Under the Auspices of
HRH Prince Abdulaziz bin Talal bin Abdulaziz

The Awards Ceremony of
The Second Cycle of King Abdulaziz Prize for
Scientific Researches on Childhood and Development

"The Empowerment of Arab Children in the Era
of the Fourth Industrial Revolution"

September 2021

Enriching Scientific Research for Better Human Life in the Arab World

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The Second Cycle of King Abdulaziz Prize for
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September 2021

The Arab Council for Childhood and Development (ACCD) is an Arab regional non-governmental organization with a legal identity, working in the field of childhood under the presidency of **HRH Prince Abdulaziz bin Talal bin Abdulaziz.** ACCD was founded in 1987 upon the initiative of **HRH the late Prince Talal bin Abdulaziz**, and a resolution issued by the Arab League's Conferance on «Chaildhood and Development» that was held in Tunisia in 1986.

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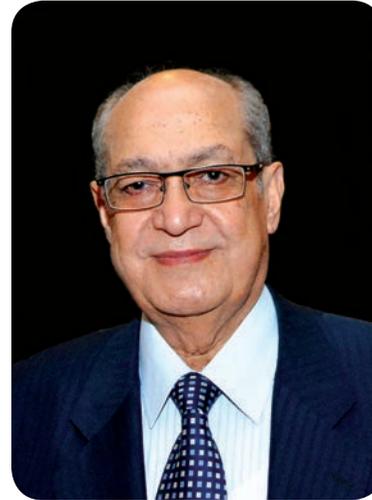www.arabccd.org   accd@arabccd.org

ArabCCD

«To emphasize the role of the Arab Council for Childhood and Development (ACCD) in supporting and stimulating research work in the field of childhood and development, and

To enhance the social dialogue on important issues related to the child and his/her upbringing,

I hereby announce the Second Cycle of the Prize with its theme "The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution" to reflect an awareness of the inevitable advent of this revolution for which we must be prepared».

HRH Prince Abdulaziz bin Talal bin Abdulaziz
President of ACCD

Introduction

When **HRH Prince Abdulaziz bin Talal bin Abdulaziz**, President of ACCD, announced in June 2019, that the theme of the Second Cycle of King Abdulaziz Prize for Scientific Researches on Childhood and Development (the Prize) was "**The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution**", it was to anticipate a future that will depend on the use of applications for emerging technologies in the field of artificial intelligence, robotics, the internet of things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, material sciences and others, accompanied with an intellectual revolution to deal with these advanced technologies. This requires us to be prepared to empower our children for this coming revolution to enter this new world.

But the COVID-19 pandemic, which has swept throughout the whole world in December 2019, has placed greater emphasis on the importance of this Fourth Industrial Revolution (FIR) with its components, tools, and concepts. The necessity for preparing for this newcomer has become a fateful and inevitable issue, as its world has been determined differently. It has designed a system that bears the features of a new post-pandemic world.

In fact, the theme of the Prize has stimulated many experts and researchers as reflected in the amount of researches received by the Prize Committee (62 researches from 19 researchers from nine Arab countries). In total, this has reinforced the importance and the intersection between the topic of the FIR with all childhood and its educational, social, economic and health related issues. Furthermore, this Cycle has enabled us to obtain applied researches that aspire to continue working to reach the best stages of implementation that we can benefit from, on a large scale in the Arab region.

In ACCD, we emphasize that we will proceed to follow the road that addresses childhood and all aspects of upbringing issues through this Arab Prize, seeking to build the aspired for enlightened intellectual approach, to develop a new mind, for a new human, in a new society.

Thanks are due to the patron of this Prize, HRH Prince Abdulaziz bin Talal bin Abdulaziz, President of ACCD, and to the spirit of its initiator and founder, the late HRH Prince Talal bin Abdulaziz, and to the strategic and supporting partner, the Arab Gulf Programme for Development (AGFUND), and the members of the Scientific Committee that included an elite group of Arab experts and referees. Thanks are also due to all the researchers who have submitted their valuable research in this cycle.

We also present our thanks to ACCD work team that has contributed to the preparation, organization and monitoring of the work of this Cycle, and which has concluded in a truly scientific manner.

Until the next Cycle.

Professor. Hassan Al-Bilawi
Secretary General of ACCD
Secretary General of the Prize

Background

Emerging from its vision and strategic orientation, ACCD has established a Prize in the domain of social and pedagogic research to present scientific researches around issues related to childhood and development and child rights. This emphasizes ACCD's role in stimulating discussions around the child's upbringing issues, collecting information to understand and tackle the status of children's upbringing. This role derives from ACCD's status as a house of expertise, producing and supporting national and regional guiding policies that achieve the child's best interests in the Arab nations.

HRH Prince Abdulaziz bin Talal with the winners of the First Cycle and the Scientific Committee.

The First Cycle:

In the light of the above, the First Cycle of the Prize was concerned with the issue of "Citizenship Education and Socialization", which had emerged from ACCD's concern for childhood, upbringing, and citizenship as priorities for raising the child in Arab countries, as well as ACCD's accumulated experience in that domain. This experience was crystalized in ACCD's initiative to present a new Model for Arab Child Upbringing «Education for Hope».

The Second Cycle:

In 2016, the world surprised us by coining the new expression: "FIR", which was launched in the Davos Forum and was defined by Professor Klaus Schwab as "the use of applications for emerging technologies in the field of artificial intelligence, robotics, the internet of things, autonomous vehicles, 3D printing, nanotechnology, biotechnology, material sciences and others, accompanied with an intellectual revolution to deal with these advanced technologies». This has necessitated that we prepare to empower our children for dealing with this revolution and entering this new world.

HRH Prince Abdulaziz bin Talal announces the theme of the Second Cycle:
"The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution".

Accordingly, the choice of theme for the Second Cycle of the Prize, "The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution", reflected the importance of this issue which ACCD had started working on since February 2018. Towards this end, a series of intellectual meetings were held, emphasizing in their totality the necessity to empower the Arab child to enter the era of the FIR, in accordance with a clear vision to invest in this huge technological revolution for the service and welfare of human beings and for developing the future in all respects, as well as to achieve the Sustainable Development Goals (SDGs).

In June 2019, HRH Prince Abdulaziz bin Talal bin Abdulaziz launched the Second Cycle of the Prize entitled: "The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution" to explore and discuss a number of concepts and the cognitive and scientific components of this new industrial revolution, in the light of an interconnected, integrated, conceptual structure. This is in accordance with a new intellectual layout that establishes an organic relationship between the child and the FIR, within the framework of a global awareness, under the slogan of 'A New Mind, for a New Human, in a New Society'.

An open dialogue around citizenship and upbringing during the Awards Ceremony of the Prize's First Cycle.

The Prize, in its Second Cycle, is considered a primary component of a Project that includes another component to prepare an Arab Study on children's readiness for the era of the FIR. It will also represent the orientation of ACCD's next Strategic Plan until 2025.

King Abdulaziz Prize for Scientific Researches on Childhood and Development is an initiative founded by the late HRH Prince Talal bin Abdulaziz, the Founder of ACCD. It is now sponsored by HRH Prince Abdulaziz bin Talal bin Abdulaziz, ACCD President, to reflect HRH's belief in supporting and enhancing the intellectual and strategic orientation of ACCD in accordance with the international charters and conventions on the rights of the child and the 2030 SDGs with support from AGFUND, the strategic partner.

The Second Cycle of the Prize
The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution

The Prize Justifications:

- Keeping up with global development with the emergence of the expression 'the Fourth Industrial Revolution', which enforces upon us to prepare our children for it with all its opportunities and risks. The industrial revolution is inevitably coming and we should deal with it as a technological inevitability that cannot be avoided.

- Ensuring that the child possesses the future tools through enhancing their research, critical, and analytical skills to maintain a balance in the child's personality.

- The child's values and capabilities to be developed must be reformulated as we renew the child's mind to face a new society and world. We must understand how the child is prepared and in what form.

- There is a need to enrich scientific research in the domain of childhood in the Arab region to respond to the requirements of the FIR for the sake of developing the children's capabilities, increasing their participation opportunities, and empowering them with the skills of the 21st century.

The Prize Objectives:

- Publishing and awareness raising around the importance of empowering the Arab child in the era of the FIR with its opportunities and risks, in the light of an integrated, interconnected conceptual structure, and consistent with a new intellectual framework that establishes an organic relationship between the child and the FIR within a global awareness perspective.
- Deepening ideas and crystalizing new ones that empower the Arab child to acquire the variables of the surrounding scientific and technological revolution.
- Enabling child upbringing means and media to benefit from the results of this scientific and technological revolution, and to deal with its impact on society, human beings, and education.
- Developing the ACCD's Model of Upbringing within the framework of the scientific and technological revolution.

Targeted Researches:

The benefits from these researches will be achieved through making available an applied knowledge structure that assists decision makers and upbringing institutions in the Arab countries to set visions and mechanisms for empowering the Arab child to deal with the requirements of the FIR, as a global awareness revolution. Thus, the Prize targets:

- Applied researches around merging the technologies of the FIR in society and educational materials to help the child enjoy life and become more enlightened.
- Applied researches around the best utilization of information and communication technology (ICT) and modern social media so as to allow the flow of knowledge for the learner anywhere and from all knowledge producing centers in the world.
- Applied researches around the enabling environments (family – school - media – civil society).

> **The Prize Committee decided to add another axis to this Cycle concerned with the COVID-19 repercussions and the need to empower our Arab countries to use the advanced technology related to the FIR.**

Dates and Figures of the Second Cycle

- **Eight researchers from two Arab countries have won prizes.**

- **The total value of the prizes is 11,000 US dollars.**

- **The conditions and regulations of the Prize were announced in January 2020.**

- **The submission deadline was closed in September 2020.**

- **Winners were announced in June 2021.**

The Prize renews the issues tackled by its cycles in accordance with the orientation of ACCD, and the Arab and global events that face the children. The Prize seeks to stimulate scientific research and the production of knowledge to establish a pedagogic, enlightened, intellectual current that builds supporting policies and enabling environments for raising Arab children with new minds to become new human beings in new societies where the Arab citizen enjoys the enlightenment of knowledge, intellect, freedom and justice. In general, the Prize aims to maximize social dialogue around issues that are important for the child and his upbringing through research.

<p style="text-align:center;">**The Winning Researches in the Second Cycle**</p>

First Prize:

Research Title: "The Proposed Priorities for Rapid Intervention to Empower the Arab Child to Meet the Requirements of the Fourth Industrial Revolution…A Road Map" Submitted from Saudi Arabia. The following are the contributors to the research:

- **Prof. Nouf Naser Al-Tamimi:**

  Professor of Foundations of Education – Faculty of Education - Prince Sattam bin Abdulaziz University.

- **Dr. Mohamed Shawki Abdulfattah Shaltout:**

  Associate Professor of Education Technology - King Abdulaziz & His Companions Foundation for Giftedness and Creativity.

- **Dr. Fatma Abdullah Mohamed Al-Agla:**

  Assistant Professor of Early Childhood - Faculty of Education - King Saud University.

- **Dr. Sarah Omar Al-Sabti Abdulkarim:**

  Assistant Professor of Early Childhood - Faculty of Education - King Saud University.

Second Prize:

Research Title : «TAWASOL» '*Communication*': A Program to Assist the Deaf and Dumb to Communicate Easily Using Arabic and English Languages through Transforming Sign Language to Audible Sound and Sound to Legible Text"; Submitted from Egypt. The following have contributed to the research:

Ahmed Tareq Dahrug

• **Dr. Ahmed Tareq Dahrug:**

Lecturer – College of Computing & Information Technology - Arab Academy for Science Technology and Maritime Transportation.

• **Eng. Mohamed Adel Abdo Abdulazeem**

Computer Science Specialist - College of Computing & Information Technology - Arab Academy for Science Technology and Maritime Trans portation.

Mohamed Adel Abdo Abdulazeem

The Incentive Award:

Research Title: Personal Assistant for Autistic Children, AutChi Application with Smart Glasses" submitted from Egypt. The following have contributed to the research:

• **Eng. Mennatallah Maged Mostafa Kamel:**

Assistant Lecturer - College of Computing & Information Technology - Arab Academy for Science Technology and Maritime Transportation.

Mennatallah Maged Mostafa Kamel

• **Eng. Mohamed Essam Abdulsalam:**

Assistant Lecturer - College of Computing & Information Technology - Arab Academy for Science, Technology and Maritime Transportation.

Mohamed Essam Abdulsalam

The Prize Scientific & Organizational Committees

Secretary General of the Prize:

- **Prof. Hassan Al-Bilawi**   ACCD Secretary General

Chair of the Scientific Committee:

- **Prof. Yousri Al-Gamal**   Former Minister of Education, Egypt

Prize Coordinator:

- **Eng. Mohamed Reda Fawzi**   Director of the Department of Research, Documentation and Knowledge Development, ACCD

Members of the Scientific Committee (in Alphabetical Order)

- **Dr. Abdallah Omara**   Researcher in the Department of Research Documentation and Knowledge Development - ACCD

- **Prof. Ahmed Ouzi**   Honorary Professor - Faculty of Education, Mohammed V University - Morocco

- **Dr. Gevara Al-Behairi**   Expert in Artificial Intelligence, Egypt

- **Dr. Hani Torki**   Director of the Arab Knowledge Project, UNDP, UAE

- **Mr. Kamal Al-Falaki**   Acting Director of the Developmental Projects Department – ACCD

- **Prof. Mahmoud Nessim**   (The late) Professor of Art Philosophy - Arts Academy - Egypt

- **Prof. Mohamed Aborizka**   Dean of the College of Computing & Information Technology Arab Academy for Science, Technology and Maritime Transportation of Computer Science - Egypt

- **Dr. Mohamed Meqdadi**   Secretary General of the National Council for Family Affairs - Jordan

- **Dr. Nabil Samuel**   Expert in Social Development - Egypt

ACCD Technical & Organizational Committee for the Prize

- **Eng. Mohamed Reda Fawzi**   Director of the Department of Research, Documentation and Knowledge Development, ACCD (Committee Chair)
- **Ms. Eman Bahieldin**   Director of the Childhood Media Department
- **Ms. Marwa Hashem**   Coordinator of Childhood Media Department
- **Dr. Abdallah Omara**   Researcher in the Department of Research Documentation and Knowledge Development
- **Mr. Mohamed Amin**   Specialist of Printing and Publishing
- **Ms. Eman Abbas**   Technical Assistant, Department of Research, Documentation, and Knowledge Development

Research Abstracts

The First Prize

The Proposed Priorities for Rapid Intervention to Empower the Arab Child to Meet the Requirements of the Fourth Industrial Revolution.. A Road Map (From Saudi Arabia)

Prof. Nouf Naser Al-Tamimi

Dr. Fatma Abdullah Mohamed Al-Agla

Dr. Mohamed Shawki Abdulfattah Shaltout

Dr. Sarah Omar Al-Sabti Abdulkarim

This study aims to present a proposed roadmap of a prioritized rapid intervention that will empower the Arab child and prepare him for the FIR. To achieve this, the researchers implemented a qualitative study by analyzing (27) international documents from over seven of the world's most prominent councils, institutions and organizations affiliated with children's education to determine current trends in child empowerment for the FIR. Moreover, the researchers reviewed leading global initiatives and experiences in the field, and analyzed approximately (16) global initiatives to determine best practices in the field. Furthermore, field work included the researchers holding a discussion panel of (14) academic experts in education from three Arab universities (from Saudi Arabia, Egypt, and Jordan), as well as conducting two focus groups for experts and education practitioners from the same three countries. The first group consisted of five experts who hold Master's degrees; the second group consisted of seven computer science teachers. The purpose of these groups was to gain insight into effective methods for rapid intervention strategies to successfully prepare the Arab child for the requirements of the FIR. This study was able to produce a proposed roadmap to empower the Arab child and prepare him for the requirements of the FIR. This included several rapid intervention priorities that can be adopted by different educational institutions and various incubators of initiatives for youth that have the responsibility of building and rehabilitating the human work force. The effort to build their skills for the present and future work fields, develop programs that adapt to these transformations with tools that are cutting edge and adaptive to the rapid changes, will better empower the Arab child for the FIR so as to enable him to compete at the national, Arab, and international level.

The Second Prize

«TAWASOL»

(From Egypt)

Dr. Ahmed Tareq Dahrug
Eng. Mohamed Adel Abdo Abdulazeem

A large group of children in the Arab world suffer from the disability of being deaf and dumb for various reasons, including genetic causes, accidents and other factors that the child is exposed to at an early stage of his life. Like the rest of our children, this group has rights that must be met in our Arab society..

The first right is to integrate these children into the society to be treated like other children without discrimination or infringement on their rights. There were many means provided by the world to serve this group, help them to overcome obstacles, and facilitate their lives as much as possible.

Sign language is at the forefront of these means. It is considered one of the oldest means of communication for the deaf and dumb, appearing in Spain in the 17th century to deal with those who do not have the ability to speak and hear. It is considered one of the languages in which the hands are used for specific signs, which are according to each letter of the alphabet through which sentences can be formed.

Sign language is not only limited to the movement of the hands. It includes facial expressions, lip movement, and body movement expressions. There is no doubt that the use of sign language has greatly contributed to improving the lives of the deaf and dumb, and enabled them to communicate with the world around them and overcome many obstacles.

But we need to ask ourselves, how do you estimate the percentage of people who can understand and speak sign language? We find that it is almost impossible to find a person who understands sign language, except in special circumstances, such as the presence of one of his relatives or persons acquainted with the deaf and mute, or working conditions such as in a home for people with special needs. Certainly, governments and some NGOs interested in the affairs of the deaf and dumb group tried to spread awareness campaigns for all spectrums of peoples to enable them to learn sign language and make them aware of the importance of learning it, but the success of these campaigns was in a limited range.

Therefore, from the standpoint of social responsibility towards children with disabilities, it was necessary for us to find an alternative solution that helps this group of people with special needs to enable them to communicate with the outside world without obstacles or difficulties. In view of the tremendous technological progress our world is experiencing at the present time, modern technology is the most important weapon we possess to solve this problem through a communication project.

Tawasol project aims to provide a solution to the problem of the deaf and dumb and break the barrier that prevents them from communicating naturally with the outside world, using modern technology such as machine learning, artificial intelligence and smart phones equipped with high-quality cameras. Tawasol project is divided into two main parts. The first section, which is devoted to helping the deaf, by converting the speech heard from the speaking person into written speech on the smartphone screen, so that the deaf person can communicate with the speaking person easily. And the second section, which is dedicated to helping the dumb, by converting sign language from the camera to written text and then into audible speech, so that the dumb person can easily communicate with the outside world without the need for the person speaking to him to be familiar with and aware of sign language.

The Incentive Award

Personal Assistant for Autistic Children, AutChi Application with Smart Glasses (From Egypt)

Eng. Mennatallah Maged Mostafa Kamel
Eng. Mohamed Essam Abdulsalam

The world is going through a new developmental period when digital technology, physical technology, and biological technology have successively achieved unprecedented development in their respective fields, and at the same time their applications are converging greatly. These are the three major technological factors of the FIR. There have been three major technological developments so far. Beginning in Great Britain, the First Industrial Revolution was the hydraulic and steam machines that were introduced in factories. The Second Industrial Revolution brought about the separation of ingredients and the assembly of products based on the division of labor. It has taken people into the era of mass-producible consumer products. The Third Industrial Revolution was characterized by a wide application of electronic and informatics technology and the continuous automation of the manufacturing process.

Now the world is facing its first stages with regard to the FIR, which is called the digital revolution and its most important features are: 3D printing, the internet of things, main color analysis, cloud computing, competition between man and machines and other general manifestations that appeared and others that did not.

And if the industrial revolution had brought these huge different, and magnificent changes to the whole world, then the changes that the FIR has brought, and the one expected to blow our minds and go beyond our imaginations is much closer to fantasies. So, we could call it the revolution of transforming fantasy into reality. Who would have imagined that a robot could compete with humans for job opportunities, replace them, and beat them in some jobs. Who would have imagined seeing a driverless car traveling on the road and even buildings created by 3D printing, or surgical

procedures performed by a robot, or digital currencies that are dealt with, although they do not exist except in virtual reality, and many others.

Although we look at some successes or results of the FIR, so far, as being closer to miracles or science fiction, the future holds a lot, and future developments may be much greater than what we saw in the course of this revolution. What appears to us is perhaps several stages less than what is hidden or contemplated in scientific research centers in the developed world or in development institutions in these countries. This is due to the main reason that knowledge is increasing and accumulating in an unprecedented manner throughout history.

Knowing this FIR, we've decided to keep pace with this development and apply it in projects that benefit the Arab world and the world as a whole, so we started by addressing the problems that should be under the spotlight. We found that children with autism spectrum disorders do not get enough attention from Arab countries, although their numbers are not small and are constantly increasing. Autism is a developmental disorder characterized by difficulties in social interaction and communication, and restricted, repetitive behavior. In Egypt, people with autism are one and a half million and in every 46 children only one shows signs of this mental condition.

We started with the idea of a project that consisted of a smartphone app called AutChi and smart glasses, with the main objective of helping children with autism improve their social skills while using the app. The AutChi app contains many functions to interact with the real world throughout artificial intelligence technology, make friends with other colleagues of the same age, learn how to initiate, and keep conversations effective and continuous, learn to empathize with others, and help them meet their needs in a better manner. The child can also enjoy educational and entertaining games. By using smart glasses with application, the child can understand the feelings of the person in front of him, and the glasses work using a small computer called Raspberry pi, which is responsible for recognizing the face and then the feelings, using artificial intelligence and deep learning. The project also aims to help parents better understand and communicate with their children.
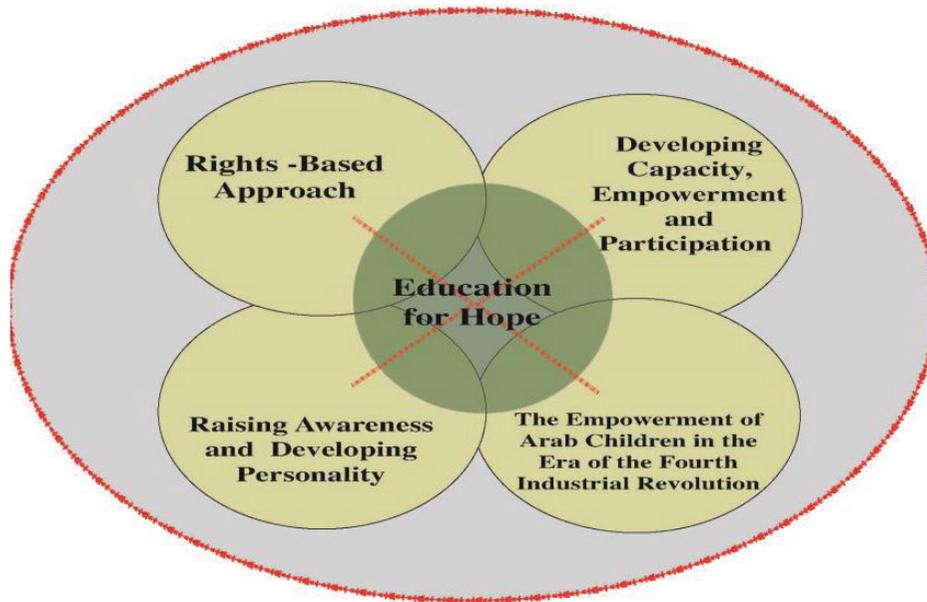
Thanks & Appreciation

The General Secretariat of ACCD has the honour to present its deepest thanks and gratitude to the patron of the Prize, HRH Prince Abdulaziz bin Talal bin Abdulaziz, ACCD President, and to AGFUND, the strategic partner, and to the members of the Scientific Committee of the Prize, experts, referees, and researchers. Thanks are also due to the ACCD's work team members who have contributed to the preparation and implementation of this Cycle.

For more information about the Prize:
www.arabccd.org

"Education for Hope"

ACCD Model for Arab Child Upbringing

Rights -Based Approach

Developing Capacity, Empowerment and Participation

Education for Hope

Raising Awareness and Developing Personality

The Empowerment of Arab Children in the Era of the Fourth Industrial Revolution

The Intellectual Framework of the Model

For more information on the Model and its Components:
www.arabccd.org