SOCIETY OF DECISION PROFESSIONALS
Clarity & Insight for Decisive Action

NEWSLETTER

President's Message
by Eyas Raddad and Jennifer Harrington
("A Candid Conversation b/w the Outgoing and Incoming Presidents" – Eyas & Jenn)

Every spring, the time comes to elect new officers and directors through the SDP Board election. As a result, this provides the opportunity to not only welcome new leadership, but to also acknowledge the contributions and say a heartfelt thank you to those board members whose terms have come to a close. One of those transitions is the role of SDP President and for this issue of the newsletter, we asked Eyas Raddad (the outgoing president, term ends July) and Jennifer Harrington (the incoming president, term starts in July) to share their reflections and perspectives with each other as they complete the handover for the upcoming year.

Jenn: What have you enjoyed the most in your role as President this past year as well as in previous roles serving on the SDP Board?

Eyas: The past year has been quite exhilarating and fulfilling. Engaging our community of decision professionals reminded me of how important our mission is, and of the potential it has to improve organizations, societies and the world. I had the opportunity and privilege to work with some of the most dedicated, inventive, purposeful and capable individuals. Working with the board and engaged members of our community on generating ideas for our collective future growth has been very rewarding.

Eyas: You had the advantage of serving on the board for a significant duration in multiple roles, which afforded you a deeper understanding of where we came from and where we are heading. Reflecting on the journey of maturing our society in the past few years, what excites you the most about where we are and where we are heading?

President's Message, *continued*

Jenn: First and foremost, I am grateful to have been able to serve on the SDP board in multiple roles over the years. It's allowed me to have first-hand experience in seeing and being part of the evolution of the society into where it is today. And today we are in a solid position to grow in multiple ways – our community of decision professionals, our influence with decision-makers, our value-add with adjacent disciplines, and our impact on society as a whole. That's why I am most excited about continuing the efforts to explore these growth opportunities and help set the vision that enables SDP to be the <u>recognized world forum for decision making</u>.

Jenn: Similar to your question to me, what excites you about SDP in the coming years and where do you think we need to either start, continue, or stop focusing our energy on?

Eyas: The methods, practices and use cases of our profession had served us well for decades, but the context in which they are applied has moved with exponential speed. It is timely that we introspect and define our future in the new context. This will necessitate changes for the decision professional and SDP, some of which is clear and others are yet to be defined. It is clear to me that finding avenues for melding decision and data analytics is an imperative, and we are barely scratching the surface there. We also need to find more effective ways to describe who we are and what our value proposition is, and expand our reach and strengthen our brand in orders of magnitude. If we are truly serious about our mission of improving organizations and society, we have to greatly grow our scale. This does not only mean that we grow in direct numbers, but also in how we engage other decision support disciplines. We started this journey a few years ago, we just need to continue with determinism, and get more crisp in direction and invest SDP energy and resources behind the new vision. Finally, we must balance the desire to protect the roots of the discipline with the opportunity to expand the potential through engaging adjacent disciplines through whom we can advance the core principles of quality decision making.

Eyas: If there is ONE thing that you can accomplish in the year of your SDP presidency, what would that be?

Jenn: The one thing I would like to accomplish is expanding the operational capacity and infrastructure to support the potential growth in the coming years. We've made great progress in the last year, and need to continue to do so in this coming year. While it may not be a super exciting goal, I do think it is a critical one to set ourselves up for success as SDP continues on the multi-year transition journey to becoming a larger and broader organization.

President's Message, *continued*

Jenn: What advice would you have for the incoming President and/or new Board members?

Eyas: Perhaps this is where I will lean on the advice and experience I was blessed to receive from my predecessors, which continue to resonate with me. I came to appreciate the wisdom of the SDP's governance structure with a "President Elect " serving a year as the Vice President, which gives the transition ample time to transfer the necessary knowledge, most of which is uncodifiable. It also allows the President and Vice President to have a more collaborative working relationship in leading the society and setting the direction. Previous presidents - Leslie Lippard, Pat Leach, and Jim Driscoll - have all contributed to guide me, and there is a lot I learned from them.

In your year as President, I think that your strength in creating and sustaining working processes, organizational structures and habits, and execution discipline, will be most in need in a year of setting up the society for growth. Lean in on these strengths, and trust your instinct. It will serve you and the society well! Cultivating purpose-driven and effective leaders in our society will also be essential to create momentum and results for the growth, and the President is well positioned to move the needle. If your energy is distributed among these two areas, I think you can make a big difference!

It has been absolutely thrilling to work alongside you and getting to know you in the past couple of years, and I look forward to continuing to work with you in a different capacity.

Member Spotlight: Natalie Worsfold
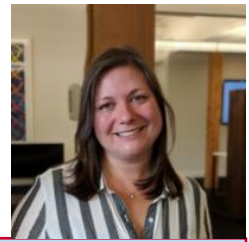
In this newsletter, we take a step into the world of law. If you live long enough, there's a good chance that you or someone you care about will deal with lawyers in litigation. When you do, you will see that those lawyers make judgments all the time that incorporate probability of successful litigation, expected outcome, and (maybe), how much their fees will reduce your potential reward. But they do that in their guts; they do not have the expertise or tools to explicitly expose their assumptions. Natalie Worsfold of Counter Tax Lawyers, a tax litigation firm in Toronto, Ontario, Canada, is on a mission to change that.

Natalie is originally from the UK. After receiving her Bachelor of Laws degree in the UK, she moved to Canada. She started to practice in Toronto and saw litigators without a process, structure, or systematic way to work. She saw litigators working on cases that dragged on for years before they would really bear down on the issues in preparation for a court appearance. She realized that something must change in that model, but she couldn't do it alone. She joined Counter Tax in 2012 and started to co-create a system to deliver better results and clarity along the way. The system has different aspects. Natalie is focused on continuing to integrate DA principles, expertise, and tools into the system. Her mission is to maximize the transparency of the legal thought process. She helps Counter's litigators and clients make smarter litigation decisions.

At Counter Tax, she has developed the software and training to help her fellow litigators think like DAs. Counter's litigators now have formal calibration training, followed by informal bets on everything which helps the litigators calibrate their subjective probabilities.

Their software has the rigor of DA, but that rigor is behind a gentler interface. DA is now in the lifeblood of the system and firm. Even their initial client interviews produce clear reports for clients and litigators. They track their statistics and perform lookbacks, which they publish internally to drive continuous improvement.

They recognize that although the law has standards to apply in a given case, there is still subjectivity, whether reflecting internal litigators, opposing counsel, and judges.

Her DA bible is "Winning at Litigation through Decision Analysis:" by John Celona. She would love to see more lawyers work this way—clients deserve the ability to make informed decisions. The adversarial culture of the legal field is deeply ingrained, but that is shifting, as evidenced by the wider acceptance of mediation.

She is proud of the Tax Court Forecast Report, and other litigation reports she co-created with the team. The Tax Court Forecast Report provides clients with a seven-page, clear document laying out an early case assessment of their cases' strategic choices and probabilities. Their clients love it! The visuals are everything. Words and equations are great, but non-DA humans respond well to visual communication.

Her main hobbies are decision analysis and fluid art paintings, which she describes as "uncertainty and chaos in paint."

Let's all hope that Natalie's work paves the way for a more objective, transparent, and just future for the legal profession.
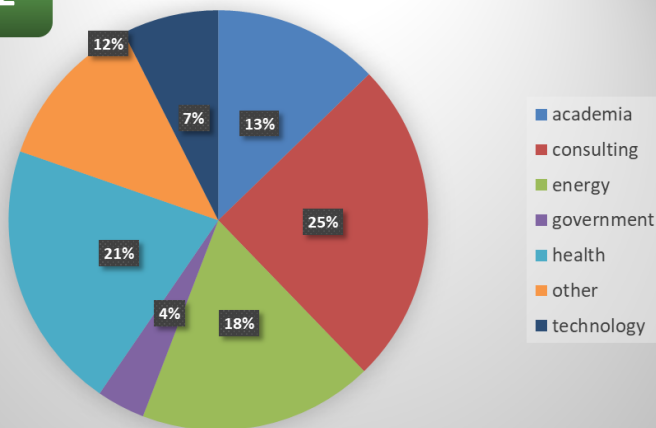
SDP Annual Conference - 2022

Comments from William Leaf Hermann and Gary Summers - Co-Chairs of the Conference

We thank the conference Program and Production Committees, as well as all the speakers and workshop facilitators, for delivering another well-received SDP Annual Conference. Based upon the survey feedback, all elements of the program, both workshops and sessions received high ratings. We have a few observations on the demographic analysis:

- We had a total of 188 conference and workshop participants, almost identical to the number in 2021 (189). The distribution of these participants across sectors was similar to the prior year, with some growth in the number coming from healthcare, offset by fewer representatives from academia. Over half the first-time attendees are in either healthcare (30%) or energy (23%).
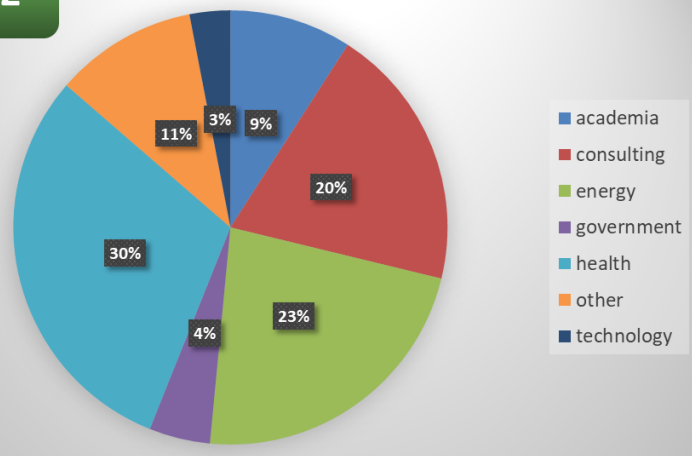

2022

All Attendees
188

First Time Attendees

2022

SDP Annual Conference - 2022

Comments from William Leaf Herman and Gary Summers - Co-Chairs of the Conference

- Participants joined from 16 different countries outside the US, with some concentration in Canada, the UK, and Norway. The geographic distribution was again similar to 2021, but it is interesting to see two participants joining from Japan this year.
- We had over 30 non-members join the conference and/or workshops. We hope a positive experience will convince them to join the Society.

We send heartfelt thanks to all the attendees and look forward to seeing you at next year's conference, **in person, in Houston!**

Conference attendees from the USA
138 in 2022
133 in 2021

Non-US Conference Attendees by Country
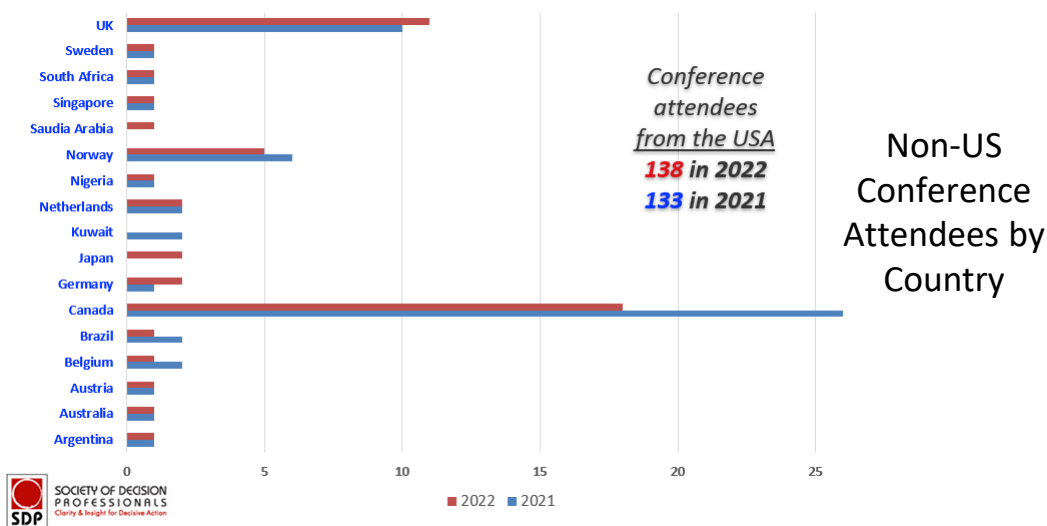
Non-US Conference Attendees by membership type
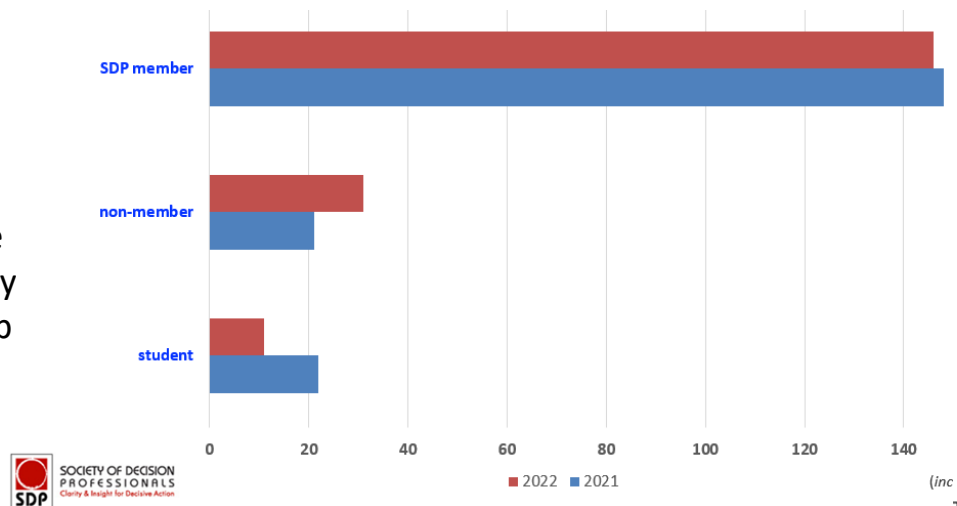
Recently Certified Decision Professionals

Fellows

Hongmei Wang

For over 20 years, Dr. Wang led the development of strategic plans for China Mobile, with Organizational Decision Quality (ODQ) as the core methodology. She led the team training hundreds of people in the ODQ methodology, including many executives who have become senior managers at China Mobile, and this training has, in her words, "directly guided many major decisions of the company." She extended and adapted ODQ to transform many management systems at China Mobile and has received several awards for management innovation. Dr. Wang teaches ODQ as senior lecturer and invited professor. She holds a *Doctorate degree in business administration from Hong Kong Polytechnic University.*

Yong Tao

Dr. Tao is a founding partner of Cloudstone Capital, a VC firm that invests in technology companies across Silicon Valley, US and China. He is currently on the board of several medical device, genomics, semiconductor and green technology companies. Prior to Cloudstone, he founded a decision advisory company (SDR) that provided important decision consulting services to large global and Chinese corporations in mobile communications, automobile, banking and insurance, energy and technology sectors in China for a decade, particularly assisting China Mobile on its long march to develop and implement ODQ. Dr. Tao started his decision career at Silicon Valley with Strategic Decisions Group (SDG) and worked on US, Europe and Japan decision projects for fifteen years. He has taught decision analysis for executives, EMBAs and Finance MBAs in China each year in the last twenty years. Yong Tao obtained his Ph.D. in Decision Analysis from EES (Management Science & Engineering today) at Stanford. He holds a B.E. in Information & Control Engineering from Xi'an Jiaotong University.

Lead Practitioner
Lan Ding

Lan Ding is a Decision Science Director at GSK with over a decade of successful experience in data analytics, forecasting and investment decision analysis across R&D, Supply Chain and Commercial. She is always passionate about applying decision analysis tools and techniques, and improving capabilities of herself, project teams and decision makers to ensure better decision quality.

Recently Certified Decision Professionals (cont'd)

Associates

Scott Evans

Randall Griggs

Darryl Harris

Michelle Wellsbury

Member Article – Earnings and ROCE in a DA Context
by Tony Kenck

In the last newsletter, we threatened to introduce a new feature—a quarterly essay or story about some aspect of Decision Analysis. This marks our first one. It is written by Tony Kenck, a member of the newsletter staff. We wanted to ensure that the process, including online links for discussion, goes smoothly.

Decision and finance training has always stressed the importance of cash flow as a key driver of value. But during down cycles, returns, generally defined as Return on Capital Employed, come to the fore. Return on Capital Employed (ROCE) is typically an annual number defined as earnings divided by capital employed.

It tells stock analysts a few things. The main piece of information extracted from ROCE is whether historical investments are yielding acceptable payouts. I believe it also tells something about future earnings. A large mountain of capital must ultimately be depreciated against earnings, so low ROCE indicates a potential speed bump in future earnings results.

Finance professionals typically start by calculating earnings, then making adjustments to get back to cash flow. That has always seemed backwards to my personal logic. It seems odd to start with a calculated, complex, adjusted value, then derive what actually happened (cash flow). I will start instead with reality—cash flow and talk about how earnings derive from that.

Cash flow is simply net cash in or cash out. Earnings streams in oil and gas have three main temporal adjustments from cash flow:
- deferred vs current taxes,
- depreciation vs capital expenditure, and
- abandonment accrual vs abandonment expenditure.

These adjustments transform the extremes of cash flow into the smoother, averaged view of earnings. Regardless of the detail, always remember that across the full life of a project (or company), earnings must equal cash flow. This is an identity. Earnings are mostly a lagging indicator of performance because of the time shifts in the earnings calculation. Earnings, because they smooth out the peaks and valleys of cash flow, are a better metric for comparing different companies.

Capital employed has a technical, finance definition that brings in sources of financing. For most project purposes capital employed can be replaced by property and plant employed (PPE). It is the undepreciated remnant of capitalized costs. As an example, suppose you spend $1,000 on machinery with a ten-year life. In year 1, $1,000 is on your books as capital employed. After the first year of use, you will record $100 as a depreciation expense (which reduces earnings), and your capital employed will go down by $100. Leaving you with $900 capital employed.

One of the hot topics in petroleum is how to use ROCE in decision-making. I have a few thoughts on that.

(continued on next page)

Member Article – Earnings and ROCE in a DA Context

(continued)

Standard ROCE is calculated every year as an annual backward-looking metric. We can also calculate ROCE by making assumptions about how our standard cash flow models will translate to earnings. The time-series for ROCE is calculable. But then what?

For a project, ROCE normally starts at zero until revenue starts, then increases exponentially as earnings increase and capital employed reduces. In some cases, ROCE flips from approximately infinity to negative infinity before finally ending up at zero again. Abandonment accrual reduces capital employed, so invested capital employed is overwhelmed by the abandonment accrual as an asset approaches its end of life.
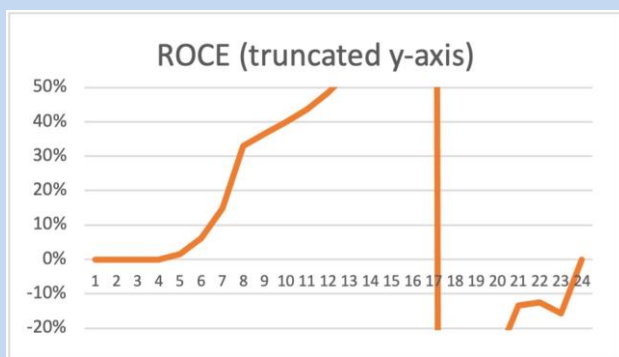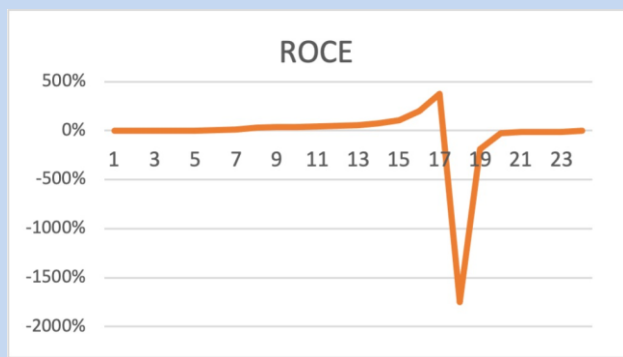
How can all this possibly be useful? ROCE is normally tracked year by year and in a given year it may be anywhere between positive and negative infinity. But there is a simple way to calculate an average ROCE across a project's life. Simply averaging the annual ROCE values is distortionary, but a capital-weighted ROCE is easy to calculate. Simply divide the sum of the earnings across all the years of the project by the sum of the remaining capital employed across all the years of the project.

ROCE is affected by many future decisions and policies. For example, some people do not realize that conservatively (vs aggressively) "booking" hydrocarbon reserves leads to a higher average ROCE across project life, despite a near-term increase by aggressive booking. Different project sizing and phasing may lead to significantly different ROCE results too.

Cash is king. Cash flow discounted at a firm's cost of capital is the most common definition we have of value. At the same time, the world measures and judges our firms based on metrics like earnings and ROCE. So, while NPV will likely remain the major strategic objective function of our investment decisions, decision-makers must be aware of the market impacts of these more tactical but comparable financial metrics.

Please post any comments or questions to SDP's Open Network LinkedIn page.

Council Focus

Program Council:

The Program Council — responsible for identifying content for the SDP Webinar Series — next meets on Friday, July 8 and Friday, August 12. The Webinar Series pipeline is full through October, with a pair of exciting programs on decision-making in entrepreneurial contexts for that month and September. The council is also exploring other presentation formats in addition to typical "lecture-presentation" webinars. SDP members interested in becoming involved in the Council or with ideas for future webinar topics are invited to contact Council Chair Neil Hamlett at neil.hamlett @uncertainty-research.science

Chapters/Outreach Council:

1. *Met at Annual Conference with members of the Council on Friday morning to answer questions about forming local chapters. Had expressions of interest from folks in Chicago and the East Coast.*
2. *SDP members from Nigeria have held a preliminary meeting to explore the formation of the first African chapter.*
3. *The Council will have its next meeting with all chapter representatives on Thursday, June 30th @ 8:00 a.m. CT.*

Membership & Communication Council:

The SDP-supported and guided but individually directed Mentoring Program is underway. If any member is still interested in becoming involved either as a mentor or a mentee, they are invited to send an email to: sdpmentoring@gmail.com. Based on the availability of mentors or mentees with whom to work, we will do our best to pair folks up as quickly as possible.

We are now moving forward with our second initiative of an Internal Group of DA Leaders to offer suggestions when addressing common hurdles in advancing DA within organizations. We will have more to share on this in the next newsletter.

Newsletter Feature Debut

The newsletter team is piloting the new member article feature this month with "Earnings and ROCE in a DA Context." Every newsletter we will publish one- to two-pages of content from members of SDP or external sources of interest. It can be an essay, a case study, a tutorial, an editorial, or a war story. We welcome material from consultants and firms as well, but please no blatant commercialization.

The idea is to learn or teach a technique or perspective. This would be the length of a blog post. The plan is to simultaneously publish the article in the newsletter and a link to a blog or other interactive platform to facilitate discussion and feedback.

If you have the writing bug and have something you want to say, if you are an author and have an excerpt or summary you would like to share, or if you just want to share a professional insight, please consider a contribution to the newsletter.

Please contact Tony Kenck tony@practicalportfoliomanagement.com for submittals or suggestions. We would like to have articles ready to go by August 31.

Chapter News

Vancouver Chapter:
The Vancouver Chapter has continued with steady participation via Zoom, with discussions about facilitation techniques (March) and the application of OECD regulatory principles in government decision-making (May). We also held our first annual book club in April. And, last but not least, we finally met in person in June for a social get-together - very welcome after so many months of virtual meetings.

Houston Chapter:
WOW - What a year for SDP Houston! The chapter hosted a bunch of monthly discussions including "A DQ look at COVID Lockdown Costs and Benefits", "Management Flight Simulators in Business", and "Hope Is Not A Strategy". We also held 2 in-person networking events (despite COVID!), and the highlight of our year, the "Houston Energy DQ Summit" in November.

We would like to sincerely thank all our committee members and volunteers for the 2021/22 year: Ray Spence, Jeremy Walker, Alfred Idem, Ellen Coopersmith, Ashley Corso, Colin Bower, Jim Spanier, Lindsay Oyola, Matt Distel, Carol Liffman, Christa Roemkens, Diana Swift, Chris Travis and many others. And of course, the SDP Board of Directors for their ongoing support. It takes a village and without this team, none of our achievements would have been possible.

As we move into the next 12 months, Colin Bower will become our new President and we welcome Jack Neal as Vice President. We also welcome Ruan Swanepoel to the executive committee. It will be another exciting year with Houston hosting the 2023 SDP Annual Conference in March as well as looking forward to more monthly discussions, networking events, and engagement with the Houston community. We would love to hear any suggestions for events, discussions or engagements from our members.

All the best and get ready for 2022/23!
Matt Distel (president 21/22) & Colin Bower (president 22/23)

Houston Chapter Meetings	Date	Time Pacific
Presentation "Fostering Decision Quality (DQ) Through Decision Framing in Major Projects in Shell"		
Houston Chapter Meeting Presentation "Systemic Bias and Decision Quality"	14-Oct	9:30
Houston Chapter - Decision Quality Summit ("D	5-Nov	All day (5:30am-2:30pm)

SDP

Interest Groups

Decision Education Interest Group

Decision Professionals know the value Decision Quality creates in our professional lives. And when we share personal stories, we often hear experiences where powerful tools help someone, we care about facing a difficult situation make a better decision. A single better decision can change a life. Learning to make better decisions is transformational across a lifetime.

SDP's Decision Education Interest Group is working to promote the widespread adoption of Decision Education as part of the general education curriculum. After a successful first year, we are reaching out to the SDP community to invite your participation.

Many Decision Professionals are actively engaged in initiatives that spread decision skills to youth and the public. The Decision Education IG brings everyone together to share knowledge and materials and pursue common goals. In the past year we developed guiding principle, including refining our purpose and vision. We focused initially on grounding our learning with presentations by individuals with experiences working with schools/youth. We also created a repository where all materials are saved for those who join in the future. The year's efforts culminated in a successful session at the SDP Conference highlighting successful models that have been implemented across a variety of age groups.

We aim to be inclusive, welcoming all volunteers and organizations that share our purpose through collaboration, sharing of resources and best practices. On July 20, 2022 at 2:00 PST the group will come together (on Zoom) to explore our direction for the coming year. We hope you will decide to join us in sharing the value of Decision Education. If you are interested in the group, contact Society of Decision Professionals info@decisionprofessionals.com.

Cost and Schedule Interest Group

If you are interested in being a member of the Cost and Schedule Interest Group please contact Society of Decision Professionals info@decisionprofessionals.com.

ESG Interest Group

The SDP Special Interest Group continues to build momentum. Members are beginning to form working teams to tackle problems relevant to decision analysis, including:
1. Understanding the Challenges faced by ESG Decision Makers.
2. Making the Business Case for Sustainability.
3. ESG and Societal Decisions.

If you'd like to find out more about the group or join one of the working teams, please contact Society of Decision Professionals info@decisionprofessionals.com.
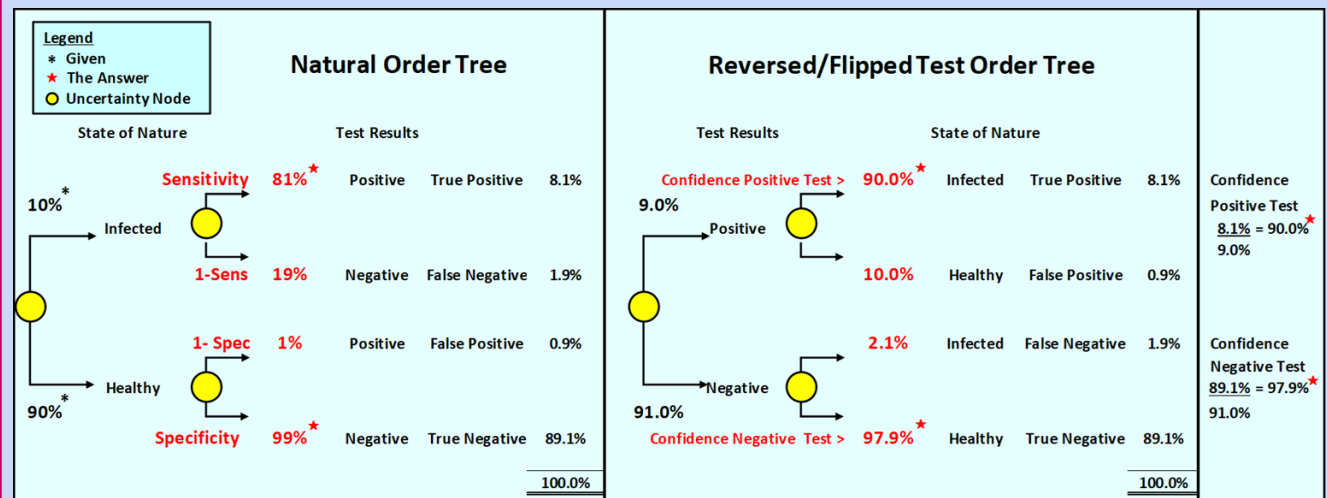
Brain Teaser

The answer to the March Brain Teaser – Click Here or read below

Start off by laying out the decision tree based on the most accurate tests available, namely sensitivity=95% and specificity=99%, they are in natural order and reversed/flipped test order, below.
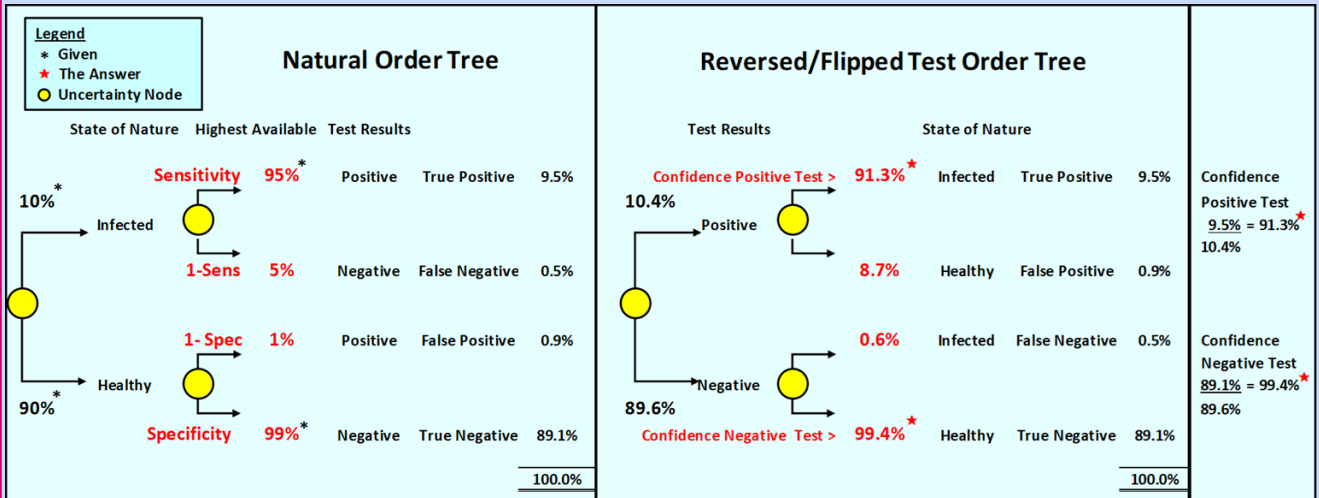
Notice that the confidence numbers of 91% and 99% for positive and negative test results, respectively, are higher than the 90% and 97.5% agreed with the VP. That means you can achieve the VP's goal and have some slack based on the best available tests. To determine the exact combination to meet the VP's goal you can do some trial and error with the sensitivity and specificity. Quickly you will notice that the specificity is too critical and cannot be reduced. So you keep the specificity at 99% and determine the sensitivity can be reduced to 81% to match the VP's goal.

The learning is that "specificity" can be just as critical and possibly even more critical than "sensitivity" for disease testing and testing in general. The solution tree is shown below.

Do you know of upcoming professional events that might be of interest to other SDP members? If so, please email the SDP newsletter at newsletter@decisionprofessionals.com

Brain Teaser - Continued

THE JULY BRAIN TEASER

*Instructions: You can win "bragging rights" by being the first to submit the correct answer of this brain teaser to the newsletter editors (**SDP Newsletter: Brain Teaser**). We will announce the winner in the next issue. Our new Brain Teaser Editor is Tony Fernandez.*

Lalaland Power Grid: This country has been merrily oblivious to the energy challenges around the world, blessed with a very stable economy and reliable sources of energy and power generation for many decades, without the need to add renewables. Their power generation grid has been fine with a 20% reserve margin, but their power generation fleet is aging with many plants about to reach useful life. They are under pressure to reduce nuclear and fossil fuels internally and from the international community. It's decision time and they are evaluating four alternatives: 1.) replace aging plants like-for-like per current state; 2.) add 20% wind and 20% solar, while eliminating coal and decreasing nuclear and natural gas; 3.) same as Alt 2 but increasing reserve margin to achieve 100% ability to meet demand load; 4.) similar to Alt 2 keeping reserve margin at 20%, while equally enhancing wind and solar beyond desired 20% to achieve 100% ability to meet demand load.

To help Lalaland evaluate alternatives, your job is to estimate the ability to meet demand load Alt 2 and capacity additions for Alts 3 and 4, essentially: A, B and C per table below. Also summarize the key learning in "one sentence" no more the 50 words.

Note: As you can imagine electric grids are highly complex, but the objective of this Brain Teaser is to keep it simple and not get very technical. Capacity factor is defined as plant actual energy delivery, relative to plant running at full installed capacity all the time. This teaser is intended as a pencil and paper exercise, or simple Excel. You can simulate if you wish, but it is not the intent.

Good luck!

Lalaland Power Grid — **Installed Capacity Expressed as Percent of Demand Load**

SDP Brain Teaser Jun-2022

Generation Type	Intended Operations	Generation Capacity Factor	Performance Limiting Factor	Alt 1 Today's State	Alt 2 Future Desired State	Alt 3 Future Desired w/Enhanced Reserve	Alt 4 Future Desired w/Enhanced Wind & Solar
Nuclear	Base Load	95%	Mechanical	25%	20%	20%	20%
Natural Gas	Base Load	90%	Mechanical	25%	15%	15%	15%
Coal	Base Load	85%	Mechanical	25%	0%	0%	0%
Hydro	Base Load	80%	Seasonal	25%	25%	25%	25%
Wind	As Available	30%	Wind Speed	0%	20%	20%	C
Solar	As Available	30%	Night / Cloud Cover	0%	20%	20%	C
Reserve	Peaking	100%	Assume Infallible	20%	20%	B	20%
Total Capacity				120%	120%	100% + B	80% + 2C
System Ability to Meet Demand Load				100%	A	100%	100%

Do you know of upcoming professional events that might be of interest to other SDP members? If so, please email the SDP newsletter at newsletter@decisionprofessionals.com

S|D|G
Strategic Decisions Group

Strategic Decisions Group: Insight. Innovation. Impact.

As charter sponsor of the Society of Decision Professionals, **Strategic Decisions Group** (SDG) shares SDP's mission to create greater value for enterprises, individuals, and society through decision science.

In keeping with SDP's conference theme of The Frontiers of Decision Making, SDG continues a 40+ year tradition of supporting important, complex decisions with leading-edge applications.

A Calculus of Sacrifice: In June, the *Harvard Business Review* published "How to Make Strategic Trade-Offs," an article by CEO Mark Seidler and Engagement Manager Florian Methling, both of SDG, and their co-author Rüdiger von Nitzsch, chair of the Decision Theory and Financial Services Group at RWTH Aachen University. The article describes how CEOs and other leaders can create a "calculus of sacrifice" that assigns weighting to conflicting objectives—resulting in clear guidance and a specific formula for making trade-offs among competing objectives.

SDG has long incorporated multiple criteria into its application of decision quality and decision science in client organizations. The fact that these complex trade-offs are trending in nearly every sector is indicative of the increasing complexity of the corporate and social environment.

Decide Like a True Leader: The firm is finding new channels for thought leadership. This year, SDG introduced Decide Like a True Leader, a podcast featuring episodes that cover decision quality, challenges in the energy transition and life sciences, DQ as a leadership instrument, and the path to organizational decision quality.

Some of these topics have been covered by our long-standing webinar series. The latest in our Energy Transition Webinar Series addressed navigating energy transition decisions, taking its place alongside earlier webinars on value metrics, framing, and the social cost of carbon.

We showcased recent work in life sciences with our webinars on early stage portfolio decision making as well as portfolio strategy and management, where we explored the risks of using real-time portfolio management tools to guide strategic decisions.

We're Hiring! SDG is looking for consultants with life science experience to work in the Boston region. Please reach out to Ms. Aarti Dewan at adewan@sdg.com if you're interested in applying.

SDP

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SIMPLE IS NOT ALWAYS CORRECT

Occam's razor is a problem-solving principle that can be interpreted as stating among competing hypotheses, the one with the fewest assumptions should be selected.

This has often been shortened to "All things being equal, the simplest explanation wins". The problem rests with the general application of the second part of this statement with disregard to the first. Only if a more complex explanation and the simple explanation work equally well, does this apply. If a more complex explanation describes the solution more completely, then we cannot assume the premise and choose the simple one.

Scientists get this. Scientists use the principle as a tool to create alternatives rather than the decision method to select the correct answer. However, the public and "common knowledge" has reduced this to a misapplication bordering on an old wives' tale.

I believe this has happened because we have systematically lost our ability for critical thinking. Throughout school we are taught rote facts and shortcuts to learn or making decisions (such as Occam's razor), all in an attempt to compress as much knowledge into our brains in a limited amount of time. We've forgotten how to think for ourselves and create our own answers.

Some recent examples:

A.   I overheard a customer in a big box store shopping for a water heater. She lived alone in a small house and was looking at a 40-gallon model. The salesman quickly pointed out that a bathtub holds more than 40 gallons and you need a larger model to have plenty of hot water. She took his comment as fact and bought a larger heater.

B.   After tornados wrecked a school in a small Oklahoma town, the town council was asked why they chose not to build shelters prior to the disaster. They responded that they had done studies and the chance of a tornado hitting their town on any given day was less than 1%.

C.   A friend wanted to dig a 1-acre pond, 12 feet deep in his spare time. He had a front loader and was filling a 7-yard dump truck to move the dirt to an area 200 yards away.

I'll leave you to ponder these for a bit while we explore some techniques to support critical thinking.

1. Never assume something can "never happen". Often times we wish away bad outcomes by assuming the worst is impossible. $100 oil was thought to be impossible at one time, as $20 oil was only a few years ago. Even if you believe the possibility is very low, explore what can happen to your business/strategy/life if the "impossible" occurs.
2. Extrapolate past event to find one (but not the most likely) alternative. Relying on only the past events as an indicator for the future guarantees you will have surprises. Yet people often extrapolate a growth trend to numbers larger than can be supported (such as world population) or a downward trend all the way to zero.
3. Use Analogues to test your forecast. "We've never built this new technology before, but it's similar to this other technology that performs like this, so it is reasonable to expect results somewhat like before".
4. Test the extremes. What if we doubled or tripled our efforts through technology, manpower, or brute force? What if we lost 80% of our ability to operate because of workforce changes or business interruption? Put numbers to these test cases to avoid the appearance of simply arm waving.
5. If facts are missing, estimate the math with rounding to get the quick answer in your head. (try this on the third example above - no need to use a calculator)
6. Employ linear thinking. The creative side of our brain wants to jump to conclusions or accept other's conclusions as facts to quickly move to the next thing. Slowing ourselves down to think linearly - mapping a stepwise progression of event-

So let's check some of the logic for the three earlier examples.

A. A 40-gallon water heater makes 40 gallons of 120-degree water. Unless you fancy yourself a lobster, you would probably mix it with cold water. So really, it can fill a 70-80 gallon bathtub. Plus, the person in the tub displaces some of the water too. The store stocks lots of 40-gallon water heaters - someone is buying them - if not a single person living alone, as in the example, then who? ***Bottom line, the 40-gallon heater would have been fine.***

B. The risk isn't that there's a tornado on a given day, it's the risk that there's a tornado over the lifetime of using the shelter. Would you ever use it? If not, then don't bother building one. However, with even a 0.5% chance of a tornado on a given day, if we assume a 3 month tornado season and the shelter would be in service for 10 years (900 days of risk) it turns out there's a 98.9% chance there would be one or more tornados during that time, with a 78% chance a tornado hits during an 8 hour school day during the three months over 10 years. ***Plenty of reason to build shelters.***

C. And the pond? Assume an acre is about 45,000 square feet. 1 yard is 9 square feet, but round that 10. So 45,000/10 says an acre is about 4,500 square yards. 12 feet deep is 4 yards, so the volume is roughly 4,500 x 4 or 18,000 cubic yards. Some areas of the pond are shallower, so let's reduce the volume to 15,000 cubic yards for estimating in our heads. The dump truck is 7 yards. So 15,000 yards at 7 yards per load is roughly 2000 loads. He has to load, drive 200 yards and spread the dirt - maybe 4 trips per hour. 2,000/4 is about 500 hours. 50 10-hour days. - if nothing breaks, no rain, and no rest. Assuming working at most 3 days/week, 4 to 6 months is not an impossible range. ***Better get some larger equipment.***

LET'S PONDER THIS

Challenge the assumptions, think for yourself, and do the math. I welcome your thoughts and insights.

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