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| **Keywords:** | Cooperation, open source, ecosystems of ICT Standardization |
| **Abstract:** | According to the enquiries on open source listed in section 20.3.4 of TSAG Report 8 in July 2016, this contribution provides some requirements, analysis and proposals on the cooperation with open source communities, aiming to improve the global ecosystems of ICT Standardization. A new WTSA Resolution 90 “Open source in the ITU Telecommunication Standardization Sector” was approved in Nov 2016, which need further analysis and actions both in TSAG and Study Groups level. |

# Background

In last TSAG meeting held in July 2016, C95 from China are discussed in RG-SC, and the requirement to consider guidelines for cooperation with open source communities was noted in the “Living List on issues regarding Strengthening Collaboration” in TD609R1. Four enquiries on open source are also listed in the section 20.3.4 of TSAG Report 8[1] as following,

*Contributions are solicited to the next TSAG RG-SC meeting to address the following questions:*

*a) What are the experiences of study groups and focus groups with open source? Is there a requirement of ITU-T study groups to collaborate with open source communities?*

*b) What are the possible relationships between ITU-T Recommendations and open source? How to develop ITU-T Recommendations in collaboration with open source communities? How can open source foster the implementation of ITU-T Recommendations?*

*c) What are the gaps with our existing instruments, processes and procedures (for example: Recommendations ITU-T A.5, A.25, A Supplement 5, JCAs, FGs, MoUs) when applied to interaction with open source communities?*

*d) What approaches to open source collaboration with other organizations are beneficial?*

A new Resolution 90 “Open source in the ITU Telecommunication Standardization Sector” [2] was approved in WTSA-2016 held in Hammamet, which need further analysis and actions both in TSAG and Study Groups level.

Taking into account the ITU-T’s objective to connect the world and bridge the standardization gap, this contribution provides some requirements, analysis and proposals on the cooperation with open source communities, aiming at improving the global ecosystems of ICT Standardization, which could be very helpful to solve the interoperability issues for the future ICT network and services.

# Considerations on the cooperation with open source communities

**2.1 Requirement to cooperate with open source communities**

In recent years, many ICT services providers, network operators and vendors are continually putting more and more resources and efforts on Open Source communities and projects, which could bring them many advantages as listed below:

1. Fully make use of the developing capacity of Open Source Communities, to reduce the developing time period and cost of one company, also increase the flexibility and scalability of whole system solution, which is an excellent example of Internet sharing economy model;
2. Operators could reach more openness capability on network and services, which could reduce the dependence risk on single vendor or provider;
3. Bring more openness and opportunities to the collaboration of ICT industry with many other industries, such as IoT and Smart cities.

With the rapidly development and increasing influence of Open Source Communities to ICT industry, the situation of international standardization has been greatly changed. Since some of the text based International Standards could not guarantee an implementable standard solution to ICT industry, and the importance and influence of many ITU-T Recommendations on requirements, architectures and frameworks will be dramatically decreased in the future, especially in IMT-2020, clouding computing, SDN/NFV, IoT and other technical area.

So it’s proposed for TSB Director and TSAG Chairman to consider the situation and developing challenge of ITU-T recommendations in related Study Groups in this study period. Further requirements and analysis on the cooperation with specific open source communities in IMT-2020, clouding computing, SDN/NFV, IoT and other technical area are requested to be collected bottom up from Study Groups and members. Through effective open discussion and collaboration with management team of SGs, TSAG could output the suggestions and guidelines top down, which are very helpful for the future of ITU-T.

Another import reason for pushing ITU-T to cooperate with Open Source Communities is to improve and enhance the ecosystems of International Standardization for ICT industry, especially in the situation that many similar Open Source Projects are operating in different communities to meet the same requirement of the industry, without well organization and collaboration to avoiding duplication and conflict. These will cause many compatibility and interoperability issues not only to the operators and vendors, but also to the whole ICT industry.

Figure 1 illustrate the ecosystems of International Standardization for ICT industry, and SDN/NFV related standards activities and open source projects are showed as an example to understand the situation and challenges to the whole industry. A unified Core Information Model, Yang based Data Model, Open Interfaces for API/NBI/SBI are expected to be achieved with the collaboration of ITU-T, ONF, TMF, IEEE, MEF and IETF, but there are several different approaches are under developing in different SDOs, which will cause many issues for the future.

As stated in Resolution 71 of PP-14, ITU-T is a global platform for governments and private sectors to coordinate development of non-discriminatory international standards, foster interoperability and improved performance of telecommunications/ICT equipment, networks, services and applications. ITU-T has the responsibility to consolidate the SDOs and Open Source Communities, which are very benefit to the development of ICT industry.



Figure 1 ICT Standards and Solutions Ecosystems: SDN and NFV related examples.

* 1. **Possible relationships between ITU-T Recommendations and open source**

As presented by C95[3] in last TSAG meeting, Figure 2 was modified to illustrated the possible relationships between ITU-T recommendation work items and Open Source Communities’ projects, the relationships is really dependent on the specific work items in ITU-T Study Groups.



Figure 2 Possible relationships between ITU-T work items and open source project

There are some types of cooperation relationships between ITU-T Recommendations and Open Source Projects for discussion:

1. Open Source projects or toolsets are used by ITU-T members for prototype design, with license permission from Open Source Community, to verify the specifications in ITU-T draft Recommendations. The verification results or toolsets are contributed to ITU-T as information content or appendix of a ITU-T Recommendation;
2. Open Source projects are managed by other SDOs or Forums, which have formal cooperation relationships with ITU-T (The list of organizations recognized according to Recommendations ITU-T A.4, A.5 and A.6 are shown in [4]). ITU-T Study Groups would like to use it to verify the specifications or enhance the implementation of ITU-T draft or published Recommendations;
3. Open Source projects are managed by other SDOs or Forums, which do not pass the qualification of referenced organizations as specified in A.4, A.5 and A.6. Such as ONF, which are still under the evaluation of A.4 and A.5 for more than 3 years. There are several open sources projects are under the management of ONF, which has a close cooperation relationships with Q12/15 and Q14/15, such as EAGLE-Open-Model-Profile-and-Tools, Snowmass-ONFOpenTransport.

**2.3 How to develop ITU-T Recommendations in collaboration with open source communities**

ITU-T have wide range of cooperative relationships with many other organizations. The technologies for which these organizations are responsible continue to converge, which has resulted in an increase of interdependency between ITU-T's work programme and the programmes of other organizations. It’s proposed to improve the current ecosystems of ITU-T and other organizations on ICT standards and solutions, with the introduction of Open Source Communities and Projects, to enhance the industry influence of ITU-T and could rapidly meet the requirements for Standards Solutions.

The following questions on generic procedures are proposed to be considered firstly as the start points for the research of guidelines for collaboration with Open Source Communities.

1. How to solve the IPR issues with the related Open Source Community or Open Source Projects for specific ITU-T Recommendations?

In order to facilitate the further analysis of IPR issues with Open Source Community in IPR Ad-hoc Group, the ONF related projects, and ONAP, ODL, ONOS projects under the management of Linux Foundations are proposed to be chosen as the first batch of pilot projects for cooperation on SDN/NFV related ITU-T Recommendations.

1. How to qualify the Open Source Communities as partnership and external cooperation of ITU-T in TSB or TSAG? Does it need to revise A.4, A.5 or set up a new A.sup work item for Open Source Community according to the further analysis?
2. In spite of the IPR issues and A.4/A.5 qualification issues, it’s proposed that the cooperation relationships between ITU-T and Open Sources Communities, could be considered to follow the specification of ITU-T A.sup5 “Guidelines for collaboration and exchange of information with other organizations” [5], be carried out in one of three ways: by means of a liaison, by means of collaborative work or by means of a common team.

# Proposals

It’s proposed for TSAG to consider the above requirements, possible relationships and procedure related proposals for the cooperation with Open Source Communities, and encourage the first trail of cooperation in the level of Study Groups or Rapporteurs Groups in ITU-T.

# References

[1] Report of the fifth TSAG meeting held in Geneva, 18-22 July 2016, T13-TSAG-R-0008

[2] WTSA Resolution 90 – Open source in the ITU Telecommunication Standardization Sector, Hammamet, 25 October – 3 November 2016

[3] T13-TSAG-C-0095, Propose TSAG to set up a new work item on “The influence of open-source to ITU-T working methods and programme”, P.R. China.

[4] List of Organizations recognized according to Recommendations ITU-T A.4, A.5 and A.6, <https://www.itu.int/en/ITU-T/extcoop/Pages/sdo.aspx>

[5] ITU-T A.sup5 “Guidelines for collaboration and exchange of information with other organizations”, July 2016.

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