

## PANEL SESSION: THE FUTURE OF THE WINTER SIMULATION CONFERENCE

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### ABSTRACT

The Winter Simulation Conference (WSC) is traditionally known as the most important annual conference serving the discrete event simulation community. The purpose of this panel session is to generate discussion about the nature of WSC in the future and about its future role in the overall simulation community. There are many reasons to do this. It is important to the communities currently served by WSC, critical to the conference itself, and in a broad sense significant to the future of simulation itself. In keeping with the track theme of discussing the future of simulation, it makes sense to discuss the future of the most important discrete-event simulation event.

## 1 INTRODUCTION

### 1.1 How did we Get Here?

In contemplating the future, one might start by looking backward. Why does WSC exist? Who started it and who kept it going? What market need has been met by this successful conference that is now in its 36<sup>th</sup> incarnation?

The conference has a rich history that has been documented elsewhere (Crain 1992, Wilson 1992). We'll try to

limit the "Ghost of WSC Past" aspect of this session due to time constraints of the panel format.

That said, it may be useful to touch on such topics as observed patterns of researcher, practitioner, and vendor participation; perceived recent trends in the number of invited vs. contributed papers in each track; changes in the cost of attending the conference; and so forth. Panelists who can do so may want to contribute brief insights or summary data in these or other areas.

### 1.2 What is WSC Today?

WSC continues to thrive today despite occasional setbacks over the years. Like many conferences, WSC attracts researchers, practitioners, and vendors. However, the degree of diversity, particularly among presenters and attendees who come from the academic, commercial, and government sectors, may be unusual.

WSC is also somewhat unique among technical conferences in that it is not aligned with a single sponsoring group. Instead the conference is sponsored – meaning owned in the formal sense, financially and structurally – on a shared basis by multiple organizations. The central organizing force of WSC is a Board of Directors comprising representatives of the sponsoring societies. The execution

of each conference is up to a volunteer committee that changes every year, led by a General Chair and a Program Chair. The committee is assisted by paid help that manages labor-intensive aspects such as registration processing and exhibits organization.

Given that background, some questions about “WSC Present” remain that can be addressed, and in fact must be addressed, in order to gain insight into the future role of WSC.

Panelists are encouraged to share their thoughts on any or all of the following topics.

- What is the state of the Winter Simulation Conference today?
- Who really owns the Winter Simulation Conference?
- Who is its core constituency? (Is it the sponsoring societies? People who contribute to the conference year after year? People who attend sporadically? The simulation research and practice communities at large? The for-profit community of software vendors and consultants?)
- What is the mission of the Winter Simulation Conference?

### **1.3 Where is WSC Going?**

In order to generate future-oriented thinking in keeping with the theme of this session and mini-track, panelists are also encouraged to address any or all of the following questions about “WSC Future.”

- By 2013, what might have changed with respect to WSC’s ownership, constituency, and mission?
- How many people will attend the 2013 Winter Simulation Conference? How many of them will be presenters? How many organizations will exhibit?
- How will the makeup of the attendees, presenters, and exhibitors at WSC’13 be different from the present?
- What will have changed about the subject matter covered at the conference?

## **2 JAMES HENRIKSEN, WOLVERINE SOFTWARE CORPORATION**

The Winter Simulation Conference has reached a crossroad. While WSC has enjoyed success as the premier conference for practitioners of discrete-event simulation for 35 years, it faces challenges that threaten its continued existence. In the paragraphs that follow, I’ll give my opinions on past, present, and future.

### **2.1 What are the Strengths that have Contributed to WSC’s 35-Year Longevity?**

WSC is a meeting place that brings together people with diverse interests. People from the academic community, from industry, and governmental/military organizations commingle freely. Users and implementers, neophytes and seasoned experts, theoreticians and practitioners learn from one another. The WSC Exhibit Area provides a venue in which buyers, sellers, and just plain talkers (who neither buy nor sell) can look at currently available software technology. In many cases, users can talk directly to the people who actually implement software features.

Track-based programs allow attendees to focus on their areas of interest. For example, a beginning simulationists can get a quick education by attending only tutorial sessions. Conversely, an expert might be primarily interested in a topic covered in a single session, but also attend other sessions of more casual interest.

WSC’s unique sponsorship by a multiplicity of professional societies (a) assures that WSC reflects a diversity of interests and is not monopolized by any particular group, and (b) provides a source of long-term, stable leadership in the form of WSC’s Board of Directors.

### **2.2 What Problems does WSC Face?**

The longevity of WSC is threatened by economic issues.

The cost of attending WSC has become very high. Registering for the conference, paying for a 3-day hotel stay, round-trip airfare, meals, and other expenses can exceed \$1,500. When the economy is down, and budgets are tight, such expenditures may be hard to justify.

The cost of vendor participation is high enough to exclude some small companies. This is particularly regrettable, because the simulation industry has thrived on contributions made by relatively small companies. The cost of having a booth in the Exhibit Area, hosting a users’ group meeting, and sending several employees to WSC can easily exceed \$5,000, an amount many small companies cannot afford.

Sponsoring societies share in conference profits, but not losses. Every year, the sponsoring societies contribute startup funds to WSC. A budget is formulated, incorporating conference attendance fees that are conservatively set high enough to break even at an expected minimum attendance level. When the conference actually takes place, discretionary expenses are made depending on actual attendance/revenue. If attendance is significantly higher than the break-even number, amenities, e.g., food provided between sessions and at the conference reception, may be upgraded. Any profits realized are returned to the societies. Typically, each conference contributes startup funds to its successor.

When a conference loses money, as was the case in 2002, and the sponsoring societies do not share in the loss; i.e., they are refunded their “front” money in full, the successor conference’s startup funds are reduced, and the conference may have to scramble for funds. In the case of WSC ’03, donations were solicited, and substantial funds were received from companies and individuals.

The debate as to whether a non-profit organization should be formed to provide better long-term financial continuity is at least 20 years old. Recent events should revive the debate.

An overemphasis on form (versus content) of papers has made the burden of preparing a WSC paper quite onerous. Even worse, the rules seem to change every year. As a consequence, some individuals (myself included) are sufficiently turned off that they are reluctant to participate. I’d much rather read a really good paper whose references are improperly formatted than read a structurally impeccable paper of marginal content.

The quality of presentations is lamentably poor. Giving a good presentation is not all that difficult, even for a beginner. The conference needs to provide pressure and assistance to presenters to improve the quality of their presentations. Perhaps the conference could offer a Sunday evening “this is how you do it” hands-on workshop.

There’s no widely accessible post-WSC forum. <http://www.wintersim.org> would be a nice place for hosting reviews, commentaries, rebuttals, etc. for WSC presentations. In the absence of such a forum, once erroneous or even damaging information is published, there’s no way of challenging it. I know of one instance in which a vendor’s software (not my company’s) was incorrectly described in a WSC paper, notwithstanding objections made in advance by the vendor.

I think we could do a better job of attracting first-time attendees. We already have tutorial tracks that go a long way in this direction, but more vigorous promotion might help attract additional attendees.

WSC keynote speeches are more often than not interesting but irrelevant to discrete-event simulation. We need to find keynote speakers who speak our language.

Finally, I would exhort future committees to work very hard at being aware maintaining a balance between tradition and innovation in the structure of the conference. If you throw away all tradition, you risk running into the ground a conference that has thrived for 35 years. On the other hand, if you simply try to replicate last year’s conference, WSC will stagnate. We need to continually try to do new things.

### **3 RICKI INGALLS, OKLAHOMA STATE UNIVERSITY**

My history with the Winter Simulation Conference dates back to the early 80’s. The first three jobs that I left had a

common thread; my employer did not let me attend WSC the previous December. Coincidence? I will never tell.

While I was in industry, WSC was my “conference of choice.” If I could only attend one conference a year, I attended WSC. As a simulation practitioner and theorist, it was clearly the best conference. I always considered the proceedings quality to be good, the presentations to be good, and I also tried to spend several hours going through the exhibits in order to see the leading-edge in the simulation software business. WSC is “old-home week” for me, where I can reconnect with professional friends. I really enjoy WSC.

I cannot say that I have the investment of the other panelists in the conference. I will serve as the 2004 Proceedings Editor, along with Manuel Rossetti of the University of Arkansas. Serving the conference in this capacity is a small payment for what the conference has given to me in my career.

#### **3.1 The Best Things about WSC**

*It is a conference for anyone interested in simulation.* The best thing about WSC is that I have been able to recommend the conference to anyone, from the beginner to the expert, as a place where the person can learn about simulation for the first time or learn about what is state-of-the-art. It is not unusual for me to receive 2 to 3 calls in a year from someone who is trying to learn about simulation, simulation software, applications, or theory. I can recommend WSC to them without reservation. It is that breadth of the conference that I feel is very valuable and should be maintained in the next 10 years.

*It has maintained high quality throughout the years.* The quality of the conference overall has been very good. Since moving into academics in 2000, I have been able to attend a few more conferences. In comparison to WSC, I have found those conferences to be poorly run, especially in the area of papers presented and the quality of the presentations. I recently attended an unnamed conference where more than half of the sessions I attended had a missing speaker. Even in the toughest year of WSC, 2001, almost all of the commitments to present were honored by the authors.

*There are individual people committed to the success of the conference.* Most conferences function because there is a bureaucracy (society) that keeps the momentum going. If you have a society, you must put on conferences. That is just the way that it is. However, WSC functions because there are committed people. These people get appointed to serve on the board and take their turns in volunteer positions for the sake of the conference. This shows that the conference has developed a depth of commitment from a core group of people.

### 3.2 The Big Issues with WSC

*Adapting the conference to the changing application of simulation.* In the early 80's, discrete-event simulation was emerging as an affordable alternative for systems analysis. It was running on the new personal computers and could be used to analyze large systems. Many of the issues around simulation concerned how to get these large systems to be modeled and to run efficiently on these new computers. Many people attended WSC for the first time in the 80's to learn about the use of simulation in their business. The vendors were small simulation software companies who were pioneers in the field.

In the 90's, the industry expanded from delivering simulation software as a package to imbedding simulation into other applications. I applaud the move, since it is logical that simulation is a tool to help solve larger problems. Because of the value of simulation as an embedded technology, many of the small simulation software vendors of the 80's were bought by larger companies whose primary market may have been scheduling, factory control, or some other market. The systems analysis application of simulation did not disappear, but it did stabilize.

This change in application has not been addressed by the conference in any significant way. Let us take simulation-based scheduling as an example. Even though we have tracks for simulation-based scheduling, and we have some vendors who have simulation-based scheduling packages, the target audience are still the people whose primary focus is the simulation itself. If the conference wants to grow, it needs to address this target audience issue.

*From the attendee standpoint, the overall cost of the conference.* WSC has always tried to have a good venue, and I believe at a reasonable conference price. However, the conference price is only a small part of the overall cost of the conference for a person. I believe that the days of loose money are over, so the conference must address its overall costs to the individual and take those issues into account when selecting venues.

*The conference's relationship with its sponsoring agencies.* In my position of 2004 proceedings editor, I have been exposed to the "inner workings" of the conference for the first time. What I have found is both encouraging and frightening. The sponsoring agencies include: American Statistical Association (ASA), Association for Computing Machinery: Special Interest Group on Simulation (ACM/SIGSIM), Institute of Electrical and Electronics Engineers: Computer Society (IEEE/CS), Institute of Electrical and Electronics Engineers: Systems, Man, and Cybernetics Society (IEEE/SMC), Institute for Operations Research and the Management Sciences: College on Simulation (INFORMS-CS), Institute of Industrial Engineers (IIE), National Institute of Standards and Technology (NIST), and The Society for Modeling and Simulation International (SCS). The encouraging part of this mess of ownership is

that many different groups are interested in supporting simulation through WSC. The amount of money put in by the sponsoring agencies is relatively small, and they usually receive all of their money back with profit.

The frightening part is that none of these agencies seem to be particularly devoted to the conference to the point of picking up the pieces if something catastrophic were to happen. The conference's recent financial problems have shown that to be the case.

### 3.3 How the Issues should be Addressed

*We need to figure out how to reach an expanding audience.* The typical user of simulation today is not the typical user of 15 years ago. A typical user of simulation today *may not even know he is using simulation!* How can the conference give value to those people? We need to focus on the applications where simulation may be imbedded and bring those topics to some prominence, both in the proceedings and in the exhibits. We do not need to exclude the traditional topics and vendors, but we do need to expand.

*A little out-of-the-box thinking on conference costs and locations.* The good news is that the WSC board is aware of this issue and is addressing the issue in new contracts and venues. However, the conference needs to look at its current location rotation (Washington, D.C., west coast, southeast) to see if location is contributing to the costs. Also, we need to look for locations that will draw the *families* of the attendees as much as the attendees themselves.

*Conference ownership: The buck stops...* Because of the recent financial problems, Jim Wilson had the idea of the "Patrons of WSC," which solicited donations from individuals for the first time in the conference's history. Many people, myself included, gave money to the cause. The "Patrons" effort has raised over \$25,000 for the conference so it can get over the current financial hurdle. Those donations underscore the commitment of individual people to the conference. My question is, "Do the 'Patrons' have an ownership stake in the conference?"

However, the long-term solution is the most radical solution. WSC needs a new sponsoring agency that is dedicated to discrete-event simulation. In the list of sponsors, none of them are societies that are dedicated to discrete-event simulation as a field. It seems obvious that one should exist. Perhaps the "Patrons" money should be used to help fund a new society!

### 3.4 WSC 2013 – A Picture

If trends continue, the 2013 conference will be held in the Washington, D.C. area. Because of the outrageous costs in Washington, the conference will actually be held in Richmond, Virginia and have 1,200 attendees. The conference will continue to have both introductory and advanced tutorial tracks. The program will continue to focus on discrete-

event simulation. However, two out of every three vendors will be selling systems that imbed simulation. Imbedded simulation will be prominent in the vendor track and have at least one track in the refereed proceedings. The International Journal of Discrete-Event Simulation will be 7 years old and the Society for Discrete-Event Simulation (SDES) will be the sole sponsoring agency for the conference. However, one very important aspect of the conference will remain the same: I will still meet my old(er) friends there.

#### **4 MANI MANIVANNAN, VECTOR SCM**

Over the past several decades, the Winter Simulation Conference (WSC) has been a great forum for hundreds and thousands of researchers, practitioners and vendors. It has brought together people from all over the world to share new research ideas, novel simulation applications, and software technologies. It has provided a unique setting for simulation vendors to demonstrate their services to both seasoned and new users linking the art and science of simulation. It has offered a delightful environment to learn about what is hot and what is not in simulation. Obviously, WSC played a very important role to the community as evidenced by the fact that it had grown up in size with 600 to 850 attendees each year versus a few hundred attendees during 1970s.

The WSC is a very closely knit society and has gone through several economic booms and bust cycles, still providing the intrinsic value to its attendees. Though the fundamental philosophy of WSC in serving its community has stayed the same, the application areas have varied over time to meet the changing times during the past several decades.

As we look back a few years, we certainly cannot ignore some of the underlying transformations that had been taking place in simulation field - in terms of both theory and practice. We have seen several simulation software companies acquired or merged with much larger, multinational companies. There is a growing need to know the impact of software consolidation on the WSC in the years to come. The future roles of WSC could very well be coupled to such transformations.

We have seen the rise and fall of internet and e-commerce sector. On the contrary, we have seen the outburst of web-based technologies revolutionizing the way we communicate and interact between each other. Maybe, the internet is here to stay after all. Once again, these trends may tend to impact the role of WSC to its loyal, diehard conference attendees.

As we move forward, the WSC should continue to bring theory and applications of simulation together. It should continue to operate on the same fundamental philosophies and bylaws established by our forefathers. However, as times are changing with continuous slump in Information Technology (IT) spending, it becomes mandatory for WSC to

evaluate and refine its roles and responsibilities to service its customers for many more decades to come.

One of the WSC roles should involve figuring out the strategic directions for WSC. It should first determine how big the WSC conferences ought to be. Considering the cost, purpose and the affordability factors, it may become crucial for WSC to take a stronger role in continuously enhancing and expanding the program to retain both first-time and loyal attendees as well as attract new participants.

Having said this, in defining its key roles, a five year plan will be essential in identifying and expanding the WSC content, enlarge its user base, and recognize newer application domains beyond the traditional manufacturing, logistics and transportation areas. WSC should consider newly emerging application tracks to incorporate new class of participants. Though everyone will agree that this is evolutionary, some of the new application domains where WSC could play a key role are as follows (list not exhaustive):

- Simulation to support the collaborative supply chain designs,
- Simulation used as an enterprise level decision support technology rather than a stand-alone, specialized tool (Recent trends in mergers and acquisitions of simulation software companies by large corporations may support this role),
- Simulation techniques for aerospace, agriculture, pharmaceutical and bio-technology sectors,
- Simulation techniques in the homeland security beyond the traditional military applications, and
- Simulation in the gaming industry – especially modeling and simulation technologies that works well with 3D handhelds and WIFI devices, etc.

As part of its key mission, WSC should continue to support the advancements in the fundamentals of simulation. WSC may consider shifting its main focus on just discrete-event simulation and make it much broader. When we watch the NASA spacecraft animations, or experience a video game using XBOX, or hear the scientists talk of DNA simulations, it is mind-boggling to think of the potential roles that WSC could play in bringing such popular simulation techniques in a symposium that goes beyond traditional discrete-event simulation.

As the WSC roles expand in the years to come, the simulation focus for the WSC may shift into far reaching domains, perhaps in a radical way - bringing a new generation of simulation paradigms and more faithful participants to WSC beyond our imagination.

#### **5 BARRY NELSON, NORTHWESTERN UNIVERSITY**

Let me start with a little bit of my history with WSC. I first attended the conference in 1983 when I presented a paper in the Introductory Tutorials Track, and I have attended every WSC since that one. In 1987 I was Publicity Chair,

and in subsequent years Track Coordinator, *Proceedings* Editor, Program Chair and now a member of the Board of Directors representing the INFORMS College on Simulation. The opinions expressed here are mostly my own, but I did ask the other Board members for their thoughts on the future of WSC.

### **5.1 Things about WSC that I Think will Stay the Same for the Foreseeable Future**

The conference will continue to have a high-quality *Proceedings*. The *Proceedings* is a nuisance to produce, and the papers can be a pain to write, but it is one of our most critical assets. The *Proceedings* is widely cited and articles from it are used in colleges, universities, industries and government agencies as tutorials, illustrations of applications, and a timely link to the latest research. The *Proceedings* indirectly promotes high-quality presentations, another asset of the conference.

The conference will continue to be broad, with tracks ranging from the most basic introduction to simulation to the very latest research, and from general software descriptions to specific applications. We will continue to have attendees from academia, industry and government, plus vendors displaying their products. And it will continue to be a difficult to make all of these disparate constituencies happy (and we never succeed fully), but it will be worth the effort because, like the *Proceedings*, the depth and breadth of the conference is a key asset.

### **5.2 Things about WSC that I Think will Change in the Foreseeable Future**

The form in which the *Proceedings* is delivered will inevitably change. We have already evolved from paper to CD to the web, but our current *Proceedings* is difficult to read except as hard copy or on a full-size computer screen. Eventually I want to be able to call up, say, Dave Goldman's most recent WSC paper on the screen embedded in my cell phone and have it reflow and reformat in an appropriate way.

Related to the previous point, what constitutes a *Proceedings* paper will certainly expand to include, for instance, audio, video and executable programs.

The conference will do a better job of reaching out to new attendees and new (or potential) simulation users. We will have to do this for our survival as a conference. By the nature of what we do, many attendees come once, find what they need, and never return. Our core group represents only about 2/3 of the attendees, meaning that each year we have to go looking for the other 1/3.

We will have more content that emphasizes the connections between simulation and other solution methodologies, such as scheduling, supply chain/logistics and production control. As simulation is embedded into other

products, as well as being a standalone product, our conference program will reflect that.

The program will include new application areas, although this will happen more slowly than some people will like and it will take years to know which ones will "stick." To add an application area, such as the recent (and apparently successful) addition of financial engineering, takes time. To make it worthwhile for practitioners and researchers to come to the conference they either (a) have to know that there will be a substantial number of papers and talks on their topic; or (b) believe that they will be able to pick up new tools and ideas from outside their immediate area of interest. We have always been strong in (b) because of our tutorial tracks. However, (a) is a "chicken and egg" problem (to get attendees you need papers, to get papers there must be the promise of an audience); a champion is usually required to bring in the papers the first few times.

## **6 CINDY SCHIESS, DESIGN SYSTEMS, INC.**

Over the years, the Winter Simulation Conference has played many roles to the simulation community. The founding organizations allowed the tradition to begin and get on its feet. Simulation software, the use of simulation, and this conference have evolved over the years. This panel discussion should address the topic of where this conference is evolving to.

### **6.1 What is WSC Today?**

The attendance at the Winter Simulation Conference has decreased substantially over the last two years to levels not seen for over ten years according to the attendance records kept for the conference. Much of this can probably be attributed to the state of the economy and political conditions. Most companies are limiting travel and conference budgets.

The ownership of the conference is a very good question. The volunteers from the simulation community chairing the various groups are some of the key owners of this conference. In addition to these are the speakers that take their time to write and present papers and also the vendors that contribute a healthy dollar amount by purchasing exhibit space at the conference and sometimes providing sponsorships. Without these people, there would not be a conference, so I would classify these as the primary owners. In addition are the hundreds of people that attend the conference each year, many of which are faithful attendees and rarely missing a year.

The current mission of the Winter Simulation Conference seems to be to keep the simulation community networked together and to share advances that have been made. These advances are in the forms of the state of the various software packages as well as the ways in which these software packages have been applied. The vendor exhibits pro-

vide a fantastic place for people to keep up to date on all of the leading simulation software products on the market. The presentations provide a great way of finding out how others are applying simulation to solve problems.

## 6.2 Where is WSC Going?

The Winter Simulation Conference needs to evolve in a manner that will make the conference more profitable or sustaining. Based on conversations with current and past committee members, it seems that the last few years have had financial difficulties for various reasons.

As the Winter Simulation Conference advances over the next ten years, the makeup should change to include a heavier concentration on business/government related attendees and presenters. Corporations and Government Agencies are the ones spending the money on software and consulting services. Attendees from these groups entice software vendors and consulting firms to want to exhibit and participate in sponsorships which raise the revenues brought in by the conference. Case study presentations by these groups entice other corporate and government organizations to attend to learn more about how they have been successful using simulation.

## ACKNOWLEDGMENTS

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