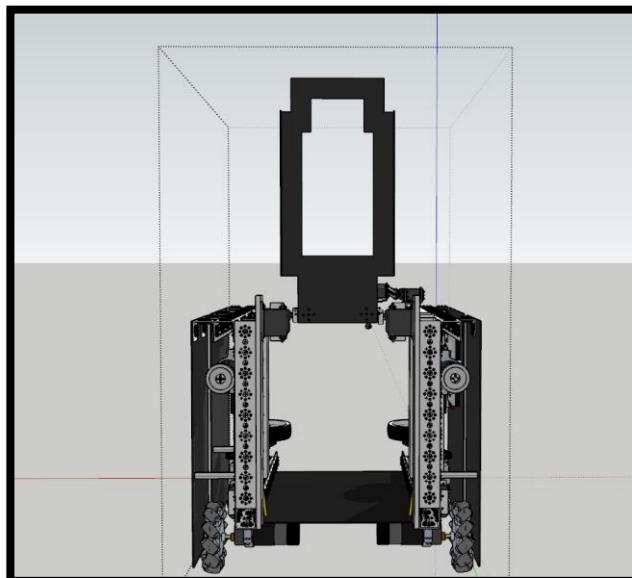


The lift was the most difficult part to build. In the process where involved many precise measurements and cuts.

The Andy Mark Motors determines the ascension of the lift by pulling up the servo motors which are attached to the platform with 2 L Brackets.

The platform had several adjustments made, such as the small side walls which assures a straight position for the boxes when staying in the lift, and the interior cut which was made to loosen up its weight.

The Lift goes hand in hand with the Vacuum-type Mechanism, which helps the robot transport much more precisely and faster the cubes to the cryptobox.

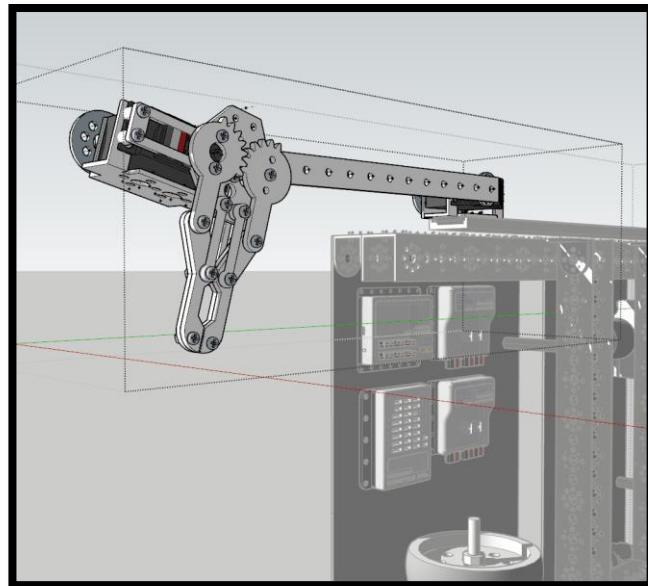




The Clipper:

Components:

- 1x Slider;
- 2x Tetrix 160 mm C-Channels for the slider to be placed high enough for it to go over the fence;
- 1x Andy Mark Motor;
- 1x Printed Wheel;
- 2x Servo Motor;
- 2x Servo Motor Holder;
- Rope for the slider to move;
- 1x Clipper;



One of the Servo Motor is used for rotating the clipper 180 degrees in order to rise the relic and the second one is used for the clipper, which determines its two parts to revolve, creating space to take the relic. With the help of the slider, whose expansion is caused by the Andy Mark Motor, the relic can travel outside the arena.

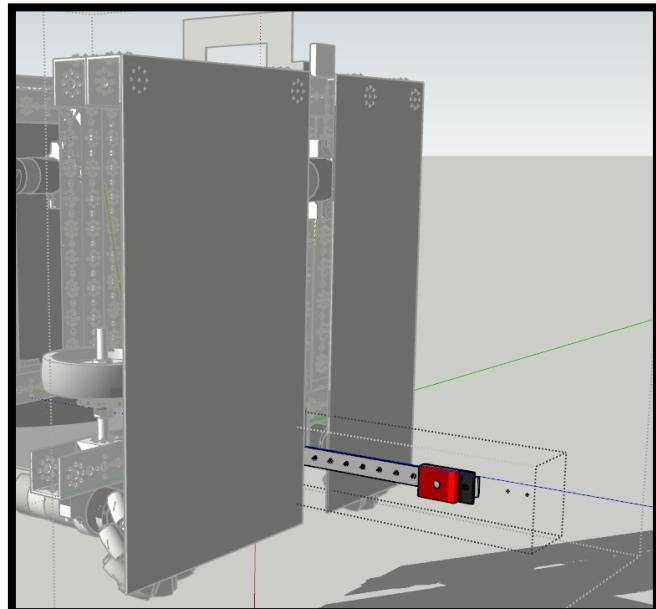
The Sensor Bar:

Components:

- 1x Servo Motor;
- 1x Servo Motor Holder;
- 1x Colour Sensor;
- 1x Tetrix 288 mm bar;

This function of the robot is used in the autonomous part. There is one on each of the robot, just to keep the robot's symmetry.

This part was added after the Cluj Competiton;



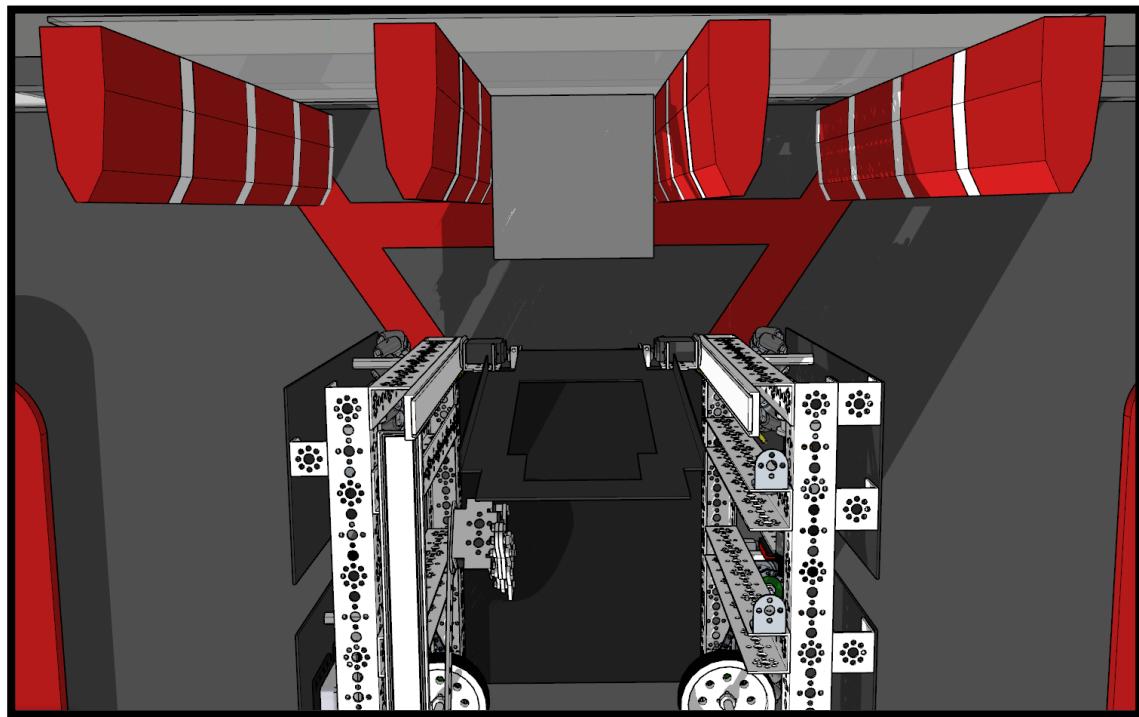
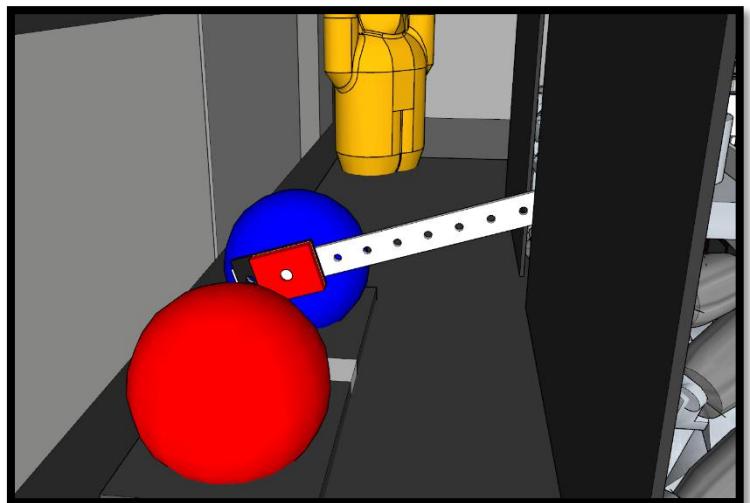
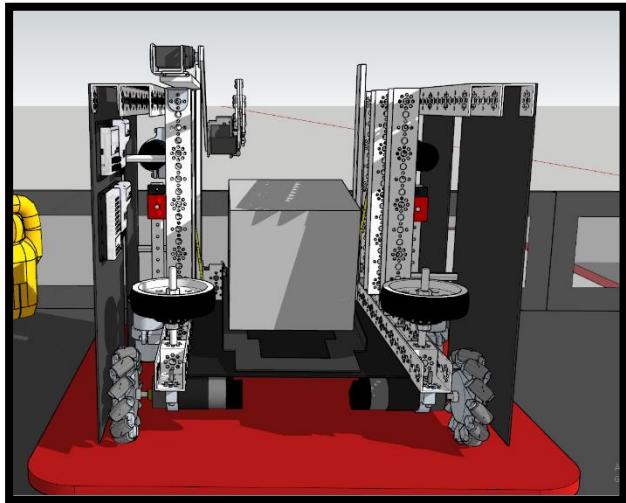


Shorty in The Arena

In the following examples are represented the new functions of Shorty, both from the Autonomous and the Tele OP period.

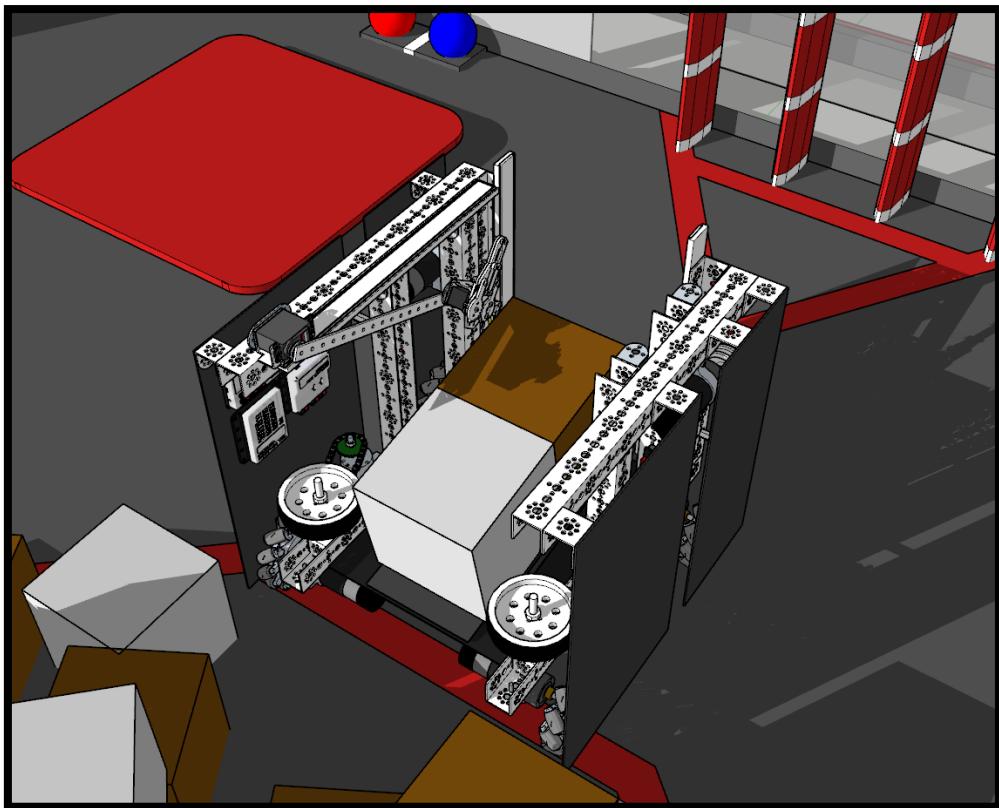
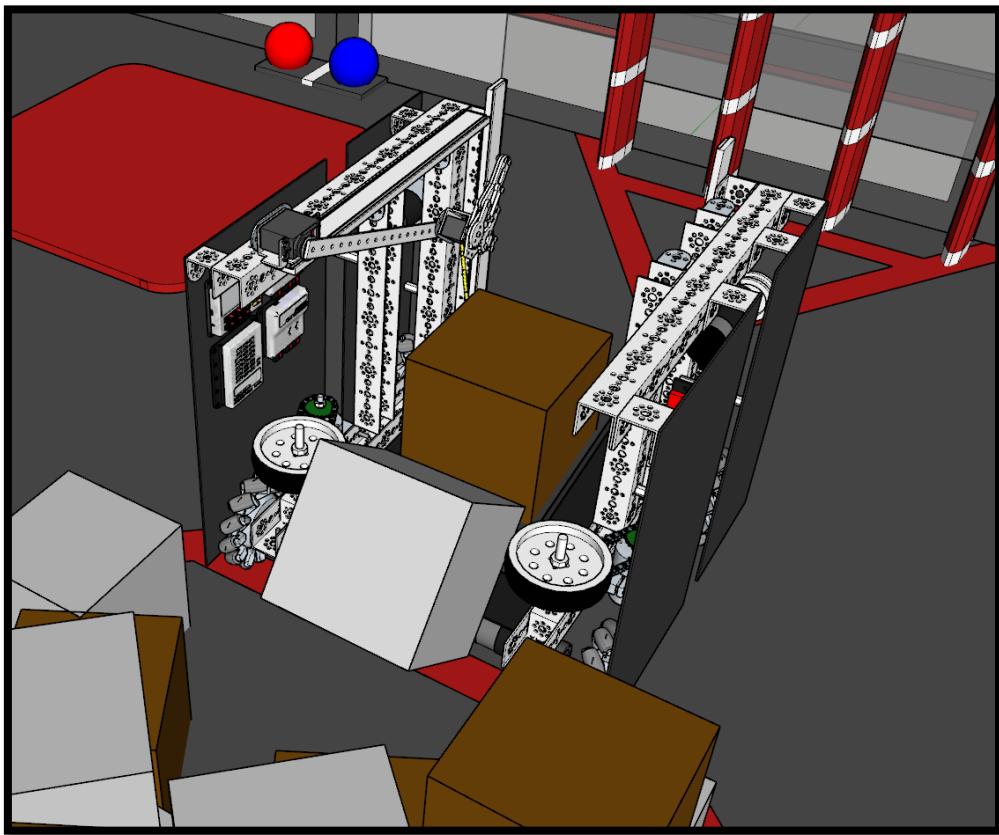
We worked hard to make Shorty ready for the competition, having everything prepared for any kind of challenge in the arena! We are proud to have Shorty in our family and we expect nothing but good results from it.

The Autonomous Period:





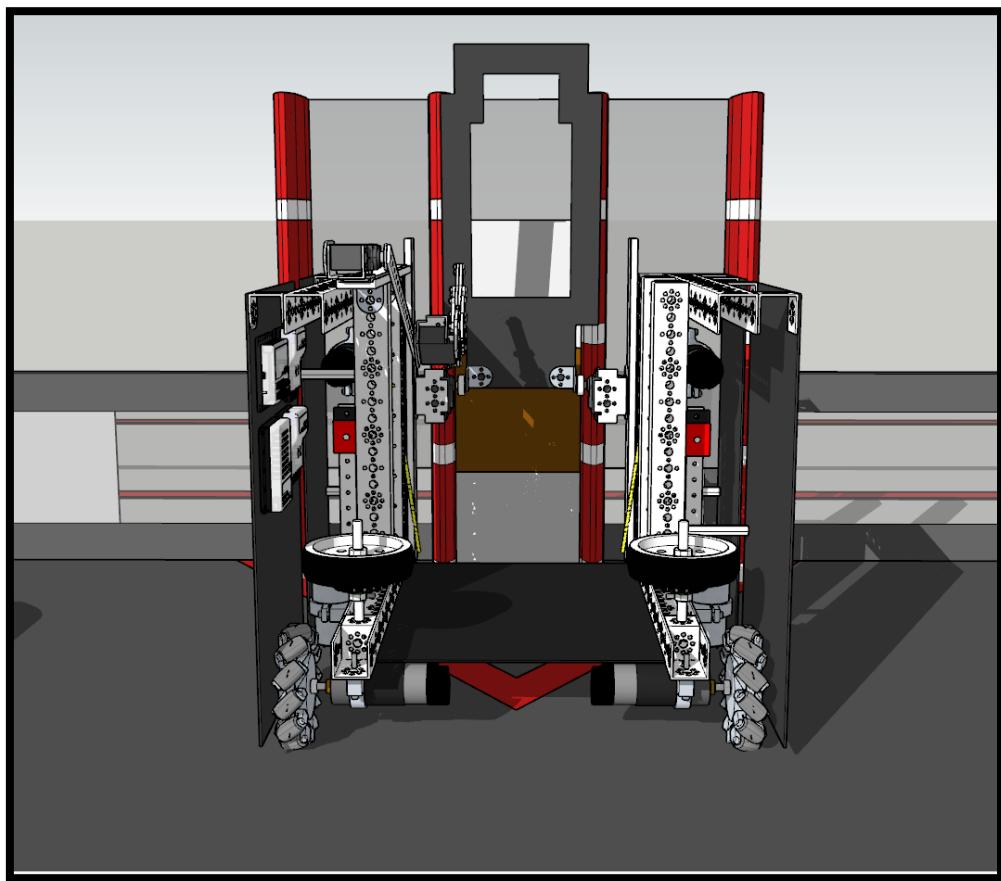
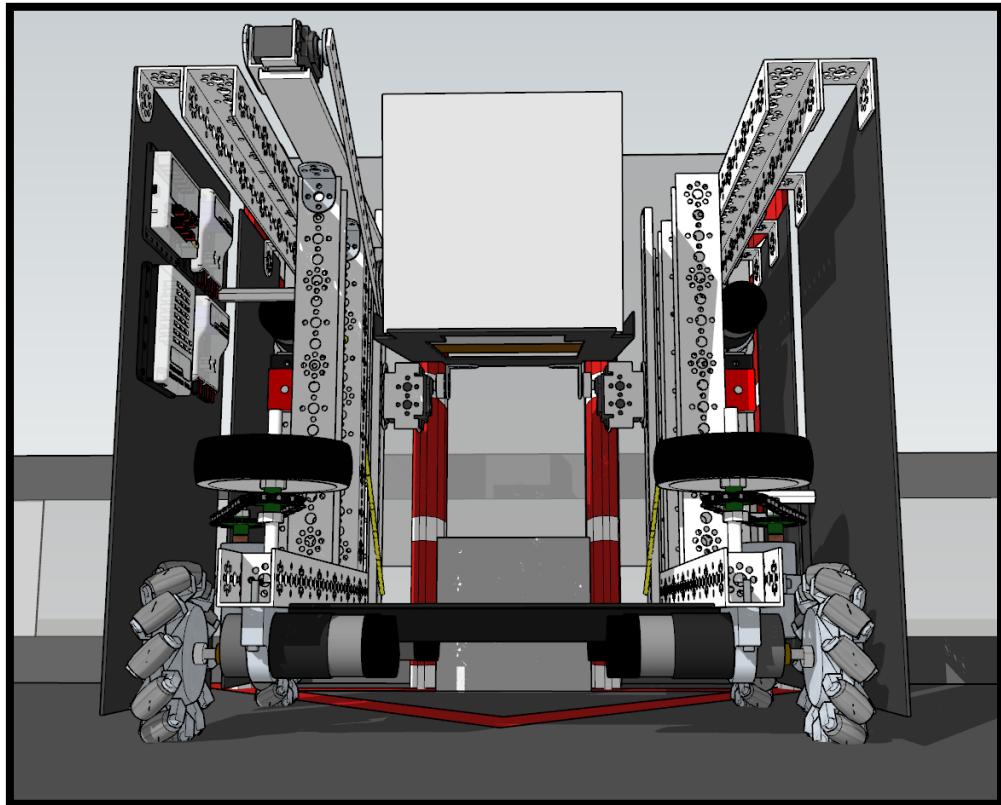
The Tele Op Period:



Team #R0 044



Circuit Dealerz



Team #R0 044



Circuit Dealerz

7. ROBOT INTELLIGENCE



Autonomous period

initialization

```
public void initialization() {
    L_1 = hardwareMap.dcMotor.get("L_1");
    L_2 = hardwareMap.dcMotor.get("L_2");
    R_1 = hardwareMap.dcMotor.get("R_1");
    R_2 = hardwareMap.dcMotor.get("R_2");

    L_1.setDirection(DcMotorSimple.Direction.REVERSE);
    L_2.setDirection(DcMotorSimple.Direction.REVERSE);

    rangeSensorFata = hardwareMap.get(ModernRoboticsI2cRangeSensor.class, "range_sensor_f");
    rangeSensorDreapta = hardwareMap.get(ModernRoboticsI2cRangeSensor.class, "range_sensor_dr");
    rangeSensorStanga = hardwareMap.get(ModernRoboticsI2cRangeSensor.class, "range_sensor_stg");

    servo_bila_dr = hardwareMap.servo.get("sbd");
    servo_bila_stg = hardwareMap.servo.get("sbstg");
    servo_dr = hardwareMap.servo.get("scd");
    servo_stg = hardwareMap.servo.get("scstg");

    //trebuie vazut daca e 1 sau 0
    servo_bila_dr.setPosition(1);
    servo_bila_stg.setPosition(0);
    servo_stg.setDirection(Servo.Direction.REVERSE);
    servo_dr.setDirection(Servo.Direction.REVERSE);
    servo_dr.setPosition(1);
    servo_stg.setPosition(0);

    colorsensor = hardwareMap.colorSensor.get("color");

    gyro = (ModernRoboticsI2cGyro) hardwareMap.gyroSensor.get("gyro");

    gyro.calibrate();
```

This is the function for initializing and declaring each motor.



setMotors

```
public void setMotors(double bottomLeftMotorPower,
                      double bottomRightMotorPower,
                      double frontLeftMotorPower,
                      double frontRightMotorPower) {
    L_1.setPower(frontLeftMotorPower);
    L_2.setPower(bottomLeftMotorPower);
    R_1.setPower(frontRightMotorPower);
    R_2.setPower(bottomRightMotorPower);
}
```

This function sets the power for each wheel.

Jewel

```
public void jewel(double power) {
    if(colorsensor.blue() > colorsensor.red()){
        setMotors(power,power,power,power);
        sleep(400);
    }
    else{
        setMotors(-power,-power,-power,-power);
        sleep(400);
    }
    setMotors(0,0,0,0);
}
```

This function uses the color sensor to remove the enemy alliance Jewel it uses a Color Sensor to find if there is more red than blue in the light reflected by the Jewel



Drive

```
public void Drive(double distance,
                  double leftbottompower,
                  double leftfrontpower,
                  double rightbottompower,
                  double rightfrontpower,
                  double power,
                  ModernRoboticsI2cRangeSensor rangeSensor) {

    if(rangeSensor.getDistance(DistanceUnit.INCH) >= distance) {
        L_1.setPower(leftfrontpower);
        L_2.setPower(leftbottompower);
        R_1.setPower(rightfrontpower);
        R_2.setPower(rightbottompower);
    }

    while(rangeSensor.getDistance(DistanceUnit.INCH) >= distance) {

        L_1.setPower(0.0);
        L_2.setPower(0.0);
        R_1.setPower(0.0);
        R_2.setPower(0.0);

        if(gyro.getIntegratedZValue() > 1) {
            setMotors(power,-power,power,-power);
        }
        else if(gyro.getIntegratedZValue() < -1) {
            setMotors(-power,power,-power,power);
        }
        else{
            setMotors(0,0,0,0);
        }
    }
}
```

This is the function we use to make the robot go in a certain direction until it finds an object near it , we use it to spot the columns or the wall



Rotation

```
public void Rotation(double power, double angle){  
    while(gyro.getIntegratedZValue() < angle){  
        setMotors(-power,power,-power,power);  
    }  
    setMotors(0,0,0,0);  
}
```

This rotates the robot until it reaches a certain angle.

Glyph

```
public void gliph(){  
    servo_stg.setPosition(0.55);  
    servo_dr.setPosition(0.45);  
    sleep(1000);  
    servo_dr.setPosition(1);  
    servo_stg.setPosition(0);  
}
```

This is used to put the glyph in the cryptobox. It sets the position of the servos to rotate the Platform.



RunOpMode

```
@Override
public void runOpMode() throws InterruptedException {
//sunt toate functiile terminate
    // functia de deplasare(orice fel) si de rotatie
    //functia care determina culoarea bilei
    //functia de punere a cutiilor in dulap
    //initializarea
    initialization();

    waitForStart();

    servo_bila_dr.setPosition(0);

    jewel(0.3);

    Drive(50,1,1,1,1,0.5,rangeSensorFata);

    Rotation(0.8,90);

    Drive(24,1,1,1,1,0.5,rangeSensorFata);

    gliph();

}
```

This is the main function, we first initialise, after that we wait for start, when autonomous begins we select the jewel , then drive forward , rotate, then Drive forward again and score the glyph



TeleOp period

getInput()

```
public void getInput(){
    inputX = gamepad1.left_stick_x;
    inputY = -gamepad1.left_stick_y;
    input2X = gamepad1.right_stick_x;
    input2Y = -gamepad1.right_stick_y;
    button_y = gamepad2.y;
    button_x = gamepad2.x;
}
```

`getInput()` is used to retrieve and store all gamepad information.

It is one of the elementary functions and is used in all the more complex functions



setDirections()

```
public String setDirection() {  
    getInput();  
    if (inputX >= 0 && inputY > 0) {  
        tan = inputX / inputY;  
        if (tan >= tan_zero && tan <= tan_alpha)  
            return "Est";  
        else if (tan > tan_alpha && tan <= tan_3alpha)  
            return "Nord-Est";  
        else if (tan > tan_3alpha)  
            return "Nord";  
    } else if (inputX < 0 && inputY > 0) {  
        tan = inputX / inputY;  
        if (tan <= -tan_3alpha)  
            return "Nord";  
        else if (tan > -tan_3alpha && tan <= -tan_alpha)  
            return "Nord-Vest";  
        else if (tan > -tan_alpha && tan <= tan_zero)  
            return "Vest";  
    } else if (inputX >= 0 && inputY < 0) {  
        tan = inputX / inputY;  
        if (tan >= tan_zero && tan <= tan_alpha)  
            return "Vest";  
        else if (tan > tan_alpha && tan <= tan_3alpha)  
            return "Sud";  
    } else if (inputX < 0 && inputY < 0) {  
        tan = inputX / inputY;  
        if (tan <= -tan_3alpha)  
            return "Sud";  
        else if (tan > -tan_3alpha && tan <= -tan_alpha)  
            return "Sud-Est";  
        else if (tan > -tan_alpha && tan <= tan_zero)  
            return "Est";  
    }  
    else if(inputY == 0){  
        if(inputX > 0)  
            return "Est";  
        else if(inputX < 0)  
            return "Vest";  
    }  
    return "0";  
}
```



`setDirection()` is one of the more complex functions.

Using the `getInput()` function, it takes over the coordinates in the x0y axis system of the left stick position.

These are intended to determine the direction of movement of the robot.

First I drew the circle of radius 1 in which the stick can be moved and divided into the four quadrants (I will also put the picture with the circle in the dials).

And I also divided it in 8 directions (N, N-E, E, S-E, S, S-V, V, N-V).

Thus, we obtained 16 congruent angles equal to 22.5 degrees ($\pi / 8$ radians). I will note the value of 22.5 degrees with alpha

I used the fact that the tangent of the angle in the first quadrant is strictly increasing, in the 2 st strictly decreasing dial, in the 3 rd dial strictly increasing

and in the 4th decreasing quadrant, so we managed to avoid division at 0 (to determine the tangent).

Thus, if the stick is in the first quadrant (ie if both coordinates are positive) then we have 3 cases.

1. The tangent of the right angle that joins the position of the stick with the origin (let's call it beta) is greater than tan (0) and less tan (alpha).

Direction will be then east (I mean right).

2. $\tan(\beta) > \tan(\alpha) \&\& \tan(\beta) \leq \tan(3 * \alpha)$

Direction will be N-E (ie diagonal right up)

3. $\tan(\beta) > \tan(3 * \alpha)$

Direction will be N (In front)

So dividing into quadrants helped me avoid $\tan(4 * \alpha) = \tan(90) = \text{infinite}$.

I hope you can do it yourself for the other dials. It's exactly the same thing, just change some stuff ;)

Variables:

`inputX` = the x coordinate of the stick



inputY = the y coordinate of the stick

tan = tangent of beta

tan_zero = tangent of zero

tan_alpha = tangent of alpha(22,5 grade)

tan_3alpha = tangent of 3*alpha(3*22,5 grade)

Observations:

Since $\tan(112,5) = \tan(5 * \text{alpha}) = -\tan(\text{alpha})$, we have not created a new variable, but we have put the mark - tan_alpha variables

Same for $\tan(157,5) = \tan(7 * \text{alpha})$

The same thing happens in the other quadrants.

Finally, if the y coordinate of the stick is 0, then we have 2 options:

1. The robot goes to the right for $x > 0$.
2. The robot goes to the left for $x < 0$.

At the end of the program, it returns 0. That means the robot stops. The stick is in the coordinate (0,0).



setMotors()

```
public void setMotors(double bottomLeftMotorPower,  
                      double bottomRightMotorPower,  
                      double frontLeftMotorPower,  
                      double frontRightMotorPower) {  
    L_1.setPower(frontLeftMotorPower);  
    L_2.setPower(bottomLeftMotorPower);  
    R_1.setPower(frontRightMotorPower);  
    R_2.setPower(bottomRightMotorPower);  
}
```

setMotors() is one of the most basic functions.

It sets the power of the motors according to the value of the local parameters that the function receives.

Variables:

direction = the variable that receives from the setDirection() function, the direction in which the engine should go.

rotation = the variable that receives from the setRotation() function, the rotation of the robot

If the robot does not rotate, then it will go in one of the eight directions.

With the setMotors() function, the powers are transmitted corresponding to the direction of the motor displacement.

This function determines in which direction the robot will rotate.

Trigonometric = to the left

Anti-Trigonometric = right

False = does not rotate

The function gets values from the getInput() function.



setPower()

```
public void setPower() {
    String direction = setDirection();
    String rotation = setRotation();
    if(rotation != "False") {
        switch (direction) {
            case "Nord":
                setMotors(power, power, power, power);
                break;
            case "Sud":
                setMotors(-power, -power, -power, -power);
                break;
            case "Est":
                setMotors(-power, power, power, -power);
                break;
            case "Vest":
                setMotors(power, -power, -power, power);
                break;
            case "Nord-Est":
                setMotors(0, power, power, 0);
                break;
            case "Sud-Vest":
                setMotors(0, -power, -power, 0);
                break;
            case "Nord-Vest":
                setMotors(power, 0, 0, power);
                break;
            case "Sud-Est":
                setMotors(-power, 0, 0, -power);
                break;
            case "0":
                setMotors(0, 0, 0, 0);
        }
    } else{
        switch (rotation) {
            case "Trigonometric":
                setMotors(power,-power,power,-power);
                break;
            case "Anti-Trigonometric":
                setMotors(-power,power,-power,power);
                break;
        }
    }
}
```



Variables:

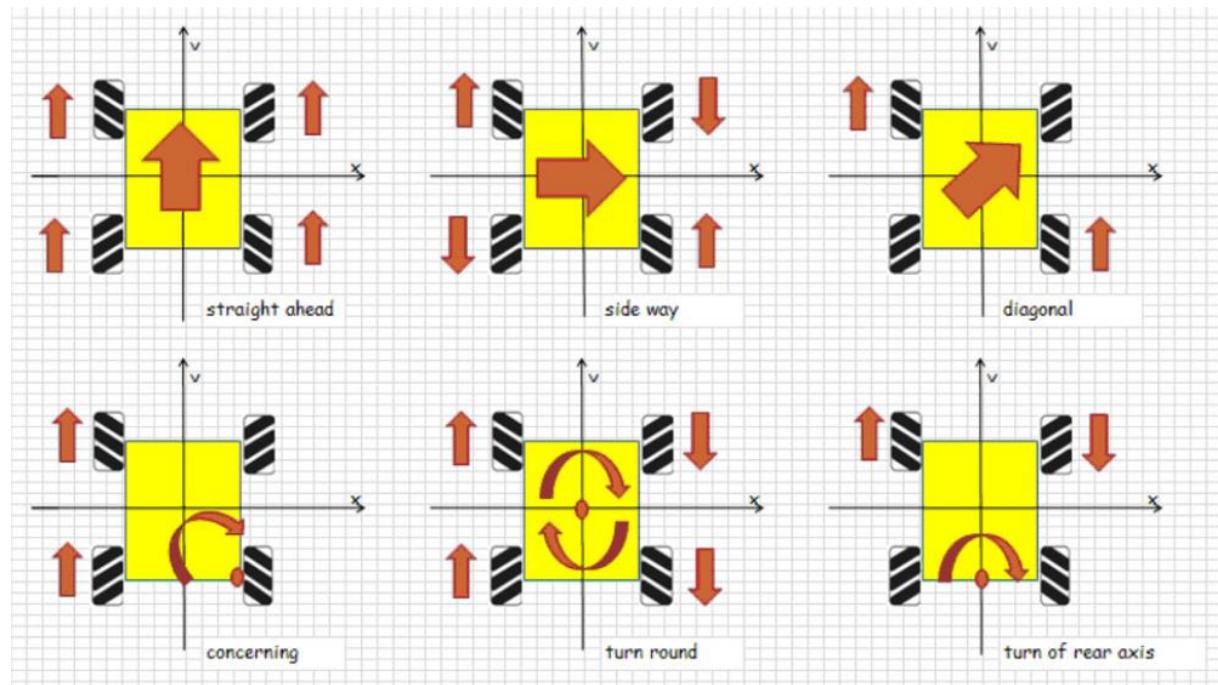
direction = the variable that receives from the setDirection () function, the direction in which the engine should go.

rotation = the variable that receives from the setRotation () function, the rotation of the robot.

If the robot does not rotate, then it will go in one of the eight directions.

With the setMotors () function, the powers are transmitted corresponding to the direction of the motor displacement.

I also attached a picture of the direction of rotation of each wheel to go in a certain direction.





setRotation()

```
public String setRotation(){
    getInput();
    if(input2Y != 0 || input2X != 0){
        if(input2Y > 0)
            return "Trigonometric";
        else if(input2Y < 0)
            return "Anti-Trigonometric";
    }
    return "False";
}
```

setRotation() function determines in which direction the robot will rotate.

Trigonometric = to the left

Anti-Trigonometric = right

False = does not rotate

The function gets values from the getInput () function.



collect() and anticollect()

```
public void collect() {
    collect_motor_1.setPower(gamepad2.right_trigger*0.8);
    collect_motor_1.setPower(gamepad2.right_trigger*0.8);
}

public void anticollect() {
    collect_motor_1.setPower(-gamepad1.left_trigger*0.8);
    collect_motor_1.setPower(-gamepad1.left_trigger*0.8);
}
```

The 2 functions- collect() and anticollect() -are used for collecting the boxes of the robot.

dulapior()

```
public void dulapior(){
    if(gamepad2.a == true)
        button_a = 0.5;
    else
        button_a = 0;
    servo_cutii_stg.setPosition(button_a);
    servo_cutii_dr.setPosition(button_a);
}
```

dulapior() function is intended to topple the platform on which the boxes are placed to put them in the Cryptobox.



ridicare()

```

public void ridicare() {

    getInput();

    int newTarget = 0;

    double putere;
    if(button_y == true) {
        putere = 0.5;
        newTarget = 100;
    }
    else if(button_x == true) {
        putere = -0.5;
        newTarget = 100;
    }
    else {
        putere = 0.0;
        newTarget = 0;
    }

    ridicare_dreapta.setTargetPosition(newTarget);
    ridicare_stanga.setTargetPosition(newTarget);

    ridicare_dreapta.setMode(DcMotor.RunMode.RUN_TO_POSITION);
    ridicare_stanga.setMode(DcMotor.RunMode.RUN_TO_POSITION);

    ridicare_dreapta.setPower(putere);
    ridicare_stanga.setPower(putere);

    while (ridicare_dreapta.isBusy() && ridicare_stanga.isBusy()) {

    }

    ridicare_dreapta.setPower(0.0);
    ridicare_stanga.setPower(0.0);
}

```

The function `ridicare()` is divided into several "modules".

1. retrieves from the `getInput()` function the required information from the gamepad to accomplish its purpose.

2. Depending on which button is pressed, the function sends power to the motors to lift / lower the platform on which the boxes are placed to place them in different rows of the cabinet

1'. If the y button has been pressed, the platform will rise to a level.



2'. If the x button has been pressed, the platform will go down one level.

This function is the only function of the remote control period that uses the encoders of the motors.

To be more explicit, the function will not only give it power to the engine, but it will also tell her how many steps it will take.

Thus, we set the engines to raise / lower with exactly one level.



8.INNOVATION



Our robot is like many others in concept, however the execution and details are what separates us from the other teams.

The engines

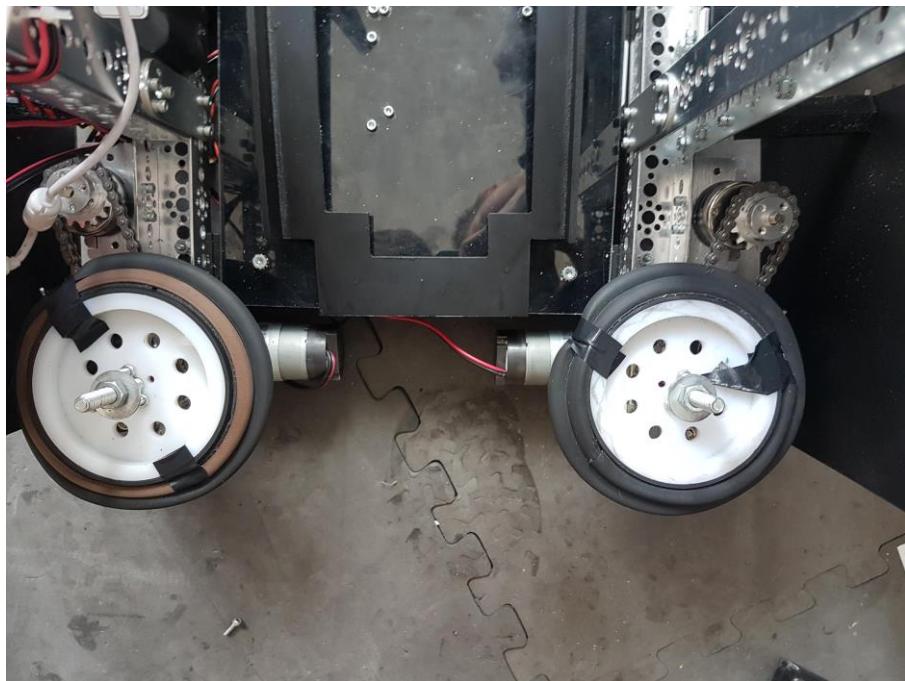
The placement of the engines under the base of the robots and having our robot rest on the axles of the motors is one thing we can be quite proud of. We calculated mass of the robot, and then with the help of our Mentor which is a Physics Teacher we estimated the load it would put on the motors. In order to find out if it could bend the Axles, to our surprise, after a few hours of surfing the web we found out that this is very unlikely and can happen only after years of usage.





The vacuum system and glyph placing system

The Vacuum wheels have Rubber bands on them which allow for a better grip while being gentle on the surface area so that we don't get any penalties for damaging the Glyphs.



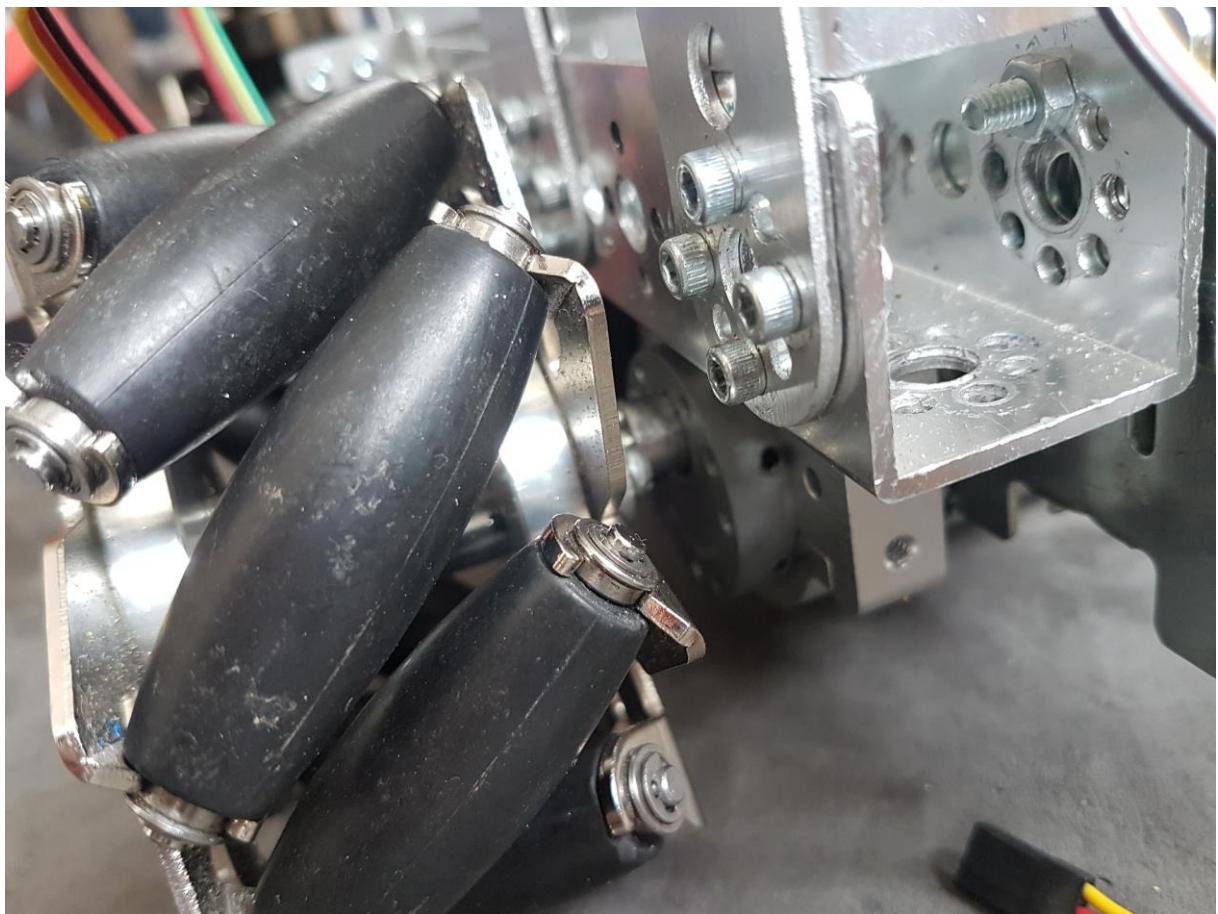
Our Platform used for the Glyphs is unique, we used a CNC to cut Acrylonitrile (Plexiglas) in the form we have down, because the hole on the inside damaged the Platform's mechanical resistance we glued two Plexiglas walls on the sides. Just to make sure that the Servos can rotate the Platform easily we put 2 counterweights on the back of the Platform.





MakeBlock Mecanum Wheels

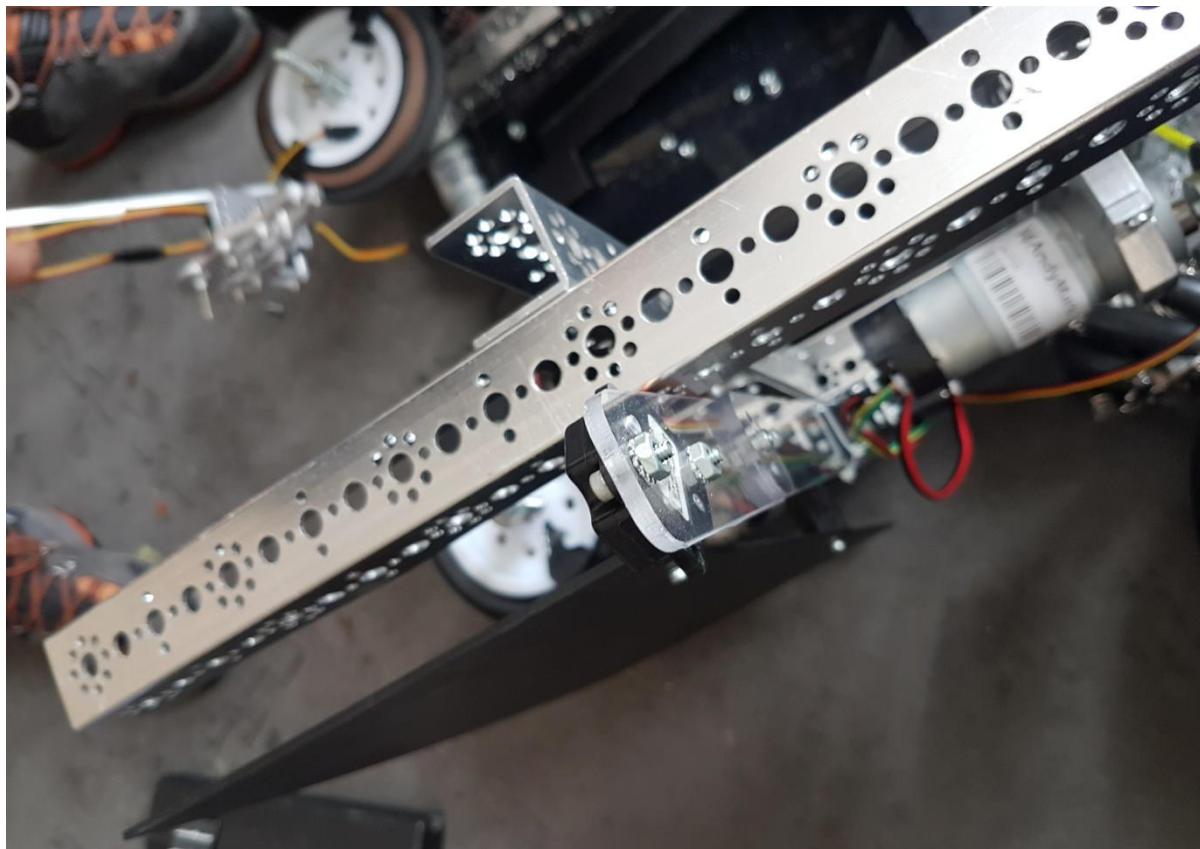
We also enjoy a lot our MakeBlock Mecanum Wheels, they have very smooth ball bearings, and allow for a very precise strafing, which helps us in placing the Glyphs, as rotating and takes a lot of time.





Color-sensor arm

We made our own arms for the Color sensors, they are cut of Plexiglas at the CNC, as Plexi is a light material. At first we wanted to make them out of only one piece, but they were too big for the CNC so we made them out of two.

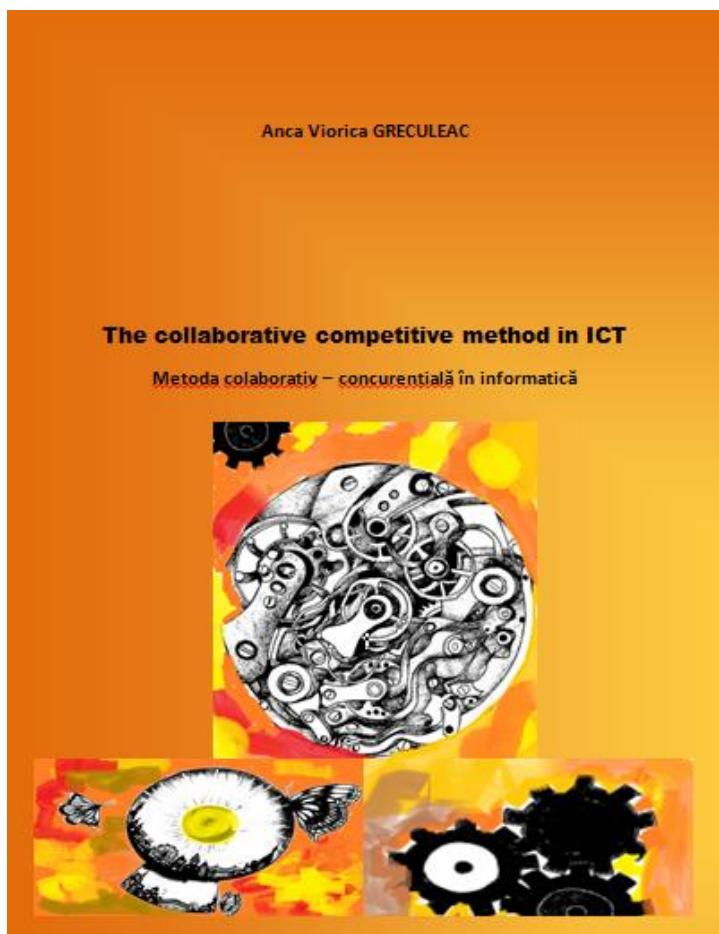




THE COLLABORATIVE-COMPETITIVE METHOD IN ICT

The team mentor has been coordinating the college club for over 10 years. In this capacity, she identified students who have an innovative potential, encouraged them to join the inventive club, organized them mentoring programs through which they practiced the stages of making an invention, organized them into subgroups of the interests of certain subjects and gave them support in carrying out the chosen school studies. These experimental studies are designed to develop STEM competences that far exceed the level of school curriculum and to learn the stages of an invention. The portfolio of national and international awards made by members of the inventive club is rich and varied. In practice with students, the inventor's club coordinator has focused on various working methods. Thus, she has innovated a method of work, called the competitive collaborative method, which she published. The method involves paralleling the same stage by two subgroups, giving each other help, then evaluating the partial results and adopting what is considered to be the best. Then a new collaborative competitive sequence begins.

This method was used in the robotics club when the organizational structure of the team was dual (there were two groups that were successively involved in design, installation, software and PR). From the book published by the mentor on the working method, the following chapters are relevant:





1. Introduction

The collaborative-competitive method was innovated within the institutional collaboration between *Petru Rares* National College in Suceava, a unit being part of the pre-university educational segment, *Stefan cel Mare* University of Suceava (Faculty of Electrical Engineering and Computer Science) - an institution which is part of the technical university learning segment in Romania and *Children's Palace* Suceava - an unit whose object of activity is represented by finding and nurturing talented children in various domains. The collaboration was based on a partnership, initially signed for 5 years then extended annually. It includes activities of non-formal education, undertaken in order to complete formal education, develop innovative spirit at children and youth through the practice of innovation and scholar invention, identify and exploit the pathways to the labour market as well as to the university branches to complete education. The quality of education provided by all these institutions is externally and periodically evaluated, being highly marked for the majority of indicators.

The collaboration included afterwards *Cygnus Scientific Society*-Suceava Unesco Center, a nongovernmental organization which develops activities whose main purpose is promoting the fundamental human values through science and *The Centre for Complex Studies*, led by a member of The Romanian Academy of Scientists, a nongovernmental organization which promotes activities of inter and trans-disciplinary research.

Although they were diverse as far as structure is concerned, the entities of the partnership managed to maintain and develop the collaboration between them taking advantage of the differences of structure (compulsory education/ university education/ vocational education on demand and formal education/ non-formal education) and differences of age (secondary education/ tertiary education).

In the framework of this partnership there were conducted:

- collaborative sequences, in which partners worked together (attending conferences on the subject of society based on knowledge, organizing summer camps revolving around scientific themes, supporting outstanding children from Suceava, by making available the access to technique, technology and further to information, to working in virtual teams etc., purchasing common experimental sealants, realizing studies of scholar research on themes selected in common, usually inter-disciplinary, organizing public presentations, scientific colloquia, contests etc.). The emphasis within this sequence laid on the complementarities of resources and structural as well as functional characteristics of partners.

- competitive sequences, in which partners had to evaluate in terms of quality the results of their work, as superstructure, but also as individualities appealing to self-assessment, not to mention the



external experts. The purpose of the evaluation was, as usual, to generate good results and practices, validate them by global applying within the partnership and studying the possibilities of transferring them out of it. There were also conducted evaluations of the competences developed by children after completing a cycle of work, or more, during which it was noticed the trajectory of their professional orientation.

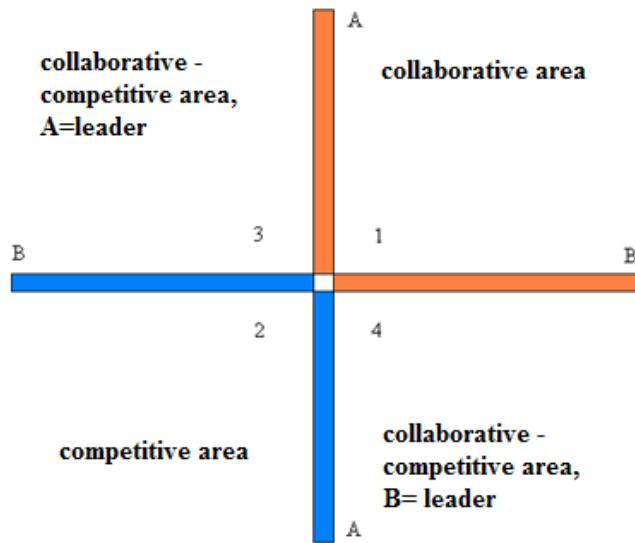
To avoid impediments and to create a format which allowed the conduct of the whole activity, it was theoretically determined and multiplying applied the collaborative-competitive method. It was applied by including in initial data the conclusions resulted from a cycle of application, thing which actually corresponds to the concept of total quality. The period of an application cycle varied, according to the activity conducted, between 6 months and a year.

The common elements of all activities were:

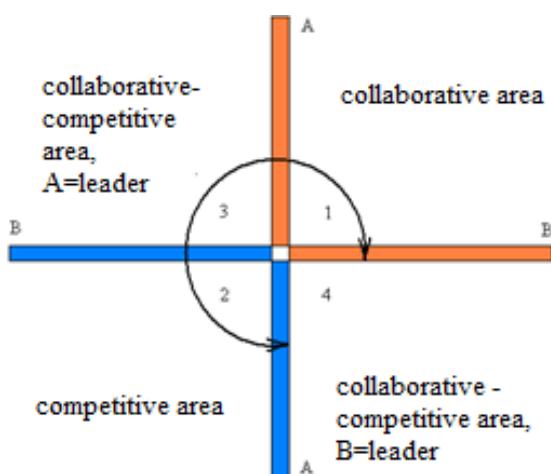
- including VET students (computer science) within all work groups and within all stages of carrying out the activities, in order to develop their cross-curricular competences (teamwork, real communication, divergent, critical thinking, possibility of anticipation, learning through collaboration, self-learning etc.);
- using TIC (Technology of Information and Communication) and programming sequence constantly in all activities. After the evaluation of evaluations, it was determined the fact that the final results, as well as the methods of work which were generalized between partners were based on at least one sequence of software (sometimes even a computing platform), usually created to support the current activities.



2. Description of the collaborative-competitive method



A and B are 2 possible partners (organizational structures) who accept to apply and innovate in the framework of the collaborative-competitive method. The vertical axis is the axis of one partner whereas the horizontal axis is the one of the other partner.



Quadrant 1, confined by the orange color, represents the collaborative area.

Quadrant 2, confined by the blue color, represents the competitive area.

Quadrant 3, represents the collaborative-competitive area where partner A assumes/gains the leadership position (the methods, results etc. developed by A become dominant).

Quadrant 4, represents the collaborative-competitive method where partner B assumes/gains the leadership position (the methods, results etc. elaborated by B become dominant).



Specific operations/activities for area 1:

-organizing common events pertaining to the collaborative type in order to cognize the creative, logistic, human etc. potential of each partner, exchange human resources for small segments of activity, carry out activities of socializing to develop an extended team spirit;

-organizing common events (presentations, workshops) with the purpose of studying the complementarities of partners;

-offering each other support at essential points, relating to the activity of collaboration, solving or bypassing them;

-developing skills in the following order: adapting-adjusting-transforming-assimilating by working together;

-repeating the collaborative-competitive process using a new loop, after completing the processes from the areas 1, 2, 3, 4, according to TQM practices(total quality management).

Specific operations/activities for area 2:

-organizing in parallel the same kind of activities, with the same target, each collaborator making use of their own methods, resources etc; obtaining final products for a particular period of time. There is no refusal, no postponement etc;

-organizing common events (contests, festivals etc.) which aim competition. The logistics of organization is divided for all partners;

-external or common judging of final products and methods, with the acceptance, without contesting, its results;

-eventual patenting of inventions, respecting author's rights.



Specific operations/activities for areas 3 and 4:

-implementation of methods, utilizing the final products (with the disposal of author's rights) designated as the most valuable, in a uniform format, appreciated to be the most successful by judges, by both partners, under the coordination of the partner indicated as winner (area 2);

-studying the differences resulted from the specificity of each partner, within the process of implementing the methods and final products which have won;

-improvement of methods and final products which have won;

-fructifying these for organizational, educational (lifelong learning), occupational purpose.

3. Possible benefits of the method

-possibility of transferring the method to all structures of VET learning (scholar institutions with other profile than informatics, or their superstructures);

-capacity of using the method with a large number of domains/areas of activity (generally, the educational domain, where the partners can be educational systems or human development organizations, whatever their type: professional development /reconversion, scientific domain, economic domain, mass-media domain, political domain etc);

-fructifying the benefices of teamwork (more organizations/ more persons), comparable to the benefices of individual work (one organization/ one person);

-benefiting, for free, from valuable results, even when own results were not as good as the partner's ones;

-generate and maintain a feeling of belonging to a super-organization;

-raising the value of method by including a larger number of partners.

-by continuously repeating the cycle of method (according to spiral model), a state of self-organization can be reached, which maintains the partner entities in a steady state;

-possibility of avoiding internal crisis;

-possibility of refining the method by using it;

-the method stimulates individual and collective creativity, fair-play spirit and can lead to raising the organizational maturity level;



-lower costs within collaborative-competitive method than within pure competitive method;

-this method can revolutionize organizational systems already existing (including the EU organization and operation), but it can also generate new organizational structures (or new organizational levels).

4. Possible risks of the method

-the need to identify a bet/ a trigger to realize the association and for cyclic resumption of the approach proposed by this method;

-the need to engage multiple resources (warm resources, cold resources, time resources difficult to be estimated, communication and advertising resources, external resources for judging etc.);

-the risk of managing with difficulty the method by multiplying the number of partners (as far as necessity for more resources and organizational specificities are concerned), the increased number of partners being actually a benefit for this method;

-the speculative attitude of one/some of the partners (being involved in all sequences, excepting for the competitive one, with the purpose of benefiting from partner's approved results-products and methods, good practice, motivated human resource);

-deliberate blocking, from inside, of resumption of method.



5. Preliminary conclusion

Any institutional collaboration, or of non-formal type, will:

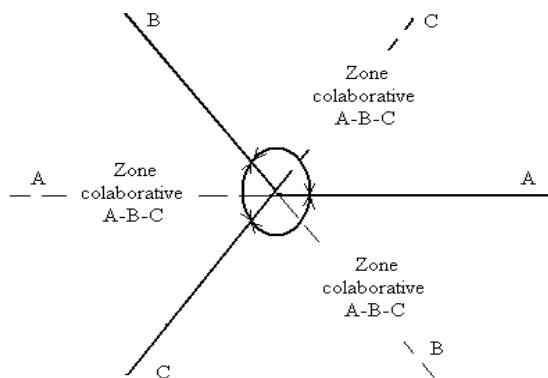
-be a way of validating the collaborative-competitive method between the partners of project, A and B, with the possibility of being multiplied according to the number of partners;

-will be a way of refining the method, with the possibility of drawing conclusions irrespective of social characteristics, of organizational structures etc.

8. Possibilities of Improvement of the collaborative and concurrential method

8.1 The generalisation of this method for a larger number of partners.

In case of the existence of more partners who could adopt the collaborative and concurrential method in their activity, for instance three, the collaborative zone between them can be one of the three regions of the plane figure below. It is possible to choose each one of them or you can choose one especially, according to the preferencial role of the partners.

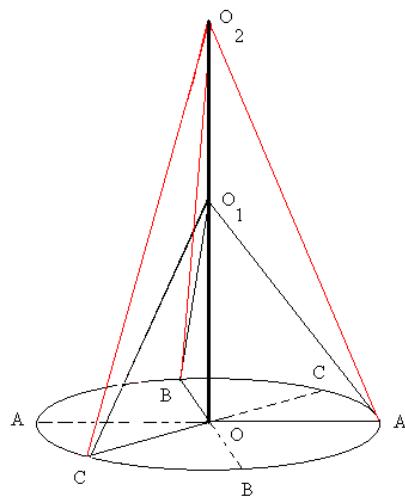


The concurrential region is represented by the height 001,002 etc., considering the curl transited by the partners at a certain moment.



If, for example, these occur to be at their first „confrontation” then, as a consequence of the valuable weighing between them on the oval height and if A is the appreciated as being the most valuable partner than the subsequent collaborative region will be the third part of the cone O1OBC, having the A partner in the showiness.

If after this on the O1O2 subsequent collaborative region the B partner wins then, as the subsequent collaborative region will be the third part of the cone O2OAC, this time having B in the singularity. The entire previous experience of the partners is in this way capitalised and there are generalised as the most important methods and final products.



If the number of partners is bigger than three than the initial circle it is divided in a number equally with the partner's numbers and the special construction is continued, having the purpose of the functionality of the collaborative concurrential method.



8.2 Philosophical interferences

The collaborative zones between two different entities (marked with "id" from the figure below) represents the conceptual expression of the consens, and the peculiarity zones (marked with "dif" in the same figure) the conceptual expression of the conflict.

The consens, the ideas, the common notes marks, set up the team/ the overteam, prove scientifically the method, awarding partial identities to the collaborators, as long as the agreement, special condition of their collaboration, is maintained. On contrary, the conflict built on the partners' own marks, that also make the difference between them and gives them identity, applies the method and represents a condition of the concurrency, of the disagreement for the functional maintenance of these identity zones, there is needed a certain demarcation, which can make the running of the collaborative concurrential method efficient. This delimitation can be represented by the diagonal of the big square, which crosses both the collaboration zone and the two concurrential zones, marked with grey in the figure below. The linear maintenance of these demarcations respects the optim dimentions of the conceptual expresions/(consens, conflict) and the practical ones(competition).

