



IEEE

Seminar IT-Standardisierung
Freie Universität Berlin

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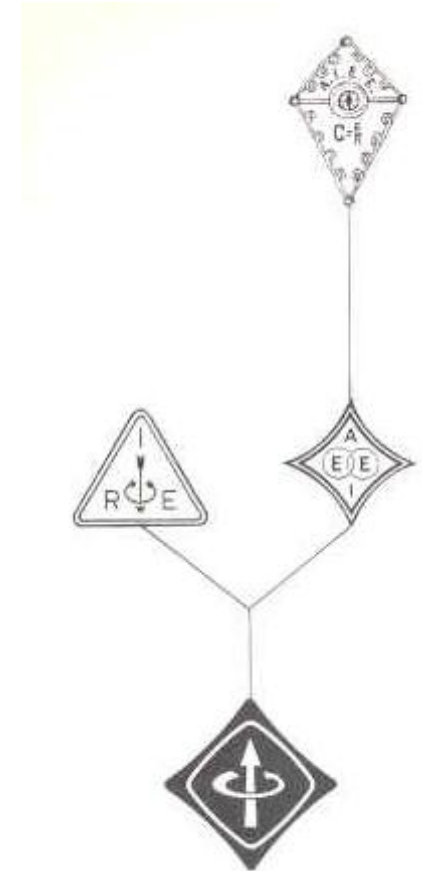
20.06.2007

Agenda

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History of IEEE (1)

- IEEE was formed in 1 January 1963 with the merger of:
 - AIEE (American Institute of Electrical Engineers)
 - IRE (Institute of Radio Engineers)
- AIEE - Quick Facts:
 - formed on 13 May 1884 in New York
 - Major interests were wire communication and light & power systems
- IRE – Quick Facts:
 - formed 1912 by two largely local organizations:
 - The Society of Wireless and Telegraph Engineers
 - The Wireless Institute
 - mayor goal: an international society for scientists and engineers involved in the development of wireless communication



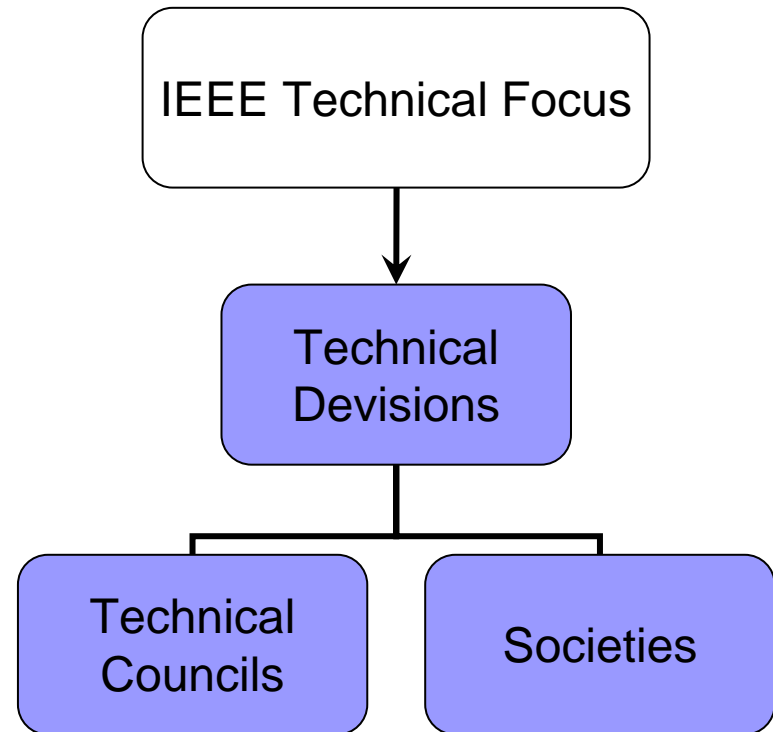
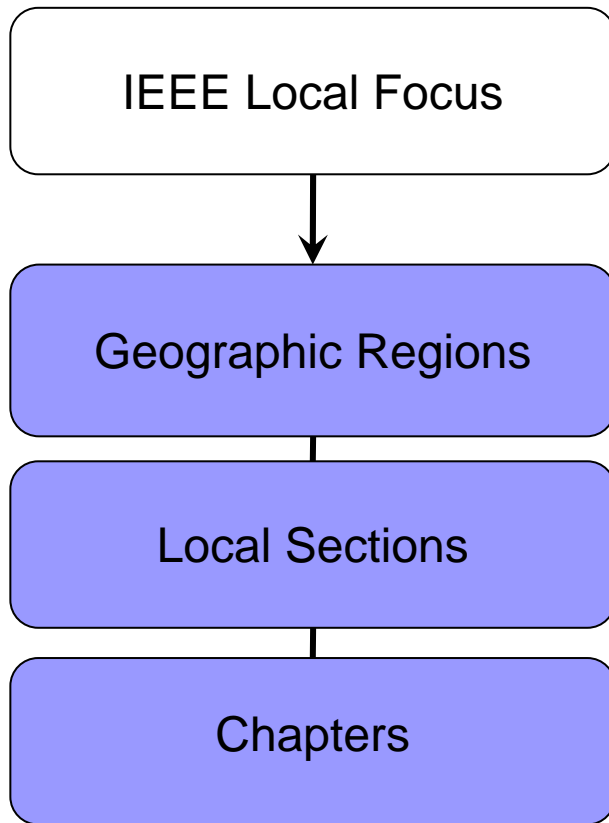
History of IEEE (2)

- AIEE & IRE had same structural development and general activities
 - specialized segments gathered into professional groups under central governing body
 - geographical units and student branches were formed
 - meetings and publications → creation of an extensive literature and exchange of knowledge
 - membership grades
 - standards development became a major effort
- many IRE members also were members of the AIEE
- 1930 the extensive applications of electron tube technology
- → more and more difficult to distinguish the AIEE & IRE technical boundaries
- after WWII increase in competition
- problems of overlap and duplication of efforts arose
- 1961 leadership of both sought to resolve difficulties through consolidation → merger plan was constructed
- IEEE = Institute on Electrical & Electronics Engineers, Inc. was formed

IEEE Today (2006.12.31)

- Non Profit Organization
- more than 370.000 members in over 160 countries
 - including 80.000 students
- 319 local sections in 10 geographic regions
- about 1.676 Chapters (356 Student Branch Chapters) unite local members with the same technical interest
- more than 1.430 student branches at colleges & universities in 80 countries
- 39 societies & 5 technical councils compose 10 technical divisions
- > 450 IEEE sponsored (or cosponsored) conferences worldwide each year
- >900 active IEEE standards and >400 in development

Disposition of IEEE





Science Regions

- aerospace systems
- computers
- telecommunication
- biomedical engineering
- electric power
- consumer electronics

The IEEE Mission

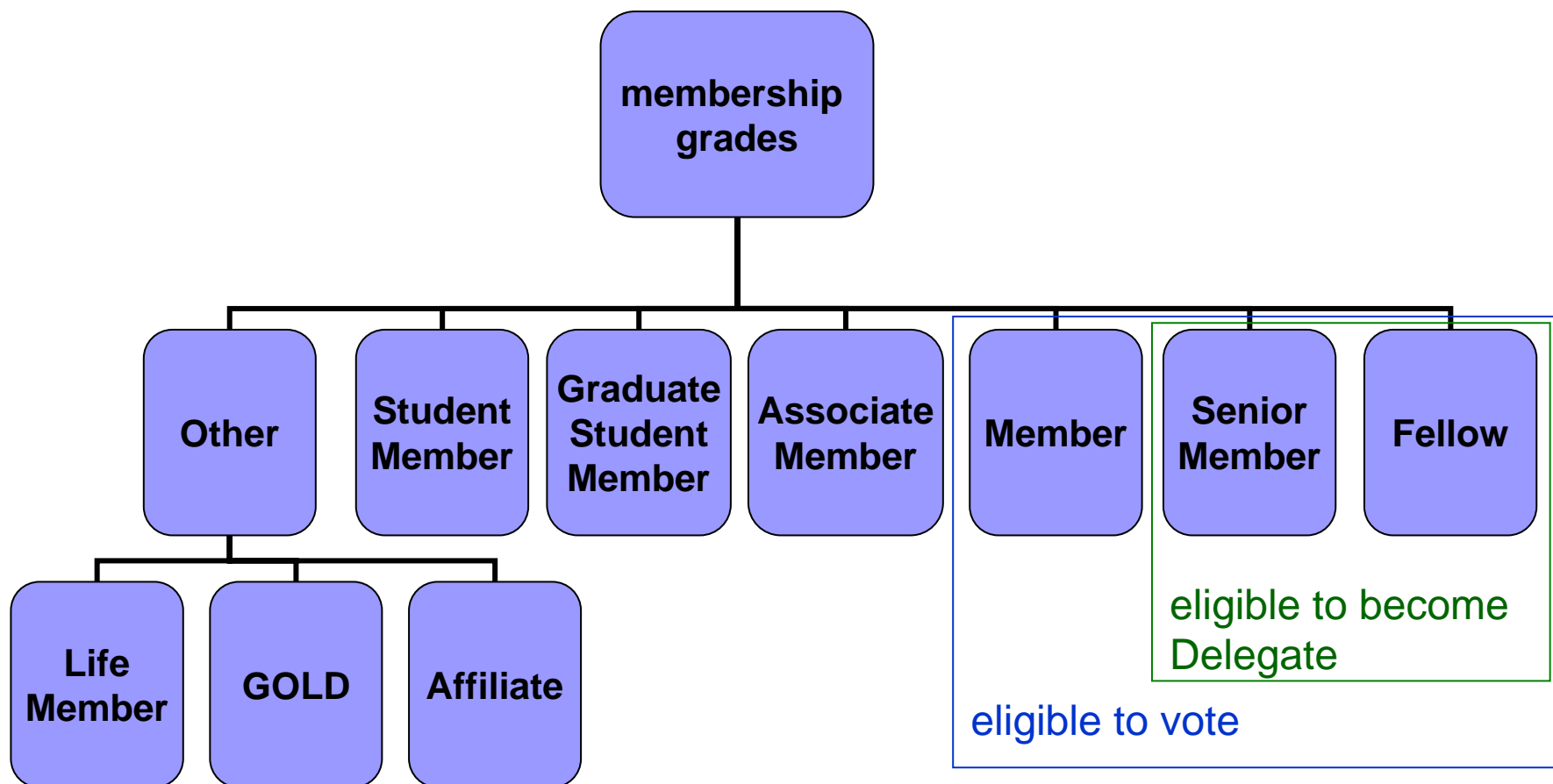
- support of promoting the engineering profession for the benefit of humanity & the profession
- funds university accreditation
- help introducing technology careers to young people around the world (including affordable student membership)
- philanthropic support approximately US\$ 2 Million every year
- develop educational & public information programs
- sustain historical research services
- subsidize workshops to facilitate exchange of electronic information
- increase public awareness about the vast impact of engineering on society
- the cooperation with industry, universities and government to raise students literacy in science, math, engineering & technology
- providing its members continuing education units and professional development hours to meet their continuing education requirements



IEEE Membership

- Membership open to individuals in IEEE designated fields:
 - Engineering
 - Computer Science
 - Information Technology
 - Physical Science
 - Biological & Medical Sciences
 - Mathematics
 - Technical Communications
 - related Education, Law & Policy

IEEE Membership Grades (1)



IEEE Membership Grades (2)

■ Student Member:

- min 50% of normal academic program (full time) as registered graduate or undergraduate student
- max 8 years:
 - achieved a degree → transfer to Full Member
 - else → transfer to Associate Member

■ Graduate Student Member

- min 50% of normal academic program (full time) as registered Graduate Student & qualify for Member grade
- max 8 years:
 - achieved a degree or after 8 years limit → transfer to Full Member

IEEE Membership Grades (3)

■ Associate Member:

- technical & non-technical applicants
- do not meet the qualifications for member grade
- benefit through membership & IEEE participation
- encouraged in continuing education & work experience → requalification for member grade possible

■ Member:

- satisfied IEEE-specified educational requirements and/or demonstrated professional competence
 - 3-5 years university level or higher degree from accredited institution or program
 - 3-5 years university level or higher degree + 3 years professional work experience in teaching, creating, developing, practicing or managing
 - 6 years of professional work experience + competence in teaching, creating, developing, practicing or managing

IEEE Membership Grades (4)

- Senior Member:
 - engineer, scientist, educator, technical executive or originator
 - 10 years professional practice including significant performance over 5-6 of these years in one or more IEEE designated fields:
 - substantial responsibility or achievement
 - publication of papers, books or inventions
 - technical direction or management of important work with evidence of accomplishment
 - recognized contribution to the welfare of profession

IEEE Membership Grades (5)

■ Fellow:

- highest grade of membership
- unusual distinction in profession
- min 5 years member status
- conferred by Board of Directors upon a person with extraordinary record of accomplishments in any of IEEE designated fields

■ Honorary:

- not a Member of IEEE
- conferred by Board of Directors upon a person with extraordinary service to the humanity in any of IEEE designated fields

IEEE Membership Grades (6)

- other categories & qualifications:
 - Life Member:
 - over 65 years old
 - sum of membership years + ownage > 100 years
 - GOLD (Graduates Of the Last Decade)
 - post-student members who are within 10 years of receiving their first professional degree
 - 1988 IEEE approved formation of non-technical groups (affinity groups) worldwide
 - affinity groups formed under joint supervision of the local section (many varied activities, social and community minded)
 - each region has a designated GOLD Coordinator
 - Affiliate
 - no IEEE member
 - member of another prof.society who who wishes to affiliate to membership in specific IEEE society
 - not entitled to any IEEE benefits or services, only from affiliated society
 - pays separate annual affiliate fee + IEEE society's annual membership dues

IEEE Membership Dues 2007 (1)

- memberships run from 1 January through 31 December
- new applications between 16 August 2007 – 28 February 2008 → full year dues
- new applications between 1 March 2007 – 15 August 2007 → half year dues ((***only** new members!), ending 31 December 2007)

| Residence | Member Full year | Member Half year * | Student Full Year | Student Half year * |
|-----------------------------|------------------|--------------------|-------------------|---------------------|
| United States | \$161.00 | \$80.50 | \$30.00 | \$15.00 |
| Canada (incl. GST) | \$149.38 | \$74.69 | \$31.80 | \$15.90 |
| Canada (incl. HST) | \$159.22 | \$79.61 | \$34.20 | \$17.10 |
| Africa, Europe, Middle East | \$134.00 | \$67.00 | \$25.00 | \$12.50 |
| Latin America | \$127.00 | \$63.50 | \$25.00 | \$12.50 |
| Asia, Pacific | \$128.00 | \$64.00 | \$25.00 | \$12.50 |

IEEE Membership Dues 2007 (2)

- + additional dues for Technical Societies involved

| Society (some examples) | Member Full year | Member Half year * | Student Full Year | Student Half year * |
|---------------------------------------|-------------------------|---------------------------|--------------------------|----------------------------|
| IEEE Aerospace and Electronic Systems | \$25.00 | \$13.00 | \$13.00 | \$7.00 |
| IEEE Computer | \$48.00 | \$24.00 | \$24.00 | \$12.00 |
| IEEE Engineering Management | \$30.00 | \$15.00 | \$15.00 | \$8.00 |
| IEEE Communications | \$42.00 | \$21.00 | \$21.00 | \$11.00 |
| IEEE Standards Association (IEEE-SA) | \$37.00 | Full Year Only | \$37.00 | Full Year Only |
| Women in Engineering (WIE) | \$25.00 | Full Year Only | Free | Full Year Only |

Annual Report of the Secretary 2005 & 2006

IEEE Membership change, by grade, during calendar year 2006

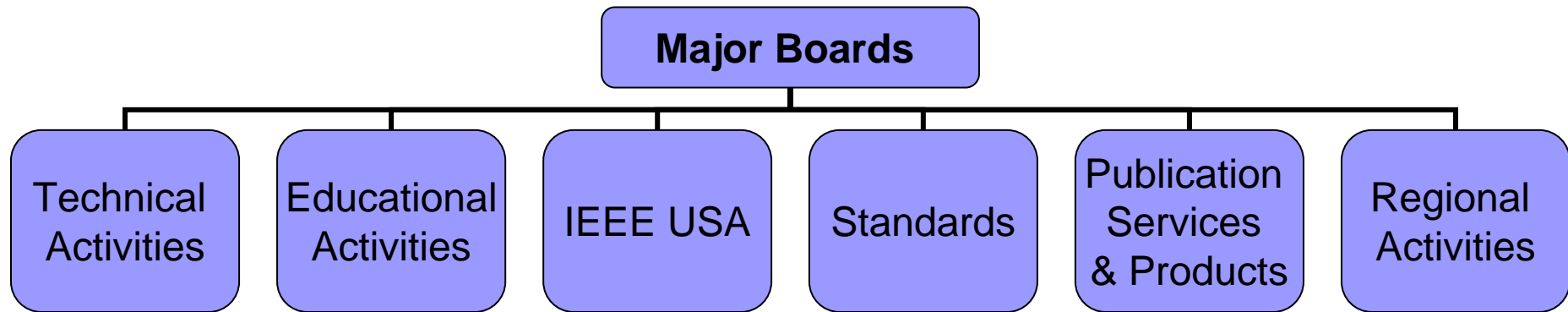
| Membership Grade | Senior Member | | Member | Associate | Higher Grade | | Student | Total |
|-------------------------------------|-----------------|--------|--------|-----------|--------------|---------|---------|---------|
| | Honorary Fellow | Member | | | Subtotal | Student | | |
| Active Membership as of 31 Dec 2006 | 28 | 5,888 | 29,140 | 2353,729 | 23,491 | 294,248 | 80,491 | 374,739 |
| Gain/(Loss) | 3 | 111 | 1,143 | 1,926 | -2,432 | 751 | 6,621 | 7,372 |

IEEE membership information is maintained at the IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ, 08855-1331, USA.

IEEE Membership change, by grade, during calendar year 2005.

| Membership Grade | Senior Member | | Member | Associate | Higher Grade | | Student | Total |
|-------------------------------------|-----------------|--------|--------|-----------|--------------|---------|---------|---------|
| | Honorary Fellow | Member | | | Subtotal | Student | | |
| Active Membership as of 31 Dec 2005 | 25 | 5,777 | 27,997 | 233,803 | 25,923 | 293,525 | 73,870 | 367,395 |
| Gain/(Loss) | 1 | 111 | 990 | (4,018) | (684) | (3,600) | 5,512 | 1,912 |

Major Boards (1)

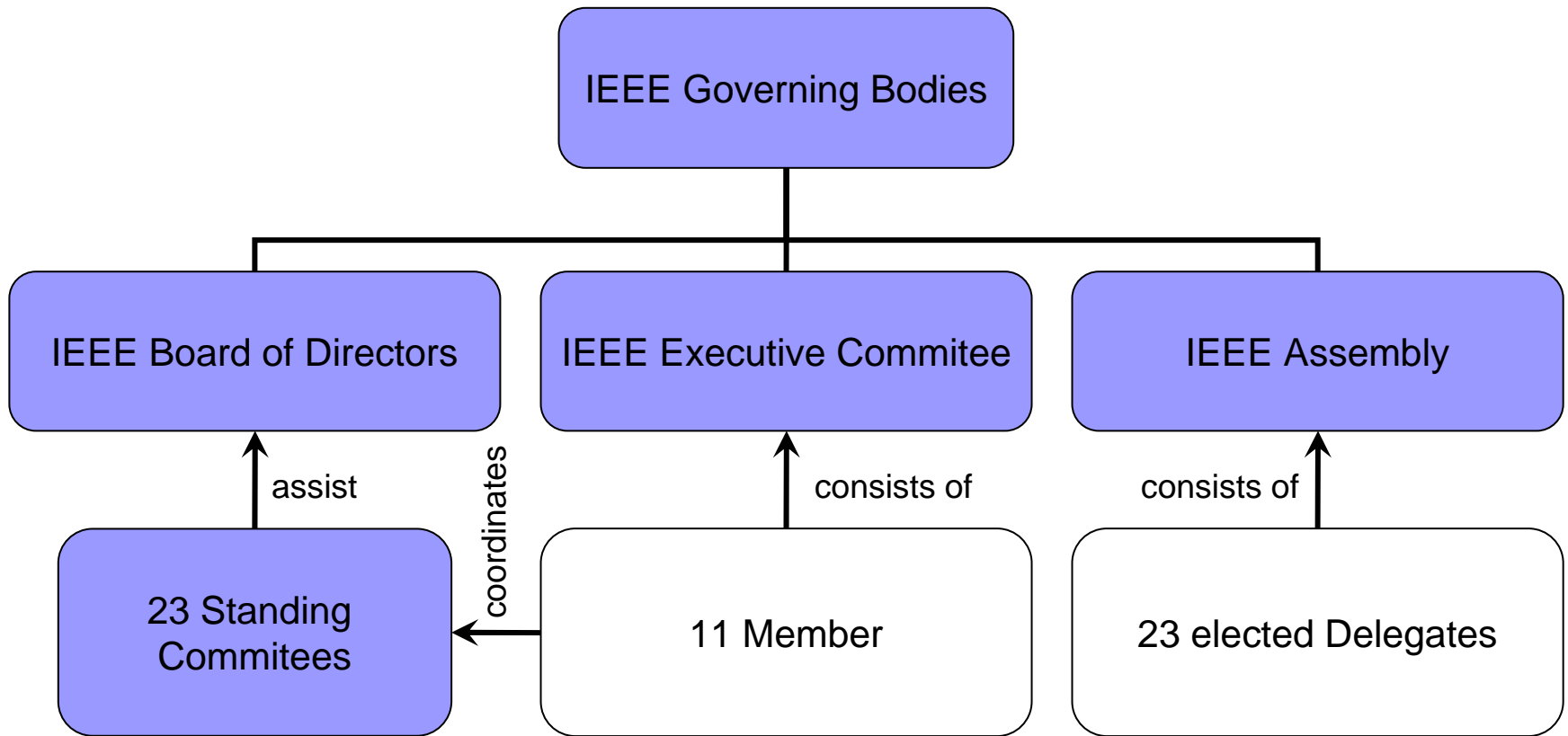


- govern major areas of IEEE interest
- each board has an elected volunteer leader

Major Boards (2)

- Technical Activities Board (TAB):
 - foster technological innovation by advancing the technical activities and to represent the interests of Societies and Technical Councils
- Educational Activities Board (EAB):
 - recommend policies on educational matters and implements programs specifically intended to serve educational pursuits inside and outside of IEEE
- IEEE USA:
 - recommend policies and implement programs specifically intended to serve and benefit members, profession and the public in the United States
- Publication Services and Products Board (PSPB):
 - report to the Board of Directors and shall be responsible for formulating and recommending information-related, published services and products policies to the Board of Directors
- Regional Activities Board (RAB):
 - organization of geographically-defined member units committed to the advancement of electrical engineering, electronics, computer engineering and computer sciences

IEEE Executives (1)



IEEE Executives (2)

■ Presidents:

- serve on the three top layer IEEE governing bodies
- election every year for 3 years
 - 1st year: President elect
 - 2nd year: President and Chief Executive Officer (CEO)
 - 3rd year: Past President
- election warranted for Member status or above
- ineligible to serve a second full term in that office

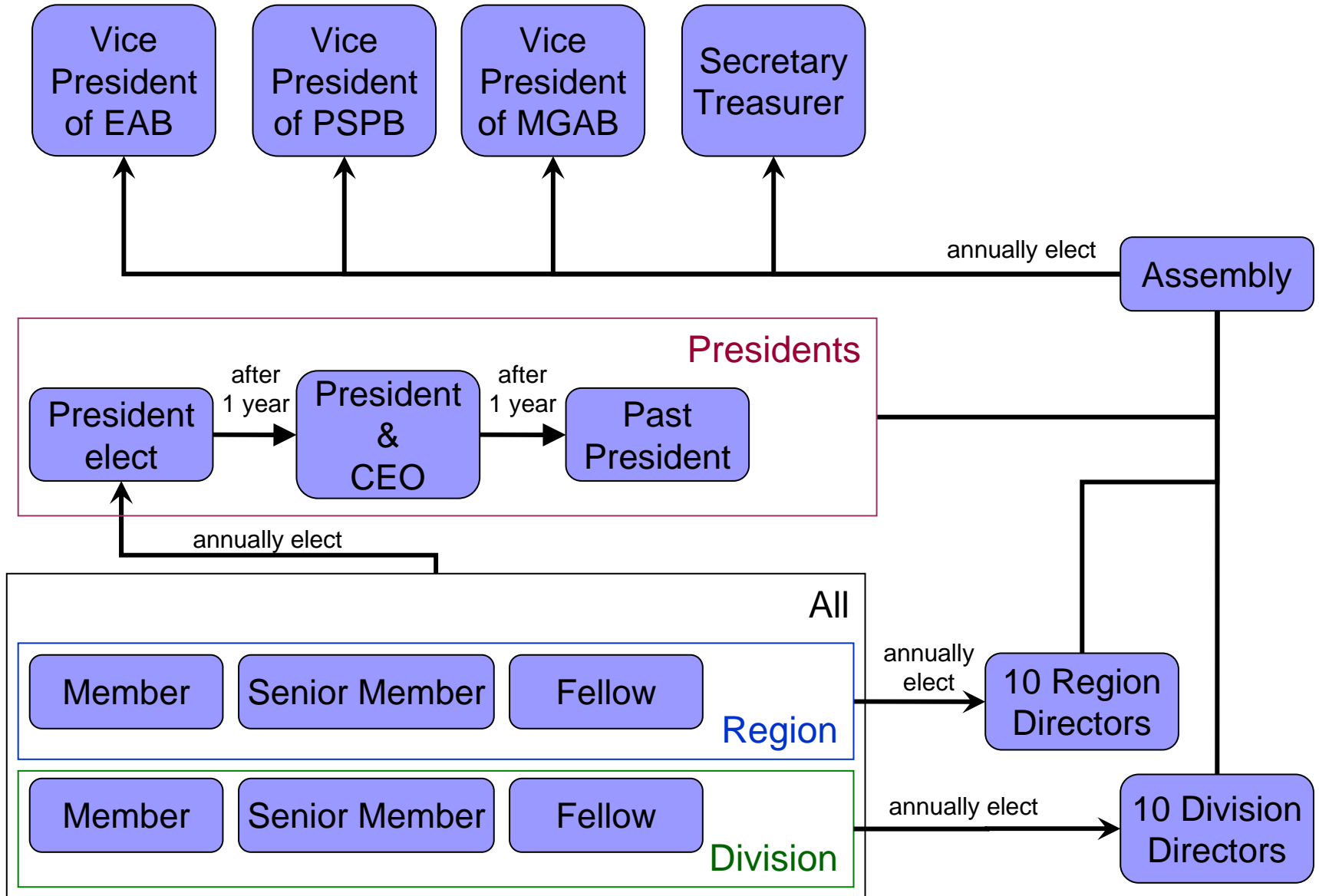
■ Board of Directors:

- consist of 30 Directors:
 - the Assembly
 - the 4 Directors elected by the Assembly
 - Vice President Technical Activities
 - IEEE-USA President
 - President IEEE-Standard Association
- three regular meetings the year

IEEE Executives (3)

■ Assembly:

- consists of 23 Delegates (shall be Fellow or Senior Member):
 - the three presidents
 - ten Region Delegates (voted Region Directors)
 - ten Division Delegates (voted Division Directors)
- Functions:
 - Election of four Corporate Officers (for one year):
 - Vice President - Educational Activities
 - Vice President - Publication Services and Products
 - Vice President - Regional Activities
 - Secretary-Treasurer
 - Receipt & Filing of Reports
- President Standards Association, President IEEE USA, Vice President Technical Activities will be elected by Members of correspondent Society



IEEE Executives (4)

■ Executive Committee:

□ consist of 11 Members:

- the three Presidents
- the (Vice)Presidents of the six Major Boards
- Secretary-Treasurer
- Division Director of the Computer Society

□ Executive Director = full-time chief operating officer who serves as Staff Secretary for the Assembly and provide the recordkeeping and secretarial functions

□ Functions:

- appoint, direct, and coordinate the work of all of its standing administrative committees
- authorize conventions, conferences, and meetings of the IEEE and approve their dates and locations

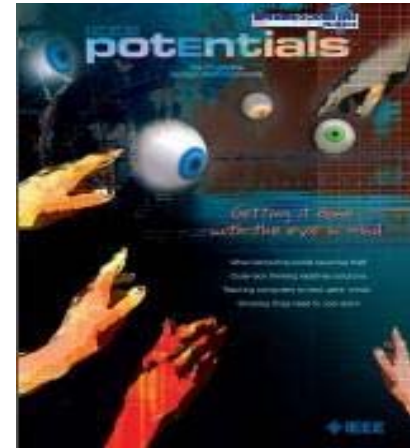
Opportunities for Members (1)

■ Knowledge:

- receive IEEE magazines (e.g. IEEE Spectrum, Potentials Online) including exclusive subscription rates on journals
- online access to TOC & expanded abstracts to more than 1 million IEEE documents
- special discounts on the purchase of conference proceedings, standards & books

■ Community:

- >300 local IEEE sections
- 1300 technical chapters
- 300 annual IEEE conferences worldwide
- attend your local section, chapter meetings & volunteer for leadership positions
- attend a conference to meet industry leaders & practitioners
- encounter latest research
- present your papers to international audience



Opportunities for Members (2)

■ Profession:

- IEEE Jobsite, Consultants Database, Career Publications
- technical & professional online courses from top universities & corporate educational institutions at exclusive discounts

■ Awards:

- IEEE Medal of Honor
 - IEEE's highest award
 - recognizes an individual for exceptional contribution or extraordinary career



IEEE NEWS



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DIGITAL SIGNAL PROCESSING AND SYSTEMS THEORIST DR. THOMAS KAILATH TO RECEIVE 2007 IEEE MEDAL OF HONOR

IEEE Also Honors 18 Other Technology Professionals, Including
Co-Founders of QUALCOMM Inc. and "Grandfather of Linux"

Toyota and Texas Instruments to Receive Corporate Awards for Breakthroughs in Hybrid
and Digital Light Processing

What is the IEEE-SA?

- Institute of Electrical and Electronics Engineers Standards Association.
- Developer of global industry standards in a broad-range of industries.
- Over 200 standard's ballots every year.
- 20,000 participants with a technical diversity (technology leaders from corporations, organizations, universities, and government agencies)



The IEEE-SA (IEEE Standards Association)

- Standards development activity of the IEEE
- Industry leaders create and promote internationally recognized standards
- To shape the direction of technology
- Enables its members to have direct influence on the outcome of standards projects through the ballot.



■ IEEE 802

- February of 1980.
- The number 802 was the sequence being issued by the IEEE

LAN with speeds from 1 to 20 MHz
Physical layer, Media Access Control, and
Higher Level Interface.
Accesses method (similar Ethernet and the
bus topology.)
By the end of 1980, a token access
method was added, and a year later there
were three MACs: CSMA/CD, Token Bus,
and Token Ring.

| | |
|--------|--|
| 802 | Overview and Architecture |
| 802.1 | Bridging and Management/Higher Layer LAN |
| 802.2 | Logical Link Control |
| 802.3 | CSMA / CD Access Method |
| 802.4 | Token-Passing Bus |
| 802.5 | Token Ring Access Method |
| 802.6 | Metropolitan Areas Networks |
| 802.7 | Broadband Technical |
| 802.8 | Fiber Optics |
| 802.9 | Integrated Service LANs |
| 802.10 | Standard for Interoperable LAN Security (SILS) |
| 802.11 | Wireless LAN |
| 802.15 | Wireless Personal Area Network |
| 802.16 | Broadband Wireless Access LANs |

How much does a membership cost?

- **Individual Membership Annual Dues**

\$37 for individuals who are also current IEEE members/IEEE society members.

\$198 for individuals who are not current IEEE members or IEEE society members

- **Corporate Membership**

Less than US \$1 million - Dues are US \$1000

US\$1 million to US \$1 billion - Dues are US \$3000

More than US \$1 billion - Dues are \$5000

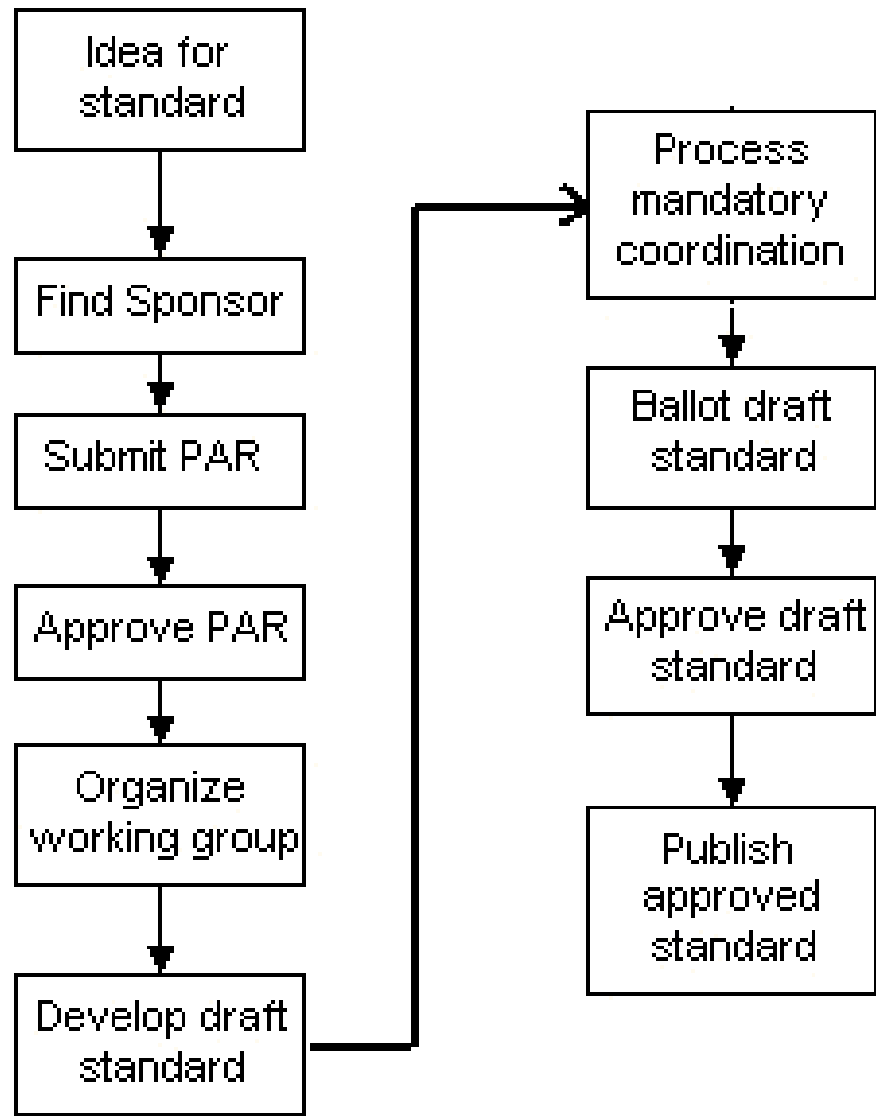
Government Agency - Dues are US \$5000

Trade Association or user group - Dues are US \$1000

University - Dues are US \$1000

Standards developing organizations - Dues are US \$1000

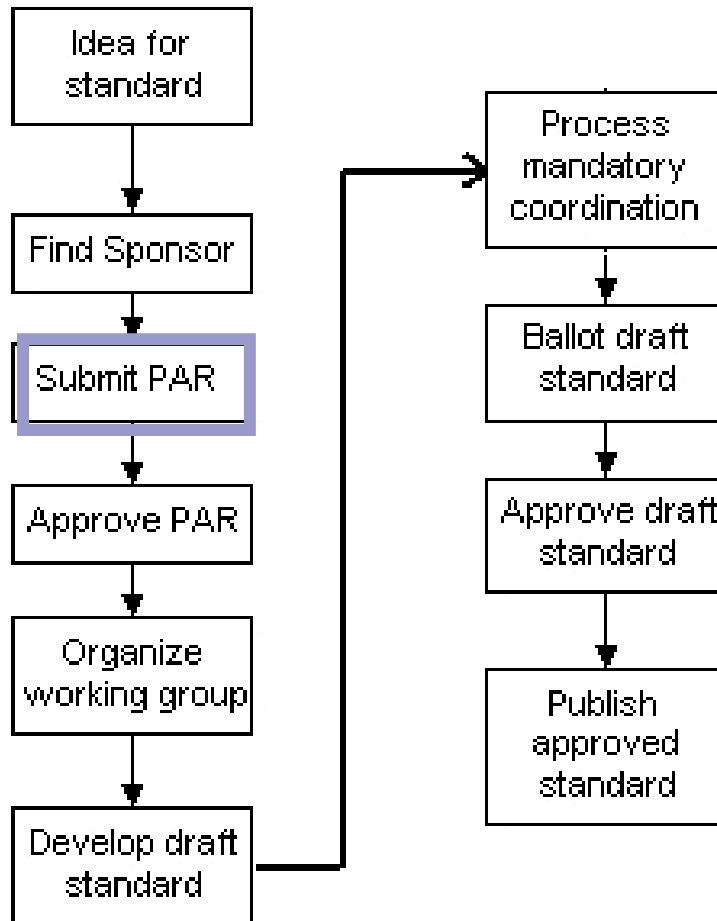
The Standards Development Process



What is a PAR?

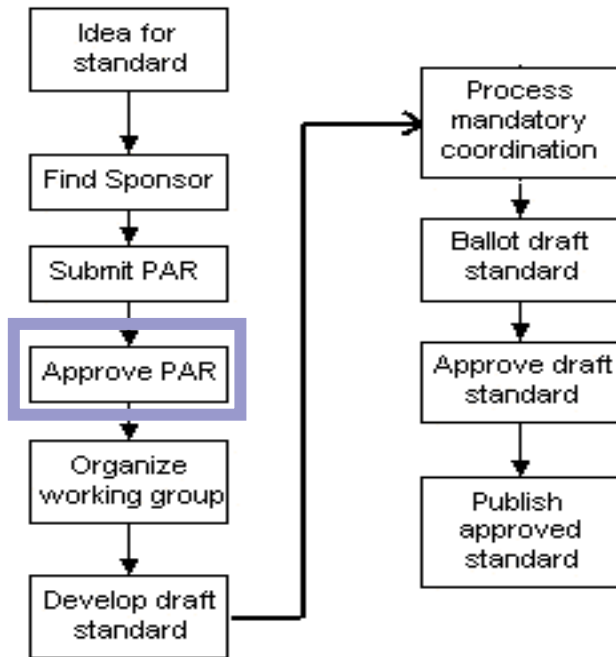
- Project Authorization Request
- Document contains scope, purpose and contact points for the project. The essence of the standard, why it exists and what it intends to do.
 - Small
 - Structured
 - Highly detailed
- 3 types of IEEE standard documents
 - Standard ("shall")
 - Recommended practice ("should")
 - Guide ("may")
- Kind of documents
 - New
 - A complete revision of an existing standard
 - An additional amendment to an existing standard
 - A corrigenda to an existing standard
- A standard cannot take longer than four years.

Submit a PAR



It can be submitted only by the Sponsor to the Nescom Administrator.

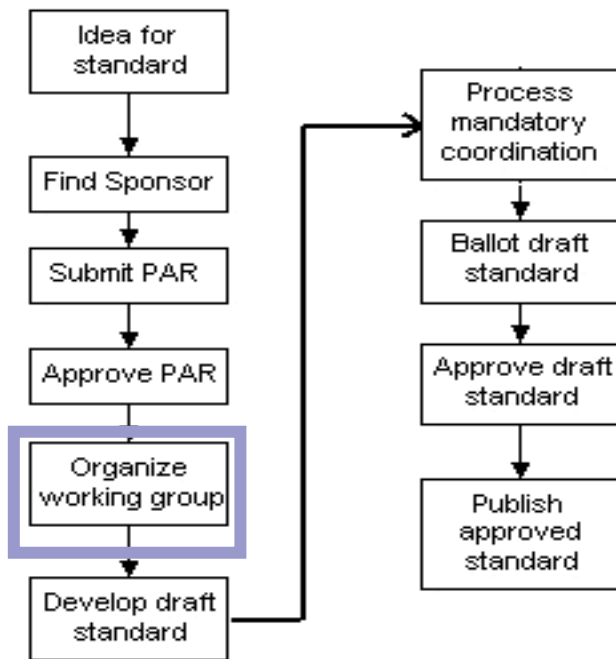
Approve PAR



Any work planned or underway for the proposed document will be sanctioned.

A Sponsor will assign a working group to prepare and develop the document.

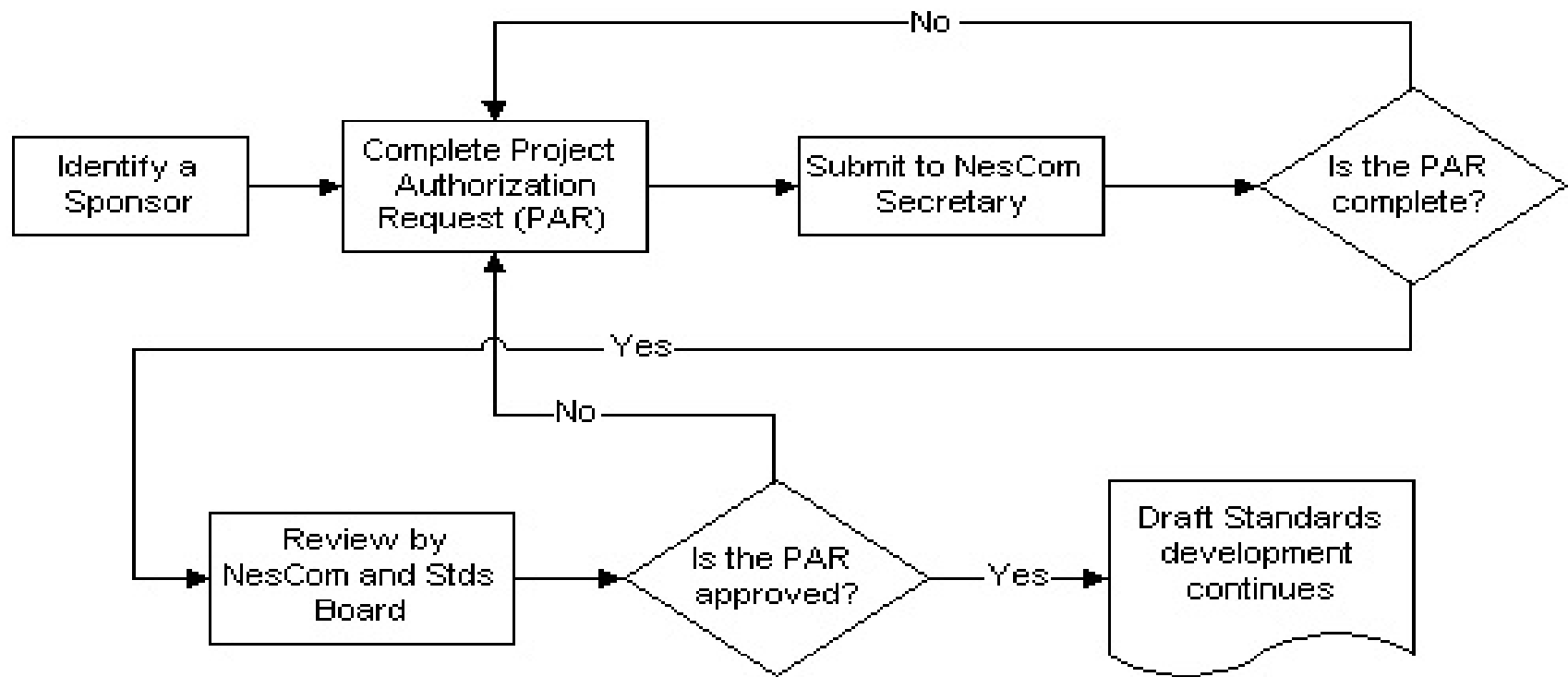
Working Group Development

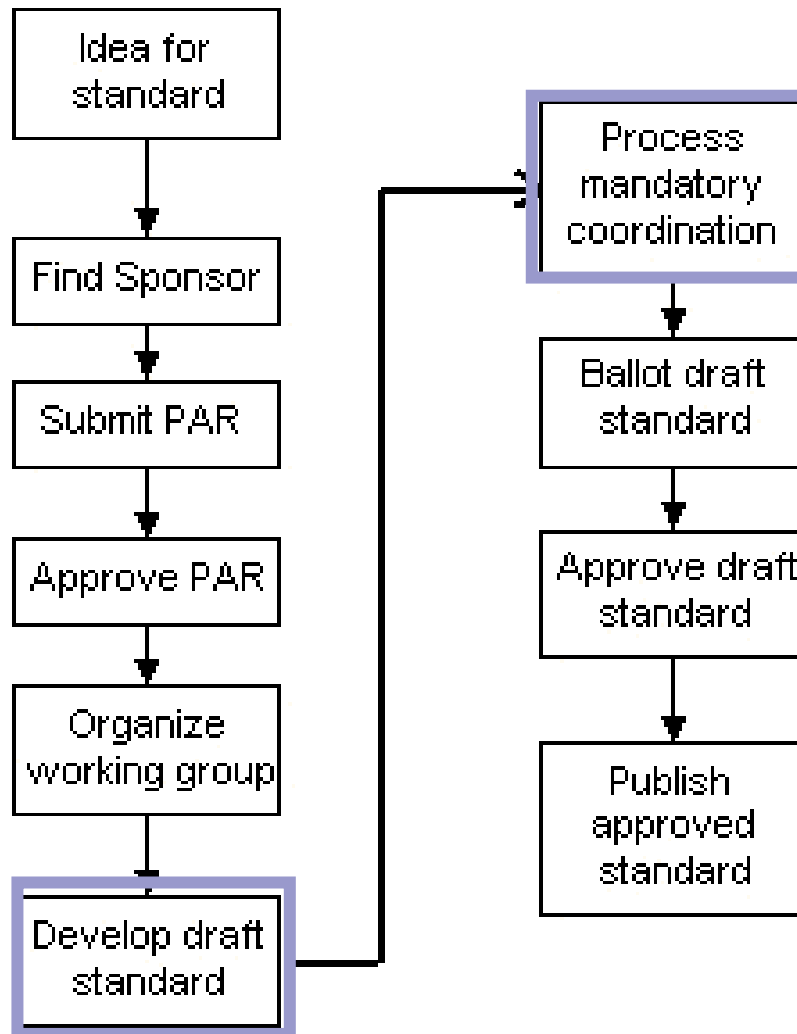


Will plan the meetings and organize the work.

Delegates assignments for developing parts of the standard.

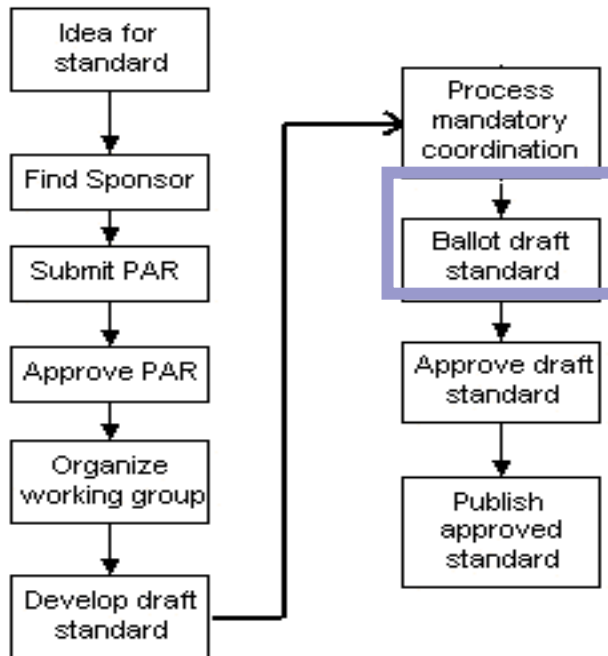
The groups are open to anyone to participate (Even non IEEE-SA members)





To guarantee the conformance with IEEE requirements and with all copyright permission

Ballot draft standard



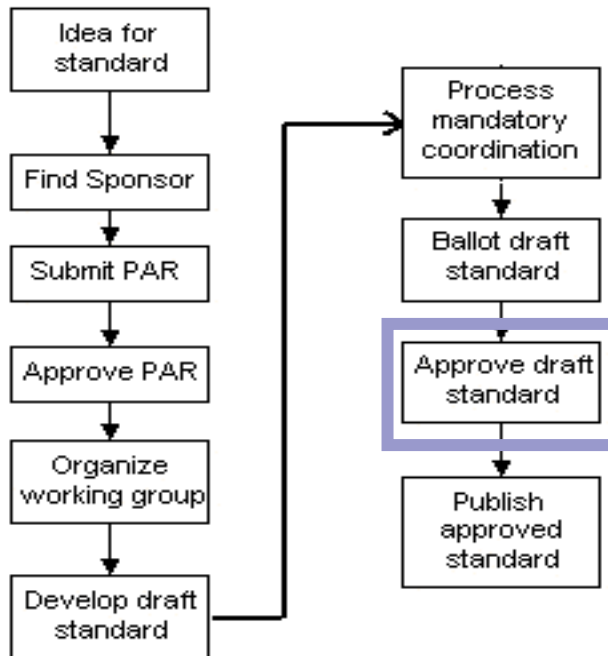
-Traditional balloting process by individuals only.

-Mixed balloting group made of non-individuals and individuals.

-Group balloting process made up of non-individuals only (entities like corporations, organizations, etc.).

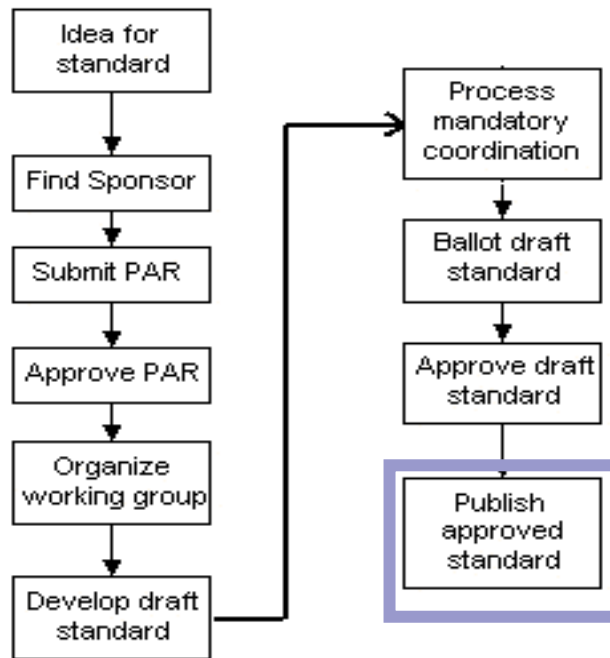
- Enroll in Activity Areas(s)
- Request for Mandatory Editorial Coordination
- Initiate Sponsor Ballot Invitation
- Initiate Sponsor Ballot
- Initiate Recirculation Ballot
- Submit Template

Approve draft standard



- An IEEE standard approval is achieved by sending the document and supporting material to the IEEE-SA Standards Board Standards Review Committee (RevCom), which distribute a recommendation to the IEEE-SA Standards Board.

Publish approved standard



- The role of this process is to ensure that the standard is grammatically and syntactically correct using American English.
- The objective is not to make any changes that affect the technical meaning of the standard.
- Reaffirm the standard:
 - Validity period of five years from the date of approval.

Sources

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- <http://standards.ieee.org/stdsdev/getinvolved.html>
- **Drahtlose Netze : mit 85 Tabellen / von Christoph Stepping**
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