

Benchmarking of ICT Conferences in Croatia

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Abstract – The aim of this paper is to give statistical analysis of MIPRO history and perform conference benchmarking among ICT conferences in Croatia. The analysis involves comparisons of selected conference performance indicators between similar conference attributes. Using these benchmark indicators we want to position MIPRO conference on the obtained ICT conference benchmark.

I. INTRODUCTION

During last three decades a huge effort has been spent in Information and Telecommunication Technology (ICT) development. Especially in the last decade increased global attention is focused on the positive impact of ICT on economy and business performance. According to EU classification adopted in Croatia as National Classification of Economic Activities [1], the ICT sector includes the following activities:

- manufacture of computers, electronic devices, parts and accessories,
- whole sale trade in computers, office equipment, radio and TV sets,
- telecommunications,
- computer and related activities.

According to Croatian ICT Sector statistics ref [1] in late 2002 there were 1581 ICT companies in Croatia employing 22492 employees and further 7830 employed as IT staff in non ICT companies. The IT companies generated 7.8 billion HRK or 1.98% of the total national revenue and total revenue of Telecommunications business is 10.24 billion HRK. According to Croatian National Bank average annual exchange rate in 2002 for EUR was 7.41 HRK.

Due to forementioned reasons ICT and its development is of huge importance in global economy and country development. Furthermore, the global shift on the market from manufactured and material goods towards providing value added services makes information and knowledge assets indispensable. In information era the importance of knowledge and experience sharing among telecommunication industry (developers) and science (academy), as well as among service providers and end users is highly increased. Integration of communication between and within all levels, merging all activities of ICT sector, is necessity for future development.

Although new communication technologies have increased information flow and accessibility, the importance of conferences as communication tool has even increased. Conference is a place where people share

knowledge and experience, with educational and/or marketing character. Also, an important characteristic of conference is networking among people.

Therefore, conferences covering ICT topics are an important aspect of further ICT development. In this paper we performed benchmarking of ICT conferences held in Croatia. The main motivation was to explore trends and directions for ICT in Croatia through Croatian conferences. As well, we give a short historical statistics and position MIPRO conference on the Croatian ICT conference benchmark scale.

This paper comes on the occasion of MIPRO conference 30th anniversary as a milestone and a guideline for future. The first named author, who is precisely generation of MIPRO, is especially grateful for the opportunity to be involved in this joint paper along with the other two authors who have been around at MIPRO since its very beginnings/early days.

II. MIPRO OVER YEARS

Today, MIPRO convention is organized by Croatian Society for Information and Communication Technology, Electronics and Microelectronics, MIPRO HU. It assembles participants from academy, industry, providers and government. Traditionally, the convention organizes set of activities such as invited talks, plenary talks, round tables, seminars, sessions and traditional exhibition of ICT and electronic equipment, services and solutions. In the sequel we will give short history of MIPRO convention with special accent on ICT. All the data needed to write this historical overview of MIPRO were gained from the conference proceedings, annual reports, [2] and [3].

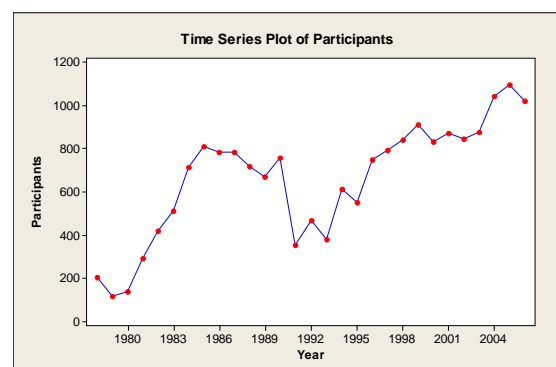


Figure 1. Number of participants over years (1978-2006)

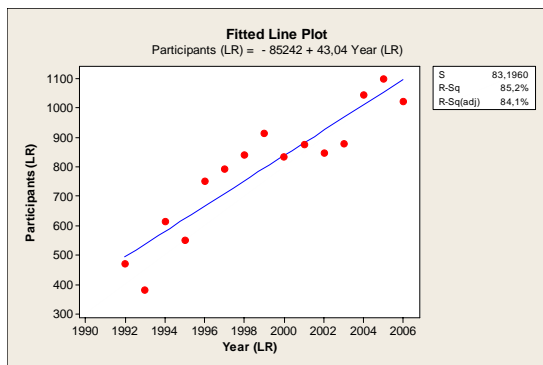


Figure 2. LRM for number of participants (1992 – 2006)

At its beginnings, MIPRO has been rapidly growing to 800 participants and kept that level until 1990, fig 1. During that period it has attracted also foreign participants. Since 1992 the number of participants was again already linearly growing as presented in Figure 2. The linear growth of number of participants over years is statistically significant and linear regression model (LRM) presented in Figure 2 fits the data extremely well. Using this model for prediction and assuming the same growth rates, expected number of participants this year is 1140 and in 2012 will be 1355 participants.

Behind the birth of MIPRO in 1977, lays the idea and need for inter-exchange of knowledge and practical experience in the field of applied microelectronics. Microprocessors were already applied in different industries and due to identified lack of knowledge in the field the idea of educational seminar was triggered from industry. The Society of Machine and Electrical Engineers and Technicians (Društvo strojarskih i elektrotehničkih inženjera i tehničara, DSEIT) has decided to organize seminar in the field of microprocessor systems and application of microprocessors. Already in 1978 the seminar named MIPRO, was attended by 204 participants. The seminar was held annually in Opatija ever since. Already next year the seminar has got wider context with participation of academic presenters and participants from all Yugoslavia.

In 1981 MIPRO had the first exhibition of information and electronics equipment. Such exhibitions have been an integral part of the MIPRO convention until today, as presented in Figure 3. Due to international and wide character of MIPRO, exhibitions are of great importance in communicating on international marketplace. Therefore, MIPRO serves as an excellent promotion of ICT in industry.

A very important role MIPRO has played in ICT development in Croatia through its official round tables. Round tables have been organized regularly mainly having hot topics bringing together service providers, equipment providers, government and academy, all having common goals but sometimes diverse interests. Lively discussions often opened a plenty of new issues to discuss but also led to successful problem clarification and conclusion. Among topics analyzed at round tables through years are challenges in development of ICT sector in Croatia, e-perspective of education, laws, security, influence of new EU directives on Croatian ICT sector, protection of intellectual property rights in ICT, new information technologies for special purposes etc.

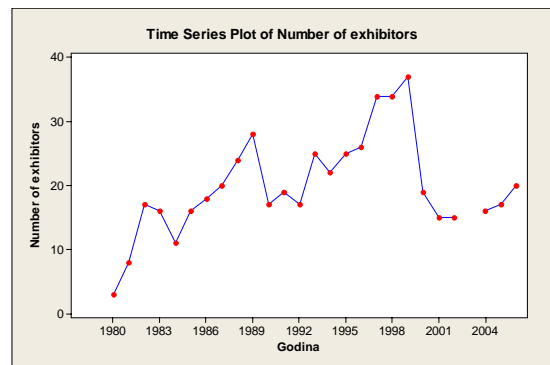


Figure 3. Number of exhibitors over years

In 1982 the first plenary talks and the first session on microprocessor systems were introduced. The session was divided into two groups named Process Management (Procesno upravljanje) and Microprocessing Systems in Telecommunications (Mikroprocesorski sustavi u telekomunikacijama). The ICT idea was present already since the first official session at MIPRO and participant's interest in that topic are responsible for observing MIPRO today as an ICT conference. Already next year, in 1983, because of great participant interest in telecommunication, the separate session is founded named Application of Microprocessors in Telecommunications. It attracted participants from academy, industry, research and development centers and telecom operators oriented to development of network and services. The invitation for MIPRO 1983 was sent in two languages, Croatian and English, which shows international character of the conference.

ICT idea within MIPRO has its 30 years tradition. ICT has always been the main focus of the conference, particularly within telecommunications session founded 25 years ago as one of the first official sessions at MIPRO. The key of this tradition lies in the fact that scope and goal of telecommunication session has been continuously adapted to evolving ICT consciousness of the conference participants. This is the main reason why the session has changed its name so frequently. However, it has always kept the initial ICT idea which has gradually evolved over years.

The telecommunication session experienced significant growth until 1988, as presented in Figure 4, when its name changed into Microcomputers in Telecommunication (MTE).

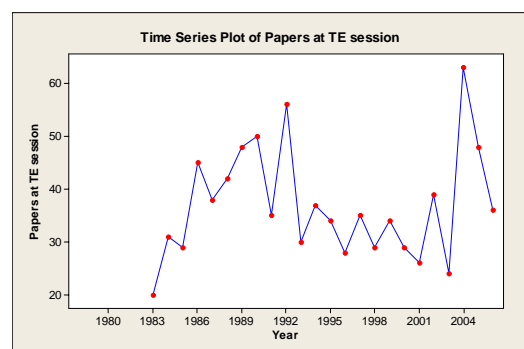


Figure 4. Number of papers published in conference proceedings of telecommunication session

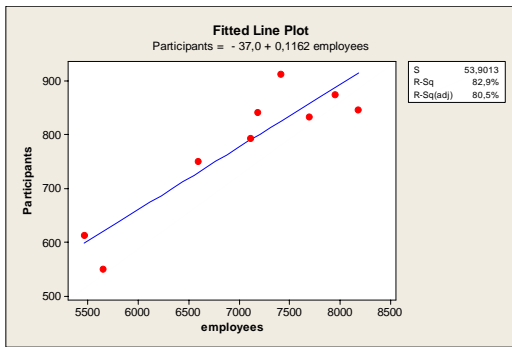


Figure 5. LRM for number of participants and number of employees in ICT sector

Within this session a new group of authors has emerged with main research interests related to information system development in telecommunications and telecommunication network management. Another change of goal and motivation of the session happened in 1996 when the name became Computers in Telecommunications (CTE). The present name, Telecommunications and Information (CTI), is the session name since 2004.

We analyzed the number of papers submitted, accepted and printed in telecommunication session part of the conference proceedings. From Figure 4 rapid growth of interest in telecommunication topics is visible. Early 1990s are a period of stagnation. The ICT sector began to recover in late 2002 as already stated in the Introduction. This reflected on greater interest in MIPRO conference during last years. New century is the beginning of a new era for ICT part of MIPRO.

When talking about interconnection of science and industry at MIPRO we have to stress that a joint work of academy and industry researchers gave a great contribution in promoting and developing ICT in Croatian science and researcher's community.

There is a strong correlation between employees in ICT sector and number of participants at MIPRO conference. Figure 5 shows how the interest in conference rose with amount of employees in ICT sector. The data for employee growth in ICT sector are obtained from [1].

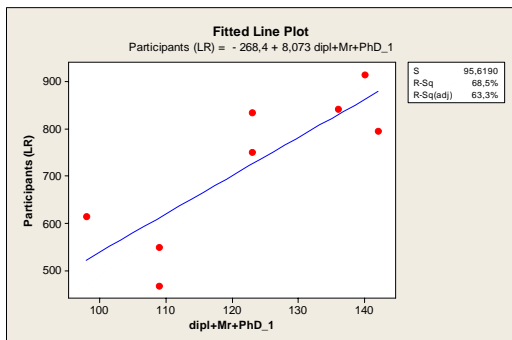


Figure 6. LRM between number of participants and number of graduations at Dept. of Telecommunications (FER)

Additionally, there is a strong correlation between number of graduated students, masters and doctors at Department of Telecommunications of Faculty of Electrical Engineering and Computing (FER), University

of Zagreb, and number of participants at MIPRO conference since 1992. The obtained fitted line plot is presented in Figure 6. The data source for graduation rate at Department of Telecommunications is [4].

We conclude this Section with the fact that, based on the model presented in Figure 2, interest for MIPRO conference is growing its importance for ICT development is very significant. Also, from Figures 5 and 6 a strong interaction between MIPRO conference and both, academy and industry, is evident.

III. ICT CONFERENCE BENCHMARK

A. Data Collection Plan

For benchmarking of ICT conferences in Croatia we prepared a detailed Data Collection Plan (DCP). The DCP document contains metric explanation used during data collection. All data were collected from the information available on the Internet. The conferences analyzed were selected randomly and cover majority of ICT conferences held in Croatia during 2005/06. The analyzed conferences are: MIPRO [5], KING ICT [6], Microsoft Windows [7], Microsoft Security Days [8], Croatian Society of Oracle Users (HrOUG) [9], Information and Intelligent Systems (IIS) [10], Information Technology Interfaces (ITI) [11], International Conference on Software Telecommunications and Computer Networks (SoftCom) [12], Conference on Telecommunications (ConTel) [13], Carnet Users Conference (CUC) [14], EastEuro Link [15], Business Process Conference (BPC) [16], Croatian Linux Users Conference (DORS/CLUC) [17] and Case [18] conference.

DCP document is presented in Table 1. The first column determines the question answered with measured data. In the second column we give names of measured variables and the same naming convention was used across this paper. The third column gives clear operational definition of collected data. In the last column we identified measures, attributes and their stratification.

As presented in Table 1 we defined number of general variables such as date, period, duration, last place, place, participation fee, tradition, size etc. Except these general measures that could be easily collected for all different conferences we defined several additional variables such as organizer, sponsor, origin, presenters, attendees, communication and scope, based on categorization of communication groups and types presented in Figure 7 and explained below.

As already explained in the Introduction, the main purpose of any conference is establishing communication within and between different groups of people. Therefore, in order to compare CTI conferences we defined four possible categories of people involved called communication groups and shown in Figure 7. These are academy, development (and production), service providers and end users (consumers). Communication within and between communication groups is divided into communication types also presented in Figure 7. These are called: science, research, development, application, business, marketing and consuming.

Table 1. Data Collection Plan (DCP)

| Question to be answered | Name of Data | Operational Definition | Related Measures (Stratification) |
|--|-------------------|--|--|
| Conference abbreviation | Abbr | Conference abbreviation | - |
| Conference name | Name | Full name of the conference | - |
| Conference web place | Link | Web link on conference | Link |
| Conference date | Date | Date of last conference | Yyyy.mm.dd |
| Conference Periodicity | Period | Periodicity of conference occurrence | Annual, biannual, monthly |
| Conference duration | Duration | Number of days | Number |
| Last conference place | Last place | Place of last conference | Name of town, conference hall |
| Usual conference place | Place | Place of conference occurrence | Fixed, change |
| Participation fee | Participation fee | Cost of participation | Number in EUR |
| Conference Size | Size | Number of participants at the last conference | Number |
| Conference tradition | Tradition | How many times the conference has occurred in the past | Number |
| Main Sponsors | Sponsor | Type of sponsors supporting the conference | Ministry (M), European (international) foundation (EF), Academic (A), Developers (D), Service Providers (SP) |
| Organizers | Organizer | Type of organizer organizing the conference | Ministry (M), European (international) foundation (EF), Academic (A), Developers (D), Service Providers (SP) |
| Conference presenters | Presenter | Communication group of presenters at conference | Academic (1), Development (2), Service providers (3), End users (4) |
| Conference participants | Attendee | Communication group of audience interested in the conference | Academic (1), Development (2), Service providers (3), End users (4) |
| Communication types | Communication | Communication type performed at conference based on conference attendees | Science (1), Research (2), Development (3), Application (4), Business (5), Marketing (6), Consuming (7) |
| Number of communication types | Scope | Number of different communication types performed at conference | Number |
| Countries of participants (origin of people who pay fee) | Origin | Type of conference based on attendees origin | World wide International (WWI), Central Europe (CE), South East Europe (SEE), Croatia (CRO) |

Academy communication group consists of people working in a non-profit organization with main goal to give scientific contribution. Communication type within academy is called science.

On the other side we have development group, i.e. research teams placed in development organizations that do research but with the main goal to make profitable products. Their research is mostly related to problems based on experience and real case studies. For this type of research work the communication with academy is a prerequisite for success. We call this communication type research. Also, it is important for different development groups to share their experiences in application of theory to their products. These communication within development group is called development.

The third very important communication group responsible for offering services and product distribution to end users is called service providers group. It has the key role in the cash flow as interconnection between development and end users communication groups. In one direction service providers learn and choose from development group offers and further promote to end users. This communication type is called application. In the other direction they identify customer needs through market research and form requests towards development group. This communication type is called marketing. Another important communication type for service providers communication group is called business. For effective and efficient business operation it is very important to establish communication within the service providers group.

Finally, the last communication type is called consuming. It is related to sharing experiences between consumers of ICT products within the end users group.

B. Analysis and Results

Here we present the benchmark of ICT conferences based on the variables explained in the previous Subsection and given in DCP in Table 1. Also, in every graph we point out the position of MIPRO.

The official language at half of the analyzed conferences is English. Based on country of participants origin 20% of analyzed conferences are grouped into WWI (World Wide International), 30% are SEE (South East Europe) and the rest is CRO (Croatian).

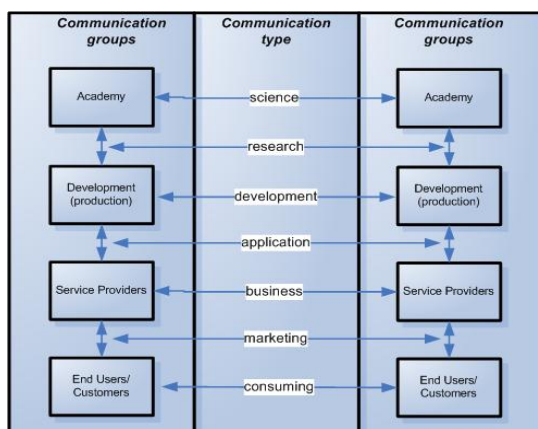


Figure 7. Communication groups and communication types

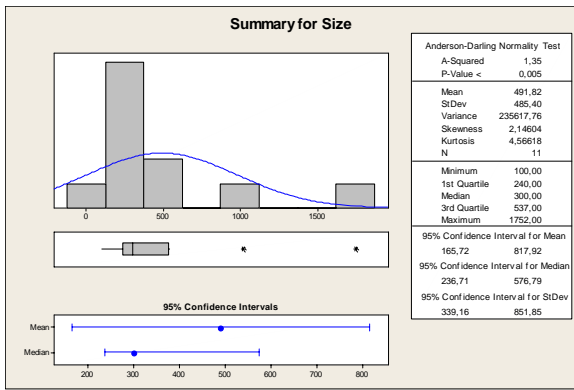


Figure 8. Conference size

Summary of results for conference size, tradition, duration and participation fee are given in Figures 8, 9,10 and 11, respectively.

Average ICT conference size is almost 500 participants. There is a very strong correlation between conference size and attendee communication group. Thus, for example conferences assigned to end users are much bigger than conferences assigned to academy. As already explained in the first Section, MIPRO conference is covering almost all communication types and attracting more participants than an average ICT conference in Croatia.

The average tradition of ICT conference in Croatia is 11 occurrences. MIPRO conference with its 30 years tradition belongs to conferences in Croatia with the longest tradition.

Most of the ICT conferences held in Croatia have three day duration and average participation fee is 271.46 EUR. MIPRO lasts for five days, which is more than average and has participation fee of 200 EUR that is less than average ICT conference in Croatia.

The variables presenter, attendee, communication and scope were categorized using communication groups and types introduced in previous subsection. Of course the same conference can be in several categories.

Analysis shows that the most frequent communication type at ICT conferences is business, as presented in Figure 12. This is a natural conclusion having in mind that the most frequent presenter at ICT conference, as well as the most frequent attendee, comes from the service providers communication group, as presented in Figures 13 and 14. Also participation of developers and academy as conference presenters and attendees is significant while end users are mostly only attendees.

Based on conference scope, the most frequent number of different communication types covered by an ICT conference in Croatia is three. The average is 3.36 and MIPRO with five communication types is among the conferences with the widest scope.

Most of the ICT conferences in Croatia are sponsored by developers, service providers and government as presented in Figure 15 and most of the conferences are organized by academic or service providers group as presented in Figure 16.

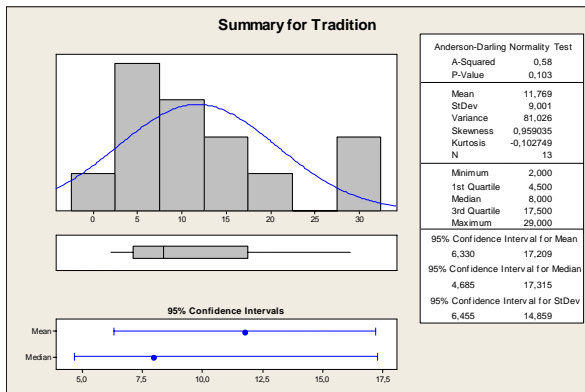


Figure 9. Conference tradition

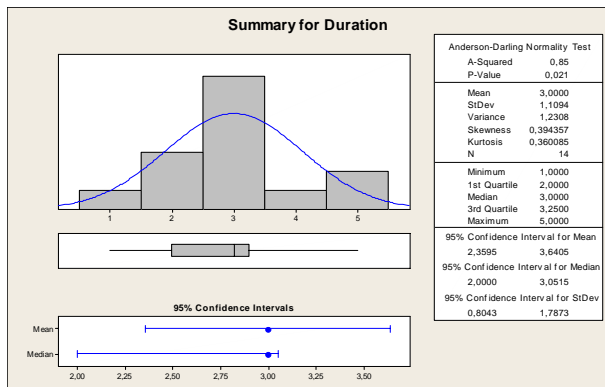


Figure 10. Conference duration

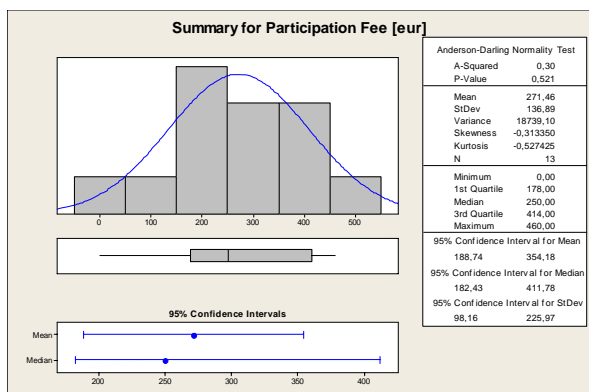


Figure 11. Participation fee

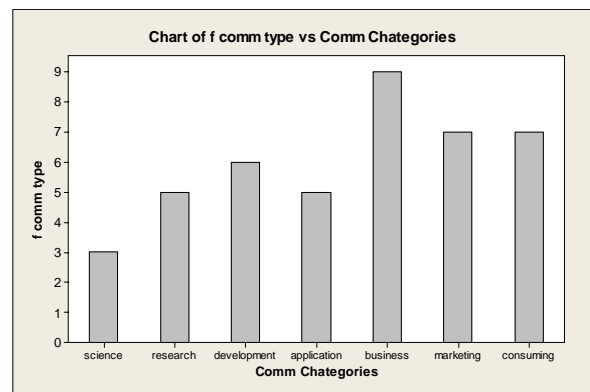


Figure 12. Communication category frequency at ICT

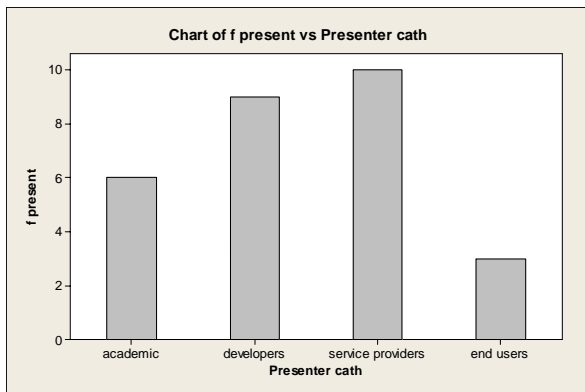


Figure 13. Conference presenter's frequency

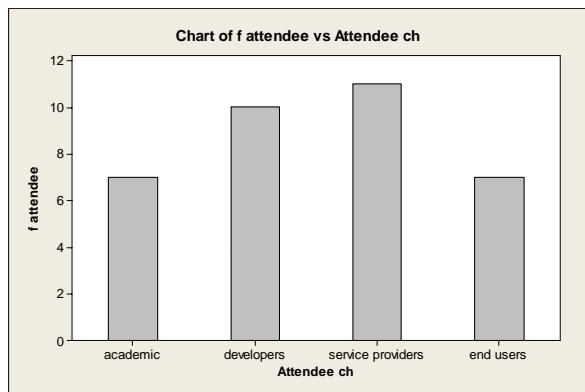


Figure 14. Frequency per attendee

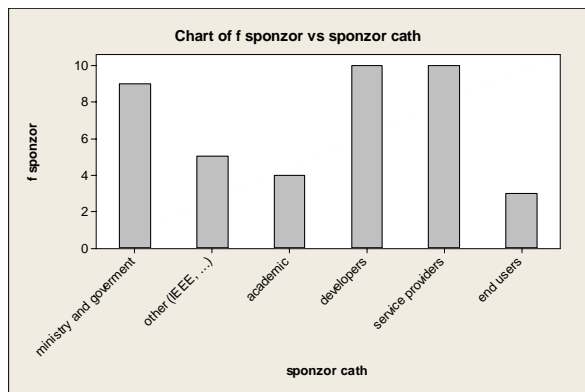


Figure 15. Sponsor frequency

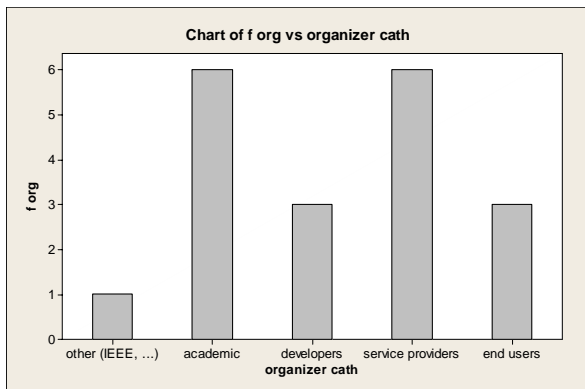


Figure 16. Organizer frequency

IV. CONCLUSION

ICT sector in Croatia is well developed and wide variety of conferences, workshops and seminars, among which MIPRO plays a significant role, ensures its promising future. It is important to stress frequent presence of both, industry (development and service providers) and academy, on ICT conferences frequently.

Concerning MIPRO, it was one of the main stirring wheels of the Croatian ICT sector in the past. Nowadays, its importance is not shading. On ICT conference benchmark scale, besides being a conference with the longest tradition, MIPRO is a conference with the widest scope and relatively low participation fee compared to its offering and duration. It belongs to conferences of greater size than average even though it is not assigned to end users.

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