

WHITE PAPER

A Proposal for a Standard Process for the Auto-ID Center

Sanjay Sarma

AUTO-ID CENTER MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 77 MASSACHUSETTS AVENUE, BLDG 3-449, CAMBRIDGE, MA 02139-4307, USA

ABSTRACT

An important goal of the Auto-ID Center is to recommend standards. This document sets forth a **proposal** for a formal process for discussing, creating and documenting standards recommendations. In essence we describe the evolution of a technical document from the stage where it represents a fledgeling idea to the stage where it represents a recommendation for a standard.

The structure proposed here is inspired by the very successful model created and used by the World Wide Web Consortium (W3C). The original W3C document is available at: <http://www.w3.org/Consortium/Process-20010719/tr.html#Recs>. The structure also captures the realities of developing hardware standards, and the spirit of the Auto-ID Center.

The document has three major sections. Section 2 deals with the membership of the recommendation-forming groups, and the audiences of these groups. Section 3 deals with the process of forming a recommendation. Section 4 deals with documentation.

WHITE PAPER

A Proposal for a Standard Process for the Auto-ID Center

Biography



by Sanjay Sarma
Research Director

Sanjay Sarma received his Bachelors from the Indian Institute of Technology, his Masters from Carnegie Mellon University and his PhD from the University of California at Berkeley. In between degrees he worked at Schlumberger Oilfield Services in Aberdeen, UK, and at the Lawrence Berkeley Laboratories in Berkeley, California. Dr. Sarma's Masters thesis was in the area of operations research and his PhD was in the area of manufacturing automation. From 1995 to 1999, Dr. Sarma was an assistant professor in the Department of Mechanical Engineering at the Massachusetts Institute of Technology. He is now an associate professor.

WHITE PAPER

A Proposal for a Standard Process for the Auto-ID Center

Contents

- 1. Introduction 5
- 2. Groups and Audiences 5
 - 2.1. The Action Group 5
 - 2.2. The Sponsors 6
 - 2.3. The General Public 6
 - 2.4. Intellectual Property 6
- 3. The Recommendation Track 6
 - 3.1. Working Draft (WD) 8
 - 3.2. Last Call Working Draft 8
 - 3.3. Candidate Recommendation (RC) 9
 - 3.4. Proposed Recommendation (PR) 9
 - 3.5. Recommendation (REC) 10
- 4. Documentation 10
 - 4.1. Technical Reports 10
 - 4.2. Feedback 11
 - 4.3. Response to Feedback 11
- 5. Conclusions 11

1. INTRODUCTION

An important goal of the Auto-ID Center is to recommend standards. This document sets forth a **proposal** for a formal process for discussing, creating and documenting standards recommendations. In essence we describe the evolution of a technical document from the stage where it represents a fledgeling idea to the stage where it represents a recommendation for a standard.

The structure proposed here is inspired by the very successful model created and used by the World Wide Web Consortium (W3C). The original W3C document is available at: <http://www.w3.org/Consortium/Process-20010719/tr.html#Recs>. The structure also captures the realities of developing hardware standards, and the spirit of the Auto-ID Center.

The document has three major sections. Section 2 deals with the membership of the recommendation-forming groups, and the audiences of these groups. Section 3 deals with the process of forming a recommendation. Section 4 deals with documentation.

2. GROUPS AND AUDIENCES

There are three groups that will be involved in the standards recommendation process: the Action Group (AG), the Auto-ID Center Sponsors and the General Public. We discuss the role of each below.

2.1. The Action Group

The Action Group will consist of:

1. Representatives from the MIT Auto-ID Center.
2. Representatives from Sponsor Companies which have the capability and the intention of participating in a substantial and direct way in the development of the technology.
3. Technology experts agreed to by the other members of the Action Group.

The purpose of the Action Group is ad hoc and focused. The formation of a Action Group must be mandated by the Board of Overseers. The charter of the Action Group will, in future, be captured in a Requirements Document for that Action Group. Membership in the group will be limited to 1–4 companies which have direct involvement in the development of the technology, and which have demonstrated an intention of committing resources to the effort. An Auto-ID Center Research Director will act as a Director of the Action Group. Members will be expected to participate in meetings of the Action Group at the expense of their companies. Exceptions may be made in the case of technology experts. The Action Group will nominate a Scribe, who will be in charge of the Action Draft, described in Section 3. We recommend that Action Group meetings be attended by AG members only. This is to ensure that the group stays focused, but not intended in any way to keep the findings of the group confidential. Section 3 also describes how the Action Group will share its work with Sponsors and the General Public.

2.2. The Sponsors

The Sponsors of the Auto-ID Center, including technology and end-user Sponsors, will have access to the status of the work of the Action Group. Requests can be made of internal draft documents, which the Action Group will endeavor to provide in reasonable time. Formal milestone documents will also be published to Sponsors as soon as they are completed and agreed. We encourage Sponsors to wait for these milestone documents, described next, rather than requesting draft documents.

2.3. The General Public

Eventually, it is the goal of the Auto-ID Center to make all its recommendations public. The publication of the final document will follow the process described below. Draft documents and other internal documents will not necessarily be published.

2.4. Intellectual Property

A formal statement of intellectual property is currently being worked out. However, three underlying tenets of the intellectual property policy of the center are as follows:

1. All intellectual property developed as a part of the Action Group will eventually be owned by a non-profit organization representing the Auto-ID Community, and will be freely licensable by any organization world-wide.
2. All documents published by the Center will be copyright protected by the Auto-ID Center. Documents, when published to either the Action Group, or to the Sponsors, and will be seen as internal, confidential disclosures.
3. All participants in the Action Group will be required to disclose all intellectual property that they own, which may affect the use of the developed standard, as soon as such a situation becomes apparent.

3. THE RECOMMENDATION TRACK

The “Recommendation track” is the process that Auto-ID Center will follow to build consensus around an Auto-ID technology. The Auto-ID Center will turn a technical report into a Recommendation by following this process. The labels that describe increasing levels of maturity and consensus along the Recommendation track are:

Working Draft

A technical report on the Recommendation track begins as a Working Draft. A Working Draft is a chartered work item of a Action Group and generally represents work in progress and a commitment by the Auto-ID Center to pursue work in a particular area. The label “Working Draft” does not imply that there is complete consensus within the working group, or that the document is in a stage of completion. It simply attempts to capture the thinking of the group at some level. Other members of the Auto-ID Center may request copies of the Working Draft during its development, which the Scribe of the Action Group will make available within 2 weeks of such a request. If this is not possible, the Scribe will provide a written explanation of the circumstances that prevent him or her from delivering the document as requested.

Last Call Working Draft

A Last Call Working Draft is a special instance of a Working Draft that is considered by the Action Group to fulfill the relevant requirements of its charter and any accompanying requirements documents. A Last Call Working Draft is a technical report for which the Action Group actively seeks technical review from the broader Auto-ID Center membership.

Candidate Recommendation

A Candidate Recommendation is believed to meet the relevant requirements of the Action Group's charter and any accompanying requirements documents, and has been published in order to gather implementation experience and feedback. Advancement of a technical report to Candidate Recommendation is an explicit call for implementation experience to members of the Auto-ID Center. For example, a candidate recommendation for an RFID specification is a call to RFID experts to prototype and experiment with the proposed protocol.

Proposed Recommendation

A Proposed Recommendation is believed to meet the relevant requirements of the Action Group's charter and any accompanying requirements documents, to represent sufficient implementation experience.

Recommendation

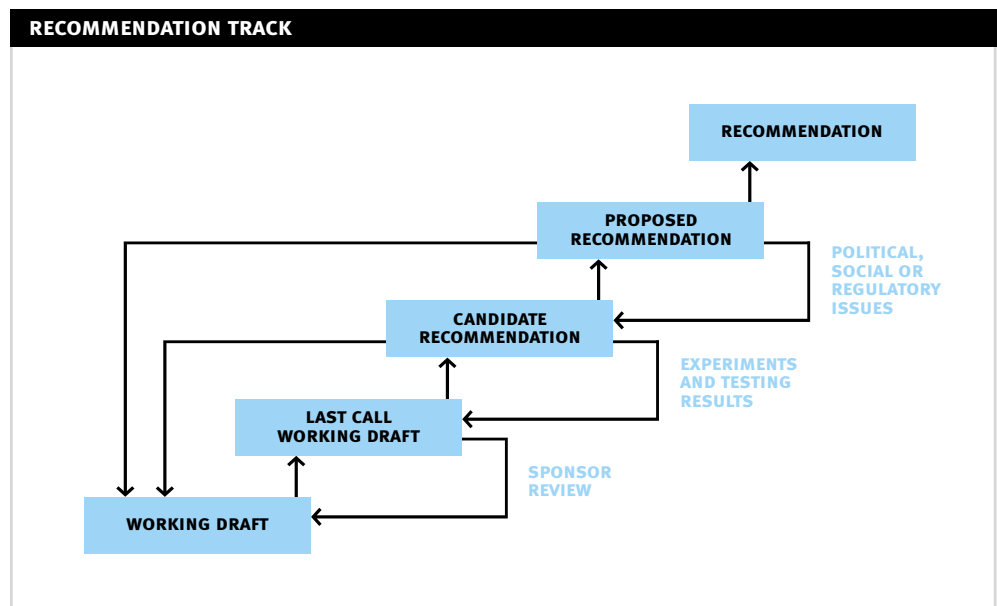
Recommendation is a technical report that is the end result of extensive **consensus**-building about a particular technology or policy.

Summary

Action Groups must archive each decision to request advancement of a technical report to the next maturity level of the Recommendation track. Any time a technical report advances to a higher maturity level, the announcement of the transition must indicate any **formal objections**. If, at any maturity level prior to Recommendation, review comments or implementation experience result in substantive changes to a technical report, the technical report should be returned to Working Draft for further work.

We elaborate below.

Figure 1: Possible transitions of the Recommendation track



3.1. Working Drafts (WD)

Entrance criteria

The Action Group must approve creation of a first public Working Draft (or version for review beyond the Membership). Creation of a Working Draft is **not** an assertion of consensus, of endorsement, or of technical and editorial quality. Consensus is not a prerequisite for approval to create a Working Draft, and the document may be created even if the content is unstable and does not meet all Action Group requirements.

Ongoing work

Once a Working Draft has been published, the Action Group should continue to develop it. It may seek feedback within and outside of the Action Group.

Possible next maturity level

The Action Group may advance a Working Draft to Last Call Working Draft.

3.2. Last Call Working Draft

Entrance criteria

Before advancing a technical report to Last Call Working Draft, the Action Group must:

1. fulfill the relevant requirements of the Action Group charter and those of any accompanying requirements documents, or document which relevant requirements they have not fulfilled; and
2. address all issues raised by Action Group participants and others from whom advice was formally or informally sought.

The Action Group advances a technical report to Last Call by sending a call for review to the entire list of Sponsors of the Auto-ID Center. Additional technical experts, preferably academic, may be included in this list. A meeting, where the standard must be presented, and where informal discussion may take place, will mark the Last Call announcement. The Last Call announcement must:

- specify the deadline for review comments;
- identify known dependencies and solicit review from all dependent Action Groups.

Duration of the review

Generally, a Last Call review period will be three weeks long, but it may be longer if the technical report is complex or has significant external dependencies.

Ongoing work

During a Last Call review period, members of the Action Group must be available or questions, clarifications or discussions with Sponsor members.

Possible next maturity levels

Feedback to the Action Group must be provided within the Last Call review period in a form that will be discussed in Section 4. After a Last Call review, the Action Group may request that the Director advance the technical report to Candidate Recommendation or Proposed Recommendation. If the Director does not advance the technical report to Candidate Recommendation or Proposed Recommendation, the Director must return it to Working Draft status.

3.3. Candidate Recommendation (CR)

Entrance criteria

Before advancing a technical report to Candidate Recommendation, the Director must be satisfied that:

- the Action Group has fulfilled the relevant requirements of the Action Group charter and those of any accompanying requirements documents. The Director must be satisfied with the rationale for any relevant requirements that have not been fulfilled;
- the Action Group has formally addressed all issues raised during the Last Call review period (possibly modifying the technical report);
- the Action Group has reported all formal objections;
- the Action Group has resolved dependencies with other groups.

Ongoing work

The sponsor members of the Action Group perform experiments, and to the extent possible, prototype, implement, test and experiment with the technology as described in the Candidate Recommendation.

This is a crucial period of the development of hardware standards.

Possible next maturity levels

After a Candidate Recommendation implementation period, the Action Group may request that the Director advance the technical report to Proposed Recommendation. If the Director does not advance the technical report to Proposed Recommendation, the Director must return the technical report to Working Draft by announcement to the Advisory Committee.

3.4. Proposed Recommendation (PR)

Entrance criteria

Before advancing a technical report to Proposed Recommendation, the Director must be satisfied that:

- the Action Group has fulfilled the relevant requirements of the Action Group charter and those of any accompanying requirements documents. The Director must be satisfied with the rationale for any relevant requirements that have not been fulfilled;
- the Action Group has formally addressed issues raised during the previous review or implementation period (possibly modifying the technical report);
- the Action Group has reported all formal objections; each feature of the technical report has been implemented.

The Director advances a technical report to Proposed Recommendation by sending a call for review to the Technology and End User Boards.

Duration of the review

The Proposed Recommendation review period must be at least four weeks.

Ongoing work

During the Proposed Recommendation review period, the Action Group should request endorsement and support from the Sponsors, as well as the General Public (e.g., testimonials for a press release).

The Director should ask the Action Group to address, in a timely manner, significant issues raised by the Sponsors during a Proposed Recommendation review. If asked by the Director, the Action Group must formally address these issues. Formal replies may be sent to reviewers after the end of the review (e.g., for reviews sent at the end of the review period).

During a Proposed Recommendation review, the Action Group should also formally address informed and relevant issues raised outside the Sponsors and report them to the Director in a timely fashion.

Possible next maturity levels

The Director may advance the technical report to Recommendation, possibly with minor changes from the version reviewed by the Advisory Committee. If the Director does not advance the technical report to Recommendation, the Director must return the technical report to either Candidate Recommendation or Working Draft.

3.5. Recommendation (REC)

Entrance criteria

The Director must be satisfied that there is significant support for the proposed document. The decision to advance a document to Recommendation is an Auto-ID Center decision. The Recommendation must be published to the Public.

The Director advances a technical report to Recommendation by sending an announcement to the Auto-ID Center Board.

Ongoing work

Auto-ID Center and its Sponsors should make every effort to maintain its Recommendations (e.g., by tracking errata, providing test-bed applications, helping to create test suites, etc.) and to encourage widespread implementation. The Action Group and editors should track errata and document clarifications.

The Auto-ID Center may publish a revised version of a Recommendation to make minor clarifications, error corrections, or editorial repairs, without following the Recommendation track. The status section of an editorial revision must indicate its relationship to previous versions (e.g., that it supersedes previous versions). The Team must notify the Members when an editorial revision of a Recommendation is published.

Possible next maturity levels

In this version of the Process Document, there are no maturity level changes after Recommendation; a technical report remains a Recommendation indefinitely.

4. DOCUMENTATION

Documentation will be an important part of the recommendation process. There are two forms of documentation: the technical reports, which will evolve from a Working Draft to a Candidate Recommendation, a Proposed Recommendation and finally, to a Recommendation; and the feedback documentation, which informs the Action Group of technical suggestions, improvements or objections. We describe them below.

4.1. Technical Reports

Technical reports will be maintained by the scribe of the working group. Within reason, technical reports will be kept clear, concise, and up to date. Version numbers of the form X.X will diligently be maintained.

Every major change will be numbered with a new first digit in the version number. Minor changes will be tracked by changing the number following the period in the version number. Versions will also be dated. The Scribe will maintain a record of each version. Where possible, the latest version will be made available to the Sponsors over an internal web site.

4.2. Feedback

Feedback will be a very important part of the standards development process. In particular, feedback must be clearly documented and must be provided within the deadlines for the feedback periods. Some guidelines for feedback are:

- the feedback must be constructive. A good faith effort must be made to add to the quality of the standard, guide its development, make it more robust, make it more efficient and make it more practical;
- the feedback must be written in crisp formal English. It must be as briefly expressed as possible to maximize the productivity of the Action Group;
- the feedback must be backed up, as much as possible, with scholarly evidence in the form of references, experimental data, simulation data, analytical explanation or carefully reasoned arguments.

The Director may discard feedback which does not meet these criteria.

4.3. Response to Feedback

The Action Group will make a good faith effort to respond to all acceptable feedback. Final discretion will rest with the Director, however. All feedback and all responses will be recorded, and will be made available to the Sponsors. A “feedback trail” will be maintained by the scribe all the way through the Recommendation stage.

If the feedback at any stage causes a reworking of the technical report, the status of the technical report will be returned to a lower stage. In the case of a major change, the technical report will be returned to the stage of Working Draft. This should not be seen as a “return to square one” however. Proceeding up the stages of the recommendation process will likely be much quicker in later iterations, and the iterations themselves will add great strength to the technical report.

5. CONCLUSIONS

This document is in itself a work-in-progress. It may change over time. While we do not intend to expose it to the rigors of the standardization process we have described here, it will likely be modified as we go through the process. However, the idea of due process is very important to us and will be taken very seriously, especially as new Action Groups are created. The first “trial balloon” is the UHF Cheap Chips Action Group. At the time of writing of this document, it is entering the Last Call Review Period, having already gone through much of the procedure which has been described here. Other efforts such as the HF Cheap Chips Action Group will be guided by our learnings from the UHF AG, and as documented here.

