BACKGROUND

In 2005, a conference was convened by the leadership of the Multinational Development of Women in Technology (MDWIT) in Baltimore, Maryland USA to explore the issues of women in technology. The two hundred and fifty participants, mostly women, represented over 29 countries from both the developed and developing regions of the world. Major stakeholders from the European Commission, the World Bank, the National Science Foundation, Microsoft, HP, TI, Cisco, IBM, UNESCO the Association of Progressive Computing and others came together to form a partnership in an effort to help women advance in areas of science, technology, engineering, and mathematics (STEM). The group met again in 2006 having created and circulated a Declaration of Agreement for Women and ICTs in five languages and which was supported by over 100 organizations (www.mdwit.org).

In the next two years an informal collaborative group of organizations, led by the U.S.-based leadership of the Multinational Development of Women and Technology (at that time called the Center for Women and Information Technology) achieved the following outcomes:

1. Creation of a Gender Stakeholder Network for the UN GAID
2. Cooperation through the UNESCO Regional Chair on Women in Science and Technology in Latin America with the Unit of Information Society of ECLAC.
3. Coordination of gender mainstreaming of GK3, the international conference held by the Global Knowledge Partnership
4. Initial steps toward creation of Centres for Women and ICTs which have been established in Europe and the Middle East.
5. The development of a Women in Technology organization for several of the Pacific Islands.
6. The creation of a standing committee on women for the World Federation of Engineering Organizations and its 90-member country-based engineering organizations, the result of the WFEO conference hosted by MDWIT’s leadership team in Tunisia in June 2007.
7. The creation of Women in Computer Science organization as part of the Brazilian Computing Association.
8. The creation of the women and technology group under the Women’s Leadership Network that supports APEC.
9. A report on women and IT in the Pacific Islands, in Fiji.
11. Two annual magazine issues highlighting gender for i4d (an Indian-based international magazine focusing on ICT for Development).
12. Multiple national, regional and international presentations and publications highlighting gender in STEM.

In addition, MDWIT independently formed its own organization in late 2006 which was established as a non-profit (501c3) in 2007 and launched with staff in 2008. The organization leadership traveled to over 22 nations participating in and developing programs for entrepreneurs and women leadership in technology.

The resultant impact of this work has been difficult to assess and questionable in its impact. Perhaps the greatest value in this work is the lessons learned that can influence the work of STI Capacity Building Global Forum to bring about greater development outcomes. For the purposes of this forum, this paper will focus on the Dimensions highlighted in Figure 1 as a vehicle for understanding how to build capacity.

**CHALLENGES FOR WOMEN PRESENTED BY THE CURRENT STI MODEL**

Gender is an extremely broad topic with complexities at every level of discussion and research. In addition, only a handful or women are actually doing research on gender and information and communication technology at the international level, which in itself may bias the outcomes of publications. Too often being a woman engineer is sufficient to qualify as an expert, but in fact simply provides an anecdote for study, not evidence. The research that is available is often representative of the work of better funded developed countries, based on data more easily collected from developed countries, or represents under-resourced researchers in developing countries who haven’t the expertise or mentors to develop rigorous high quality research. Finally, international data does not address the level of women’s participation in STI, making it difficult to draw conclusions about capacity and participation in STI. In addition, the work to date is seldom based on a solidly researched theoretical base.

To deal with these challenges, MDWIT offers our extensive research on gender and technology for consideration of the Global Forum.

For example, Dr. Eileen Trauth has developed a theoretical framework that she calls the individual differences theory of gender and IT for explaining the ways that women are exposed to, experience and respond to gender relations in the information technology profession in the US, but that may have far reaching applications internationally. There are two levels of focus:

1. Biases operating at a societal level to which all people in that society are exposed.
2. The variation among women with respect to how they personally internalize and respond to these gender group biases. This variation will be influenced by demographic characteristics (age, race, nationality and socio-economic class), personality (e.g. educational background, personality traits and abilities), individual influences (e.g. mentors, role models, family and significant life experiences), and socio-cultural influences (national and organizational cultural attitudes about women and men).
WOMEN ARE MISSING AT THE MIDDLE

Women and men can be characterized in the triangle below by their income or caloric intake per day, depending on the country and region. The lower the number, the poorer the individuals are considered and the lower they are placed on the pyramid. The larger the proportion of people within a country living at the lowest level of the pyramid, the greater the need for economic development.

Much has been made about the success of the impact of cell phone based banking and women’s micro-business development, and for good reason. Growing small businesses in rural and under-developed regions can have vast benefits for women, their families, and communities. Unfortunately the success of this focus on the bottom of the pyramid has concealed a lack of focus on women’s capacity to support economic development at the middle of the pyramid. As a consequence, policy and funding have concerned science technology and innovation without consideration for women’s engagement in the middle part of the pyramid. Following the STI Capacity Building Framework, here are several questions about women’s participation that arise.

1. **Education** – To what extent do women advance to tertiary education (including top-level institutions)? What are their roadblocks? How can these be overcome to build capacity?

2. **Research and Development** – How do we ensure not only women’s ideas but women’s participation in R&D for development? How does women’s R&D compare with men’s to broaden innovation? What is lost in not involving women’s perspectives, ideas, and abilities?

3. **Pro-poor Innovation and Technology** – How do we ensure that technology developed to serve women is developed by women, including poor women? How do we gather women’s best ideas and rural knowledge to serve their communities and benefit the women and their families directly, not the external developer?

4. **Technology Transfer** – How do we make technology transfer seamless and educate individuals and organizations that women, as well as men, are excellent entrepreneurs for taking technologies to market? How do we tap the thousands of women globally with engineering degrees and expertise who are unemployed because of their gender to build high tech businesses to serve their countries’ unique needs?

5. **Enterprise Innovation** – How do we develop the infrastructure needed (including incubators, mid-level funding, business education, networks of support, mentors, and role models) that will empower women at the middle of the pyramid to grow innovative businesses?
6. **Making STI Policy** – How do we move gender from the margins to the mainstream so that policy makers do not minimize the issue but work side by side with the experts to truly build capacity among the missing middle? This requires funding for research, program implementation, and evaluation. Gender can no longer be part of small projects, but a component of every mainstream issue.

The United States was able to build real economic wealth in the 1970s though 2007 in part because of the development and infusion of technology. What is not often considered is the mass infusion of women into tertiary education, the US workforce, and top level leadership due to the passage of Title IX and other legislative efforts. The growth of women’s support networks (Society of Women Engineers, National Association of Women Business Owners, the Association for the Advancement of University Women, among many others) has significantly influenced women’s capacity to benefit from and add value to the STI economy. Organizations like the National Science Foundation have put in place meaningful and enforceable requirements for broadening participation in the US that addresses women as well as other under-represented groups, with impressive outcomes. Policy is where it all began. Without strong leadership and belief in women as essential for true capacity building, there can be little movement in either women’s participation at the middle of the pyramid or socioeconomic or STI development overall.

**Improving the STI Partnership Document**

The STI Partnership document highlights several features that are critical to the success of any global initiative. The following elements that have great importance for women are lacking:

1. Expertise related to health, education, and agricultural issues from women is overlooked due to their absence or the use of a select few women repeatedly to represent all women, which may create competition and minimize the knowledge base.
2. There is limited provision for evaluation due to lack of training and low requirements, making continuous improvement a challenge and sustainability impossible.
3. Lack of supportive infrastructure for sustainability, including an understanding that chambers of commerce tend to represent and support men; funding for business development targets men at the middle of the pyramid, leaving women at the micro level and unable to build beyond; and gender inequities are difficult for women to overcome individually without networks of support and mentoring for addressing the challenges.
MDWIT RECOMMENDATIONS

Based on the assumptions outlined in the document, MDWIT makes the following recommendations:

1. To generate new world knowledge via R&D, women’s engagement through tertiary education, research labs, and entrepreneurship potentially offers the fastest means for developing countries to (a) identify ways to adapt new technologies for their own use and (b) develop software and hardware to address unique needs.

2. To build STI institutions in developing countries, organizations need to partner with women’s organizations and make an exerted effort to welcome women into mainstream STI efforts to ensure they benefit from their ideas and potential in STI. The Forum need only look to examples in South Africa where MDWIT, in partnership with the Innovation Hub and Meridian International, developed women as technology entrepreneurs. This small but powerful group of women has formed their own internal network having failed to find support in the country.

3. MDWIT supports the point that R&D capacity building is necessary but not sufficient and highlights the need for a unique forum among mainstream stakeholders to develop in detail what this means for all people.

4. Science and technology and production are not connected and efforts to integrate them are on-going. Because this is such a challenge, bringing up issues of gender becomes even more remote when in fact it is a critical factor for success as women are both consumers and users of what is produced. Their input into the design and development of S&T as well as production could enhance the value of the connection and the production value itself.

PARTNERSHIPS: FINAL THOUGHTS

MDWIT has four guiding principles that may well serve the Forum as additional elements for consideration:

- Partnerships with individuals and organizations are central to all targeted initiatives.
- All development and investment priorities must be measured and aligned to specific objectives.
- Lessons learned are leveraged by disseminating materials through the website, publications, presentations, and the media.
- The organization is committed to supporting diversity in all initiatives.

Capacity building includes both men and women. Issues of culture, race, disability, age among other factors cannot be adequately addressed with 51% of the STI potential of each country underutilized.

MDWIT stands ready to serve as a consultative partner for policy, research and implementation efforts.