H2020 FRAMEWORK PROGRAMME
ICT-01-2014: Smart Cyber-Physical Systems

PROJECT NUMBER: 645496

Agile, eXtensible, fast I/O Module for the cyber-physical era

D2.4 – Final Report on AXIOM Events

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PU	Public
PP	Restricted to other programs participant (including the Commission Services)
RE	Restricted to a group specified by the consortium (including the Commission Services)
CO	Confidential, only for members of the consortium (including the Commission Services)

Change Control

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1.0	10.01.2018	Maurizio Caporali, Laura Gales	UNISI	First Draft
1.1	30.01.2018	Maurizio Caporali, Laura Gales	UNISI	Second Draft
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Release Approval

Name	Role	Date
Maurizio Caporali	WP-leader	03.01.2018
Roberto Giorgi	Coordinator	14.02.2018

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GLOSSARY

H2020 Horizon 2020 Framework Programme

WP Work Package

CPS Cyber-physical system

DoA Description of Action (acronym set by the European Commission)

HPC High Performance Computing

Executive summary

This document is the final report on the dissemination of the AXIOM Project, reporting the events and associated activities undertaken by the AXIOM Project and partners of the Consortium. The date range covered by this document is the 1st February 2017 to 31st January 2017 and covers events held after the D2.2 Report on AXIOM Events.

To enhance dissemination, addressed by the Consortium we targeted the following three key fields: the industrial area, the Maker community and the scientific community.

1 Introduction

This deliverable describes the efforts put into place by the AXIOM Project for what regards events.

The tasks accomplished by the AXIOM Project to make these events happen have been:

- Research;
- Paper Publications;
- Attending major conferences in regard to HPC and cyber-physical systems;
- Presentation of such papers at some of these conferences;
- Preparing dissemination material to expose for events in the maker / embedded / industrial open-source field;
- Preparing presentation and workshop for such events.

1.1 Document structure

The document is structured this way:

1. Glossary, Executive Summary and Introduction
2. Dissemination Strategy of Events
    - Scientific Events
    - Industrial Events
    - Open-source and Maker Community

For each event, we have drawn up a dedicated report, which includes quantifiable metrics on the event.

1.2 Relation to other deliverables

Our activity as WP2 is to disseminate the activities performed in other WPs.

1.3 Tasks involved in this deliverable

This deliverable is the result of the work developed in task:

- Task 2.1 (month 1-36): Dissemination strategy, planning and actions.

2 Dissemination Strategy of Events

The following section aims at being a data-driven report of the events in which the AXIOM Project has been disseminated.

For each event, we have done a dedicated report, which includes metrics on the event in order to quantify the outcome of our work, including information such as:

- the name of the event;
- the location of the event;
- the date of the event;
- a link to the event;
- the main activity pursued by AXIOM at the event;
- the number of people attending the event if reported;
- the number of people that we've managed to engage at the event;
- the topic of the event;
- resources and dissemination activities put into place for the event.

For every event attended, we have followed a strategy that embraces social media, in addition to publishing on the AXIOM blog and blogs of our partners. While an event is taking place, we allocated resources to account our participation, taking photos and videos, promptly sharing the media on social platforms, increasing both the awareness of our presence and directing attendees to our presentation or booth.

The following report covers the dissemination activities we used to maximize the outcome of our participation in the last year.

2.1 List of Scientific Publications (papers)

For completeness, at the end of this report we highlight the list of scientific publications (papers) that have been realized thanks the support of the EU Commission funding of the AXIOM project (id. 645496) [1]-[29].

2.2 Scientific Events

Speaking of the academic domain, from the beginning of the AXIOM project the team has participated in 21 conferences. The AXIOM Project consortium and its members have given 38 presentations since the start of the project. All of them are available on D2.2 for the first two-years and in this deliverable for the final year, and also on the AXIOM website at the following address: http://www.axiom-project.eu/presentations/

We have attended 20 workshops, organized 2 workshops, presented 8 posters and produced 3 model of flyer. Brochures, posters and business cards have been distributed at over 25 events.

The list of scientific events organized or attended by members of the AXIOM Project are as follows, ordered from the most recent attended to the least recent.

2.2.1 HiPEAC 2018 (with final workshop)

Name of the event: HiPEAC 2018 (with final workshop).

Location of the event: Manchester, United Kingdom

Date of the event: January, 22-24, 2018

Link to the event:

https://www.hipeac.net/2018/manchester/
https://www.hipeac.net/events/activities/7538/ship-cps/

Main activity: AXIOM has been one of the main sponsors of event. Provided a workshop "SHiP-CPS: Software/Hardware platforms for Cyber-Physical Systems", chaired by Roberto Giorgi and covering the main challenges in order to build effective CPS hardware/software platforms - Programmability, Parallelism, Interconnects, Real-Time, Evaluation toolchain. The workshop had sign-ups from 34 institutions across 13 countries. AXIOM was among twenty companies that had booths in the coffee break area, where we presented the accomplishments of the project to experts in computer architecture, programming models, compilers and operating systems. Over a hundred leaflets were collected by event attendees.

People attending the event: 600

People engaged at the event: 50 workshop and 60 at booth.

Topic of the event: computer architecture, programming models, compilers and operating systems for embedded and general-purpose systems.

Resources and dissemination activities:

Blog:

http://www.axiom-project.eu/2018/01/hipeac-2018-technical-forum-and-workshop/

Video:

https://twitter.com/axiom_project/status/956159293455306752

https://www.facebook.com/theaxiomproject/videos/828088604041323/

Twitter:

https://twitter.com/axiom_project/status/953947671605202944

https://twitter.com/hipeac/status/955700376954552320

https://twitter.com/axiom_project/status/955797924901982208

https://twitter.com/axiom_project/status/955819106539835393

https://twitter.com/axiom_project/status/956171864413495296

https://twitter.com/hipeac/status/956217489909866497

Facebook:

https://www.facebook.com/events/536605890043209/

https://www.facebook.com/theaxiomproject/posts/827590860757764

https://www.facebook.com/theaxiomproject/posts/827623337421183

https://www.facebook.com/theaxiomproject/posts/828127154037468

2.2.2 Industrial and real-time applications on multi / many-core heterogeneous devices

Name of the event: Industrial and real-time applications on multi / multi-core heterogeneous devices.

Location of the event: Bologna, Italy

Date of the event: October 18, 2017.

Link to the event:
http://www.crit-research.it/it/eventi/applicazioni-industriali-real-time-dispositivi-eterogenei-multi-many-core/

Main activity: SECO and Evidence provided a joint presentation, covering the AXIOM Project, and a demo with trace measurement and power management using ERIKA3 + Hypervisor JailHouse + Linux. The AXIOM board and the derivative created by SECO for their industrial market were displayed on a stand, with associated information materials.

Topic of the event: embedded industrial applications.

Resources and dissemination activities:

Twitter:

https://twitter.com/axiom_project/status/921298018967654402

https://twitter.com/axiom_project/status/921301659099320320

https://twitter.com/axiom_project/status/907915748525428736

Facebook:

https://www.facebook.com/theaxiomproject/posts/768278380022346

Figure 1. *Exhibitor stand with the AXIOM board and the SECO version adapted for their industrial market.*

2.2.3 PACT 2017

Name of the event: Parallel Architectures and Compilation Techniques (PACT).

Location of the event: Portland, Oregon, USA.

Date of the event: September 9-13, 2017.

Link to the event: https://parasol.tamu.edu/pact17/workshops-tutorials

Main activity: A workshop tutorial by Xavier Martorell of BSC that showed the OmpSs Programming Model. Based on both teaching and laboratory sessions.

Topic of the event: Introduction to OmpSs, OmpSs support for heterogeneous architectures, hands-on, FPGA support in OmpSs

Resources and dissemination activities:

Blog:

https://pm.bsc.es/blog/xteruel/heterogeneous-parallel-programming-ompss-pact-2017

2.2.4 Italian Workshop on Embedded Systems (IWES)

Name of the event: Italian Workshop on Embedded Systems (IWES)

Location of the event: Rome, Italy

Date of the event: September 7-8, 2017.

Link to the event: http://mclab.di.uniroma1.it/iwes2017/programme.phtml

Main activity: Presenting a workshop titled "The AXIOM-board: bringing programmability, acceleration, scalability into a 64-bit hand-size board".

Topic of the event: Exchange of research experience in academy and industry on all aspects of embedded systems.

Resources and dissemination activities:

Twitter:

https://twitter.com/axiom_project/status/909459730875248641

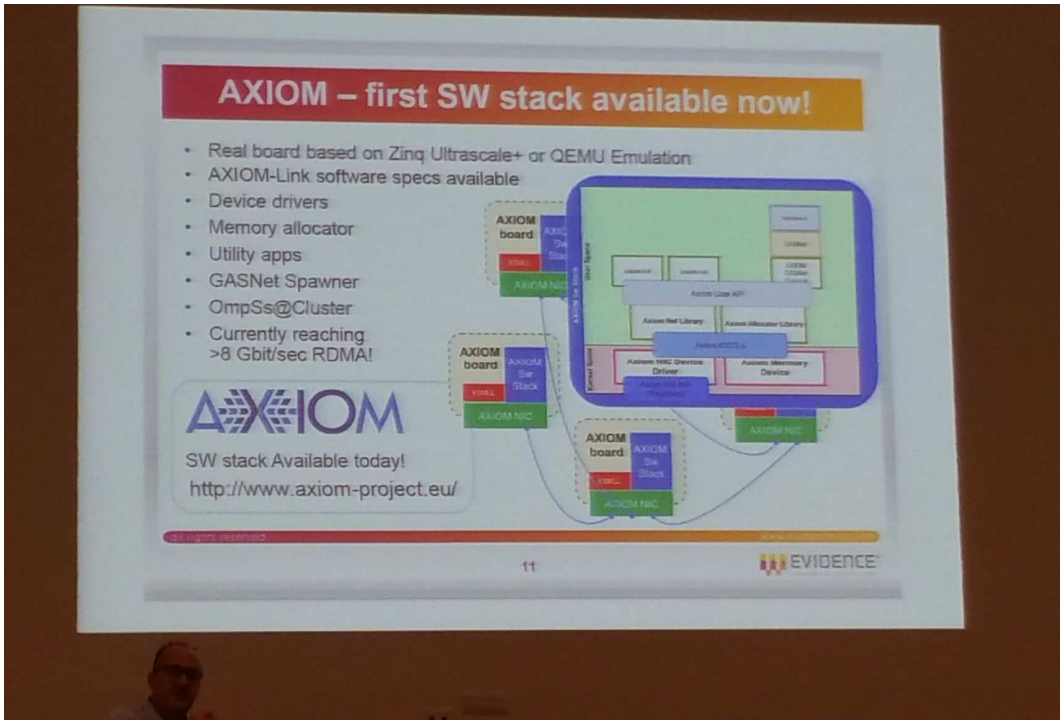

Figure 2. *Evidence at Italian Workshop on Embedded Systems IWES 2017*

2.2.5 MECO'2017

Name of the event: 6th Mediterranean Conference on Embedded Computing.

Location of the event: Bar, Montenegro.

Date of the event: June 11–15, 2017.

Link to the event: http://embeddedcomputing.me/en/meco-2017

Main activity: Keynote presentation held by Project Coordinator Roberto Giorgi.

People attending the event: around 200 participants.

People engaged at the event: around 50 people.

Topic of the event: software and hardware architectures for embedded systems, systems on chip (SoCs) and Multicore Systems, Communications, Networking and Connectivity.

Resources and dissemination activities:

Twitter:

https://twitter.com/DrErvinSejdic/status/874169877434695680

https://twitter.com/axiom_project/status/874279340682489856

Figure 3. *Photo taken by attendee Dr Ervin Sejdić, during MECO 2017 keynote presentation.*

2.2.6 Computing Frontiers 2017

Name of the event: ACM International Conference on Computing Frontiers 2017.

Location of the event: Siena, Italy.

Date of the event: May 15-17, 2017.

Link to the event: http://www.computingfrontiers.org/2017/

Main activity: Presentation by Davide Catani, and exhibitor stand supervised by Laura Gales. The AXIOM board was presented on the stand, alongside A4 leaflets and a pop-up display. At an evening networking event, Maurizio Caporali discussed the AXIOM project with various professionals.

People attending the event: 100.

People engaged at the event: 20 at stand.

Topic of the event: Algorithms and Models of Computing, Embedded and Cyber-Physical Systems, Big Data Analytics.

Resources and dissemination activities:

Blog post:

http://www.axiom-project.eu/2017/06/axiom-at-computing-frontiers-2017/

Twitter:

https://twitter.com/axiom_project/status/864053866345758720

Figure 4. *Exhibitor stand with a production AXIOM board.*

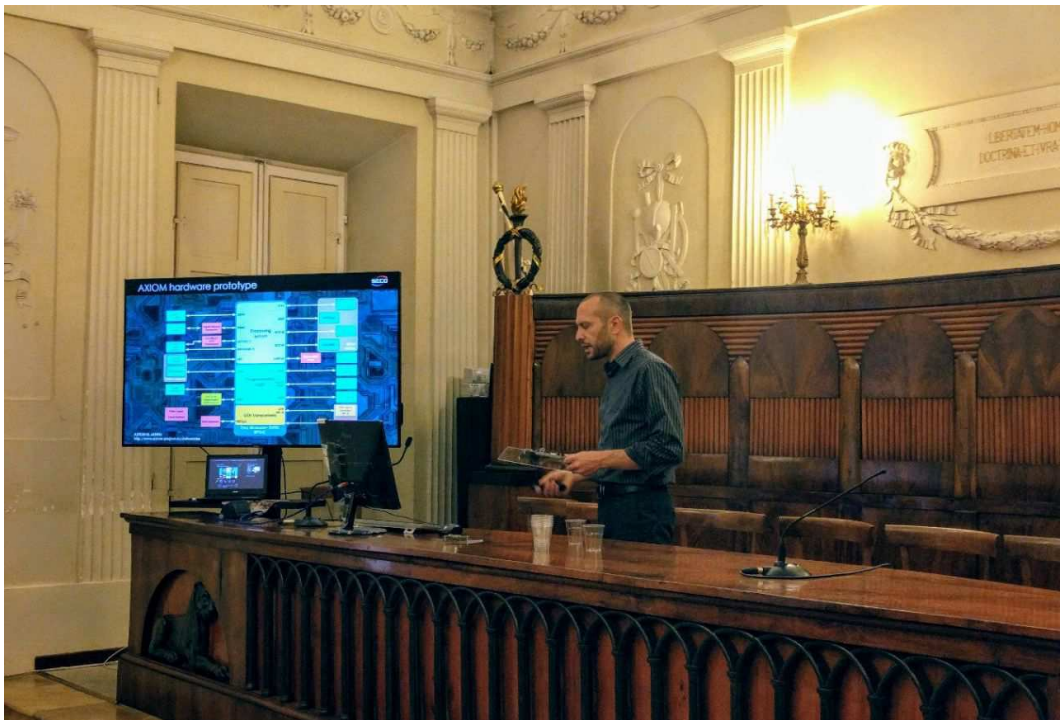

Figure 5. *Presentation by Davide Catani, titled "AXIOM project: from applied research towards embedded systems".*

2.2.7 Smart Cyber-Physical Systems – Concertation Event

Name of the event: Smart Cyber-Physical Systems – Concertation Event.

Location of the event: Brussels, Belgium.

Date of the event: January 30, 2017.

Link to the event: http://road2cps.eu/events/?p=1063

Main activity: In a session titled "CPS Research and Innovation Actions 2104", Paolo Gai of Evidence presented an introduction to the AXIOM Project.

Topic of the event: Presenting findings of the Road2CPS and TAMS4CPS projects.

Resources and dissemination activities:

Blog post:

http://www.axiom-project.eu/2017/01/axiom-will-be-presented-at-smartcps/

Twitter:

https://twitter.com/axiom_project/status/818758850165833729

2.3 Industrial Events

Industrial events spread awareness of the projects' achievements amongst influential companies and individuals who shape the high performance and embedded computing sector.

The AXIOM team participated in Embedded World 2017, showcasing the project from within assigned space at the SECO Lab/UDOO booth. For the future, we have set the date to present both the project and the final system at Embedded World 2018.

Consortium member Evidence participated in the Embedded Linux Conference 2017, disseminating material about the AXIOM project from their stand located within the ARM section.

2.3.1 Embedded World 2018 [future planned event]

Name of the event: Embedded World 2018.

Location of the event: Nuremberg, Germany.

Date of the event: February 27– March 01, 2018.

Link to the event: https://www.embedded-world.de/

Main activity: - This report concluded before this event took place.

AXIOM has been allocated space in the SECO Lab booth. A demo with hypervisor setup is planned to be shown at the Lauterbach booth featuring the AXIOM board (presented in section 2.1.2 of D2.3).

People attending the event: 30,000 expected

People engaged at the event: N/A

Topic of the event: Security for electronic systems, Distributed intelligence, Internet of Things.

Resources and dissemination activities: [future activity]

2.3.2 Embedded Linux Conference

Name of the event: Embedded Linux Conference

Location of the event: Prague, Czech Republic

Date of the event: October 23-25 2017.

Link to the event: http://events.linuxfoundation.org/events/embedded-linux-conference-europe

Main activity: Exhibition stand of Evidence where they presented the AXIOM board.

Topic of the event: Embedded linux

Resources and dissemination activities:

Twitter:

https://twitter.com/axiom_project/status/919876610815397894

https://twitter.com/primeurmagazine/status/922403596788027392

https://twitter.com/axiom_project/status/922399442250207237

Figure 6. *Evidence presenting the AXIOM board on the ARM booth.*

2.3.3 IFSEC 2017

Name of the event: IFSEC 2017.

Location of the event: ExCeL, London, United Kingdom.

Date of the event: June 20–22, 2017.

Link to the event: https://www.ifsec.events/international/

Main activity: Exhibition booth by project partner Herta, demonstrating their facial recognition algorithms that are accelerated by the AXIOM board. Flyers related to the AXIOM project were distributed during the activity.

People attending the event: 27.658 security professionals.

Topic of the event: security technology, asset protection, security professionals' networking.

Resources and dissemination activities:

Twitter:

https://twitter.com/axiom_project/status/881858128043704321

Figure 7. *Herta Security explaining AXIOM with flyer at IFSEC 2017.*

2.3.4 ISC West 2017 Security Trade Show

Name of the event: ISC West 2017

Location of the event: Las Vegas, USA

Date of the event: April 5-7 2017.

Link to the event: http://www.iscwest.com/

Main activity: Exhibition stand of Herta Security demonstrating their facial recognition algorithms that are accelerated by the AXIOM board. Flyers related to the AXIOM project were distributed during the activity.

Topic of the event: security technology, asset protection, security professionals' networking.

Figure 8. *Herta Security at the ISC West 2017 with the AXIOM Poster.*

2.3.5 Embedded World 2017

Name of the event: Embedded World 2017.

Location of the event: Nuremberg, Germany.

Date of the event: March 14–17, 2017.

Link to the event: https://www.embedded-world.de/

Main activity: Multiple exhibition booths showing the AXIOM board (SECO & Evidence booths). Interviews with potential partners, for example ARM, SciLab Enterprises. A talk session by UDOO titled "Internet of Things - Machine Learning & Sensor Fusion" that contained references to the AXIOM Project.

People attending the event: 30,017.

People engaged at the event: around 160

Topic of the event: Security for electronic systems, Distributed intelligence, Internet of Things.

Resources and dissemination activities:

Blog post:

http://www.axiom-project.eu/2017/03/axiom-at-the-embedded-world-2017/

Video Interviews:

Davide Catani of SECO,: https://www.facebook.com/theaxiomproject/videos/677589065757945/

Paolo Gai of Evidence: https://www.facebook.com/theaxiomproject/videos/677345389115646/

Twitter:

https://twitter.com/axiom_project/status/842310136941154306

https://twitter.com/axiom_project/status/841941941570936833

https://twitter.com/axiom_project/status/841692145811628032

https://twitter.com/axiom_project/status/841612319830495234

https://twitter.com/axiom_project/status/841612268035035137

https://twitter.com/hipeac/status/841986310403420161

Facebook:

https://www.facebook.com/theaxiomproject/posts/682125868637598

https://www.facebook.com/theaxiomproject/videos/677589065757945/

https://www.facebook.com/theaxiomproject/videos/677345389115646/

https://www.facebook.com/theaxiomproject/posts/677345549115630

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/677344662449052/

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/677343492449169/

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/676764029173782/

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/676442345872617/

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/676413902542128/

https://www.facebook.com/theaxiomproject/photos/a.456576474525873.1073741829.372518552931666/676409282542590/

https://www.facebook.com/theaxiomproject/videos/676289545887897/

https://www.facebook.com/theaxiomproject/posts/673566136160238

Figure 9. *Photo of Maurizio Caporali (left) alongside stand visitors from ARM Education.*

2.4 Open-Source and Maker Community Events

Open-source and Maker events are accessible to members of the public and present an environment rich in resourcefulness, creativity and invention. The AXIOM team participates in these events as they provide an opportunity to engage with future operators and benefactors of high-performance computing systems such as the AXIOM board.

2.4.1 Maker Faire Rome 2017

Name of the event: Maker Faire Rome 2017

Location of the event: Fiera di Roma, Rome.

Date of the event: December 1-3, 2017.

Link to the event: http://www.makerfairerome.eu/en/

Main activities: Demonstrations and interviews from Evidence, Vimar and BSC. Exhibition of the AXIOM demos, posters, flyers and dissemination materials at SECO/UDOO's booth. We have distributed about 400 flyers during the three-days of the event. Also, there were three demos of AXIOM: one consisted in OmpSs, the programming model by Barcelona Supercomputing Center and supported by AXIOM, running on a cluster of UDOO X86 (produced by SECO) to optimize performance. One consisted of a cluster of AXIOM modules, demonstration the low power high performance capability, and the other demo consisted of an iris recognition security access system created by Vimar, running on a production AXIOM module (manufactured by SECO). All members of the consortium have contributed to the realization of such demos.

People attending the event: 120,000.

People engaged at the event: around 300.

Topic of the event: Maker Movement, DIY electronics.

Resources and dissemination activities:

Blog post:

http://www.axiom-project.eu/2017/11/axiom-at-maker-fair-rome-2017/

Video interviews:

Paolo Gai of Evidence: https://www.facebook.com/theaxiomproject/videos/802795986570585/

Nicola Bettin of Vimar: https://www.facebook.com/theaxiomproject/videos/802865023230348/

Xavier Martorell of BSC: https://www.facebook.com/theaxiomproject/videos/803258879857629/

Twitter:

https://twitter.com/UDOO_Board/status/932634645082099712

https://twitter.com/hipeac/status/932665344333832192

https://twitter.com/UDOO_Board/status/934013690533294080

https://twitter.com/axiom_project/status/936521738992734209

https://twitter.com/axiom_project/status/936590466111475712

https://twitter.com/axiom_project/status/936597046554972161

https://twitter.com/axiom_project/status/936611150795563010

https://twitter.com/axiom_project/status/936928698221043712

https://twitter.com/BSC_CNS/status/936941568841408512

https://twitter.com/axiom_project/status/936956058332999680

https://twitter.com/hipeac/status/937573437769359360

Facebook:

https://www.facebook.com/theaxiomproject/posts/797859527064231

https://www.facebook.com/theaxiomproject/videos/802795986570585/

https://www.facebook.com/theaxiomproject/videos/802865023230348/

https://www.facebook.com/theaxiomproject/photos/a.542586665924853.1073741830.372518552931666/803212799862237/?type=3

https://www.facebook.com/theaxiomproject/videos/803258879857629/

https://www.facebook.com/theaxiomproject/posts/803262353190615

https://www.facebook.com/theaxiomproject/posts/803353156514868

Figure 10. *Paolo from Evidence explaining the AXIOM board to visitors.*

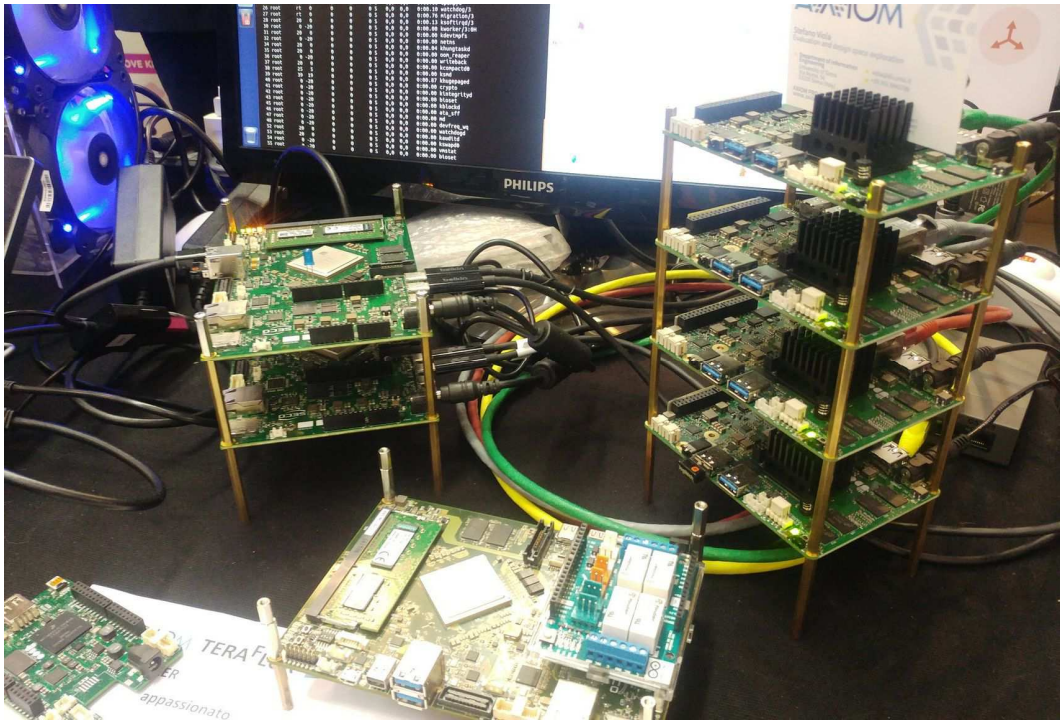

Figure 11. *A cluster of AXIOM boards and UDOO X86. Presented on the UDOO booth.*

2.4.2 Linux Open Day Pisa

Name of the event: Linux Open Day Pisa 2017

Location of the event: Pisa, Italy

Date of the event: October 28, 2017.

Link to the event: http://www.linuxdaypisa.it/

Main activities: Garzarella Stefano from Evidence presented the project to members of the public.

Topic of the event: STEM, Education.

2.4.3 Bright Toscana

Name of the event: Bright Toscana Siena 2017

Location of the event: Santa Chiara Lab

Date of the event: September 9, 2017.

Link to the event: http://www.bright-toscana.it/siena/

Main activities: Researchers from the AXIOM project demonstrating high performance cluster computing to members of the public.

People attending the event: 400.

People engaged at the event: 150.

Topic of the event: STEM, Education.

Resources and dissemination activities:

Twitter:

https://twitter.com/primeurmagazine/status/914558896177631233

https://twitter.com/axiom_project/status/914094603653042179

https://twitter.com/axiom_project/status/914094603653042179

https://twitter.com/axiom_project/status/913812797372411904

https://twitter.com/axiom_project/status/913812797372411904

https://twitter.com/axiom_project/status/913790328376881152

https://twitter.com/axiom_project/status/913786780217995275

https://twitter.com/axiom_project/status/912671436489285632

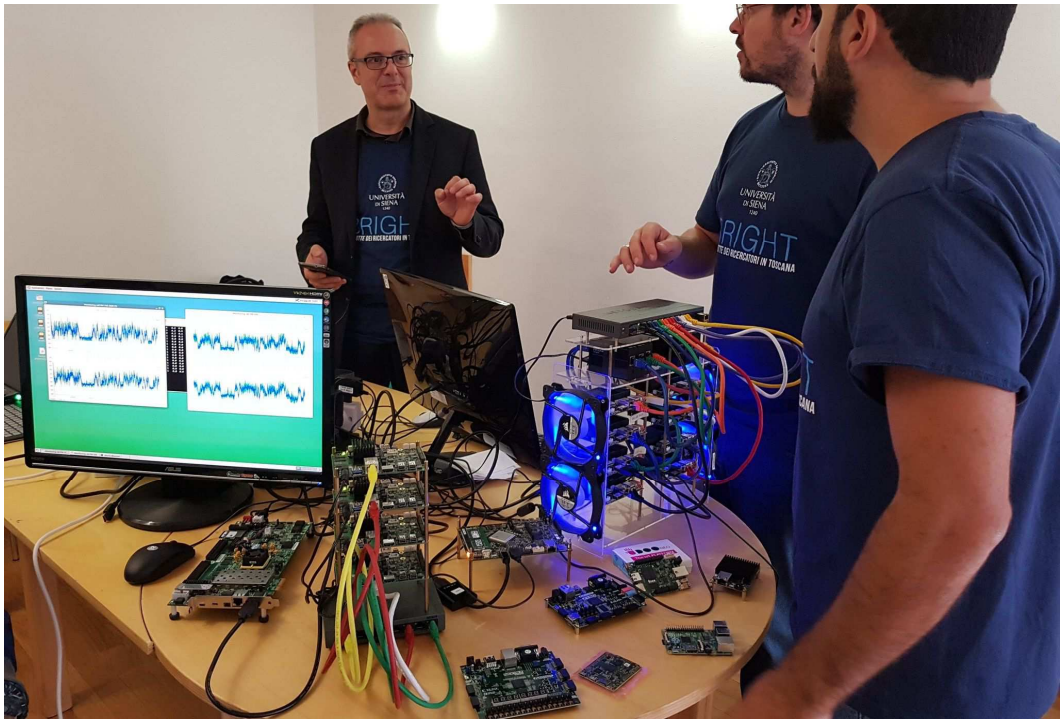

Figure 12. *The stand at the event with varied cluster configurations.*

Figure 13. *Visitors to the stand discussing high performance cluster computing.*

3 Confirmation of DoA objectives

Planned	**Delivered**
Organization of AXIOM Final conference	Such a workshop is presented in section 2.2.1
Exploitation of scientific networks of the partners.	As presented in section 2.1
Exploitation of business networks of the industrial partners.	As presented in section 2.3
Dissemination of the AXIOM Project in the open-source and maker community	As presented in section 2.4
Engage end-user communities	As presented in section 2.3 and 2.4

4 Conclusion

At the commencement of the AXIOM Project, the consortium set several principle aspects as defining factors of the dissemination strategy for events:

- information exchange between the members of the consortium;
- interoperability and complementarity with existing and upcoming research results;
- cross dissemination;
- organization of workshops;
- diffusion of knowledge;
- exploitation of the scientific and business networks to enhance the visibility of the project.

We conclude in this final report on dissemination activities that we have consistently fulfilled these objectives.

From the outset, consortium members have combined their knowledge of events and professional networks. Exploiting the various business and scientific networks of each member has facilitated the fulfilment of the dissemination objectives.

The AXIOM Project members have in fact taken an active place in the relevant conferences in the fields of HPC and CPS, and its members have been invited by exclusive, invitation-only events organized by HiPEAC. UNISI, FORTH and BSC have been fundamental to reach these results.

The industrial event Embedded World 2017 yielded multiple introductions to the key influencers of significant interest groups. They have or will disseminate the AXIOM project amongst their communities. It also exposed opportunities for exploitation that are presented in report D2.3.

We are preparing to attend Embedded World 2018, a fundamental event for the final dissemination of the project.

Furthermore, we have developed our involvement with open-source and maker communities. At Maker Faire Rome 2017, we doubled the demonstrations and range of board configurations on display compared to our previous attendances. The members of the consortium have participated in this annual event since 2015.

For the first time, the team demonstrated a cluster of AXIOM modules to members of the public. In the run-up to the event, we evaluated a range of real-world applications and selected an iris recognition demo established by VIMAR. It offered both a representation of how the AXIOM module will affect the lives of the general public and an opportunity for VIMAR to study the accuracy and public perception of the system.

This year also saw members of the team attend Bright Toscana, a public event that expresses the positive aspect of research activities and to disseminate a message of trust to the general public.

References

[1] R. Giorgi, "Accelerating Haskell on a Dataflow Architecture: a case study including Transactional Memory", Proc. Int.l Conf. on Computer Engineering and Applications (CEA), Dubai, UAE, Feb. 2015, pp. 91-100. ISBN: 978-1-61804-276-7

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