How to see and communicate the future:
Briefings and analytic assessments

PPHS 614, 30 January 2024

Andrew Bresnahan, MD, BA, MSc, MPH, FRCGS

McGill

Declaration of competing interests

- *Public servant. This scholarly work is not intended to represent the views of the Government of Canada or any other actor.*

Learning objectives

1. Develop an approach to delivering briefings, briefing notes, and analytic assessment products;
2. Enhance your approach to analytic assessment, including familiarisation with the SEES model;
3. Increase your familiarity with Bayesian inference as a tool for probability assessment;
4. Consider how better information design can improve your briefing materials.


EXIT SORTIE

Scenario

You are tasked to synthesise ten sources into a two-page briefing note, and verbally present it to support a decision-maker.

- How much time do you think you would need?
- How much time do you think you would need?
- How comfortable would you be if…?

Six questions about briefings…

Why?

Who?

What?

Where?

When?

How?

Thinking strategically

Ends, ways, means:

- Ends are defined by policy, informed by politics.
- Ways are defined by strategy, in the service of policy, supported by means.
- Means are the resources for the ways to the ends.

Strategy is the bridge between ends and means.

Ask: Given my position, what is my work?

Consider: Courageous advice, loyal implementation.

An approach to Briefing Notes

- What attributes do you notice?
- Strengths? Weaknesses?
- For what is a BN best suited?
- Challenges in writing a good BN?

Organisation Name
Department [identify from what team this note comes]
Briefing Note [1-2 pages maximum]
Date [always include]

Title:
[short phrase identifying the subject of the briefing note]

Summary:

- [**Statement** on the issue, 1-2 sentences maximum.]
- [**Background** information, 1-2 sentences maximum.]
- [Summary of analysis in **Considerations**, 1-2 sentences maximum.]
- [Summary of options, 1-2 sentences maximum]
- [Summary of analysis in **Next Steps/Recommendations**, 1-2 sentences maximum.]

Background:
[2-3 paragraphs offering historical and conceptual information the reader needs to understand the analysis offered in *Considerations.* Provides situational awareness of what is happening now, and explains why we see what we do.]

Considerations:
[2-3 paragraphs to analyse the issue, outlining assumptions, options, pros/cons, risk assessment, of option(s) advised in *Recommendations*. Estimates how events may unfold under different assumptions, and provides notice of future challenges.]

Recommendations:

- [Actions the author advises decision-maker(s) reading this Briefing Note take.]

Next Steps:

- [Actions the author and their team plan to take to support decision-maker(s) in pursuit of the actions described in *Recommendations*.]

What does good analytic assessment look like?

- **Relevant**: Are my arguments relevant for decision-making? (“So what?”)
- **Brief:** Is my assessment as short as it can be effectively?
- **Specific**: Have I indicated who/what/where/where/why/how?
- **Clear**: Have I used direct and declarative language, where indicated?
- **Qualified**: Is my evidence sound, well sourced, compelling, and fit for purpose?

Structured analytic techniques

- Getting organised:
  - checklists, sorting, ranking, etc.
- Exploration:
  - Network analysis, nominal grouping, Circleboarding, starbursting, cluster brainstorming, mapping, Venn analysis, etc.
- Diagnostic:
  - DDx, analysis of competing hypothesis, argument mapping, deception detection, etc.
- Reframing:
  - Red teaming, outside-In, Dephi method, High impact/low probability analysis, pre-mortem, structured self-critique;
- Foresight:
  - Reversing assumptions, uncertainties finder, “what if? analysis”; cone of plausibility, alternative futures, counterfactual, etc.
- Decision-support:
  - Critical path analysis, SWOT, decision tree/matrix, etc.

Heuer, Richards., Pherson, Randolph. *Structured Analytic Techniques,* London: SAGE, 2021.

Analytic assessment: The SEES Model

- **Situational awareness** of what is happening and what we face now;
- **Explanation** of why we are seeing what we do and the motivations of those involved;
- **Estimates** and forecasts of how events may unfold under different assumptions;
- **Strategic notice** of future issues that may come to challenge us in the longer term.

David Omand, "Reflections on Intelligence Analysts and Policymakers", *International Journal of Intelligence and Counterintelligence*, 33 (2020): 471-482.

How Spies Think: Ten Lessons in Intelligence. London: Viking, 2020.

"Written evidence submitted by Professor Sir David Omand GCB", Intelligence and Security Committee of Parliament, UK. 2021. Available: https://committees.parliament.uk/writtenevidence/22563/pdf/

Seeing the future: Speaking of probability

- **Predictions**: Assert the occurrence of some event with certainty.
- **Forecasts**: Statement of probability with a certain degree of certainty.
- **Estimates**: Analysis of a situation, development, or trend that identifies its major elements, interprets significance, and appraises possible outcomes of actions that might be taken.

$$P(H \mid E) = \frac{P(H) \cdot P(E \mid H)}{P(E)}$$

Table 1. Definitions of Degrees of Belief

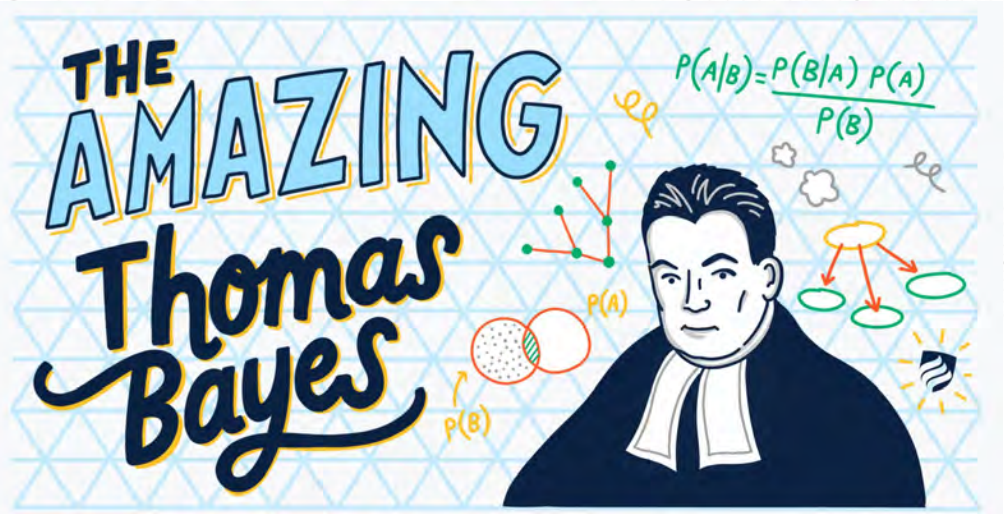
Description	Degree of Belief as a Probability Expressed as a Percentage
Almost no chance	1–5
Very unlikely	5–20
Unlikely	20–45
Roughly even chance	45–55
Likely	55–80
Very likely	80–95
Almost certain	95–99

Goldman, Jan. *Words of Intelligence: A Dictionary. Oxford: The Scarecrow Press, 2006.*

Bayesian inference

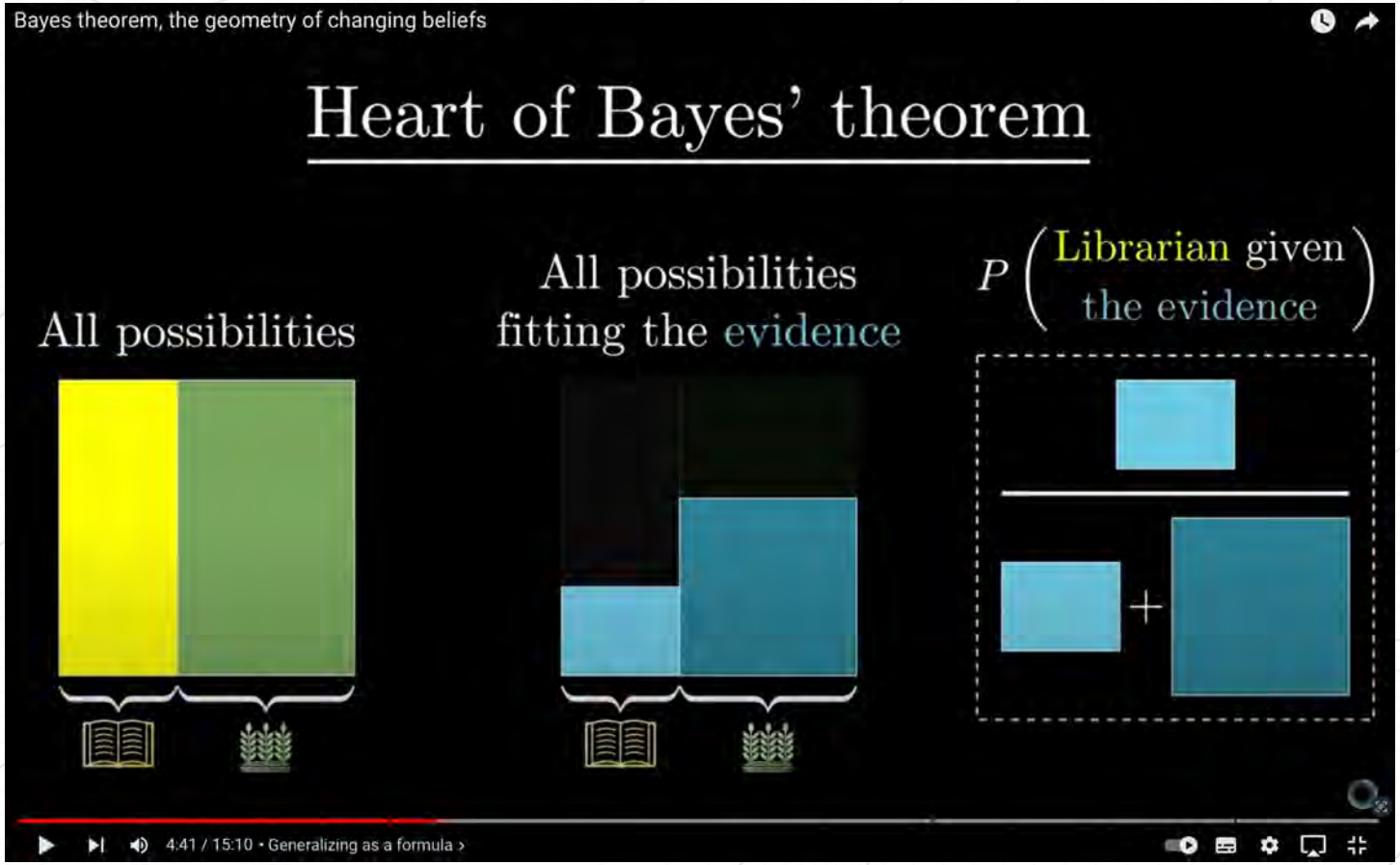
- Bayes' theorem is a way of quantifying how new evidence changes our degree of belief about the situation we face.
- $P(H \mid E)$ is the probability of a hypothesis "*H*" given observed evidence "*E*" (i.e. posterior probability)
  - i.e. updating the probability of an event being true (e.g. a pt has a disease) with new information (e.g. the results of a test).
- New evidence may inspire us to generate *alternative hypotheses* of what an outcome may be.
- Probability is the study of uncertainty using the math of proportions.

$$P(H \mid E) = \frac{P(H) \cdot P(E \mid H)}{P(E)}$$



Omand, David. *How Spies Think: Ten Lessons in Intelligence.* London: Viking, 2020: 24.

Bayes' theorem: The geometry of changing beliefs



https://www.youtube.com/watch?v=HZGCoVF3YvM

Bayes' formula & disease testing

- Disease prevalence *is* prior (or pre-test) probability.
- The evidence is the test sensitivity P (T+|D+) and specificity P (T-|D-).
- Posterior probability $P(H \mid E)$ is the positive predictive value P (D+|T+), ie. the inverse of negative predictive value P (D-|T-).

$$PPV = P(D+|\mathrm{T}+) = \frac{P(D+) \cdot P(T+ \mid D+)}{P(T+)}$$

Table 1 Probability table for disease testing

	Disease present (D^+)	Disease absent (D^-)
Test positive (T^+)	$P(T^+\|D^+)$ Probability of a positive test given the presence of disease Sensitivity	$P(T^+\|D^-)$ Probability of a positive test given the absence of disease 1−specificity
Test negative (T^-)	$P(T^-\|D^+)$ Probability of a negative test given the presence of disease 1−sensitivity	$P(T^-\|D)$ Probability of a negative test given the absence of disease specificity

Table 2 Probability table for disease testing with prior probability (prevalence) included

	Disease present (D^+)	Disease absent (D^-)	Totals
Test positive (T^+)	$P(D^+)\times P(T^+\|D^+)$ prevalence×sensitivity	$P(D^-)\times P(T^+\|D^-)$ (1−prevalence)× (1−specificity)	$P(D^+)\times P(T^+\|D^+)+P(D^-)\times P(T^+\|D^-)$ prevalence×sensitivity+(1−prevalence)×(1−specificity)
Test negative (T^-)	$P(D^+)\times P(T^-\|D^+)$ prevalence×(1−sensitivity)	$P(D^-)\times P(T^-\|D)$ (1−prevalence)×specificity	$P(D^+)\times P(T^-\|D^+)+P(D^-)\times P(T^-\|D)$ prevalence×(1−sensitivity)+(1−prevalence)×specificity

Webb, M.P.K., Sidebotham, D. "Bayes' formula: A powerful but counterintuitive tool for medical decision-making. *BJA Educ.* 20 no. 6 (2020): 208-213.
Sidebotham, D. "Are most randomised trials in anasethesia and critical care wrong? An analysis using Bayes' theorem. *Aneasethesia*, 75 (2020): 1284-88.

Probability and risk

- Risk is the probability of the occurrence of an event or outcome.
- “Rationality is not about knowing facts,
  It’s about knowing which facts are relevant.”
- Understanding probability helps us communicate risk, both quantitatively and qualitatively.
- Probability focuses our consideration of all possibilities, given the evidence, to better inform of understanding in what is likely to be true.

Information design in risk communication

- How might an interdisciplinary lens be beneficial in communicating public health information to decision-makers?
- To what extent are epidemiology and intelligence analysis similar?
- What can public health and national security learn from each other? (Same question, other fields?)

INTELLIGENCE AND NATIONAL SECURITY
2019, VOL. 34, NO. 5, 703–726
https://doi.org/10.1080/02684527.2019.1592841

Routledge
Taylor & Francis Group

ARTICLE

Handling and communicating intelligence information: a conceptual, historical and information design analysis

David Lonsdale and Maria dos Santos Lonsdale

ABSTRACT

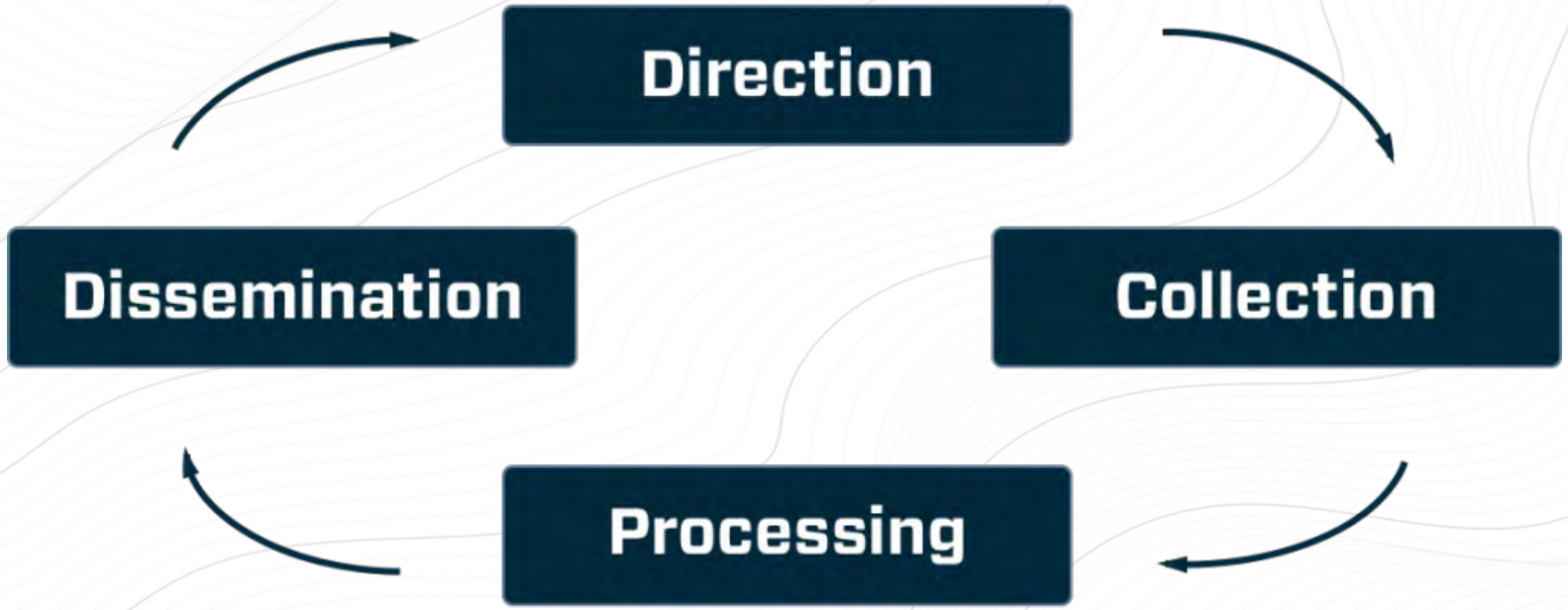
Effective communication of information is essential to intelligence work. This paper identifies the main obstacles to good communication: policy-related challenges; cognitive impediments; resource limitations; cultural and structural issues within intelligence communities; and technical information. To illustrate, it examines four cases when poor communication contributed to intelligence shortcomings. Via questionnaire and document survey, the study identifies the current state of practice in UK intelligence communities. The survey of visualization documents currently in use revealed errors against established principles of Information Design. Thus, to ensure better handling and dissemination of intelligence, there is a distinct need to apply Information Design principles.

1. Introduction

'The process of relaying intelligence can distort its meaning.'[1]

It seems self-evident to write that intelligence is about information. Nonetheless, it is important to emphasize that the latter is integral to every stage of the Intelligence Cycle. The process of national security intelligence is about knowing what information you need, how to collect it, how to analyse it, and finally how to communicate it to those who use it in support of decision-making. In the words of James S. Major, a forty-year veteran of intelligence, 'In intelligence work, information is our life's blood.'[2]

The Intelligence Cycle



Hulnick, Arthur. “What’s wrong with the Intelligence Cycle?”, *Intelligence and National Security*, 21 no. 6, 2006: 959-979.

"The process of relaying intelligence can distort its meaning"

- Impediments:
  - limited resources, time pressure, scale, complexity, organisational structure and culture, cognitive biases, lack of engagement by decision-makers.
- Lonsdale and Lonsdale study:
  - Method: visual survey of documents communicating resource allocation decisions, including "systematic analysis of the graphic and typographic features of a document."
  - Participants: 30 people with management responsibilities in UK intelligence.
  - Objective: "to ascertain how much information respondents deal with, how it is presented to them, whether…in a clear and effective manner, and how easy is it to make use of the information."

Betts, R. K. "Surprise despite warning: Why sudden attacks succeed." Political Science Quarterly 95 (1980-1): 555.

Lonsdale, David., Lonsdale, Maria dos Santos. "Handling and communicating intelligence information: A conceptual, historical, and information design analysis. *Intelligence and National Security.* 34 no. 5 (2019): 703.

greyscale warning

Information design principles in UK intelligence

General	Text
• Uncluttered • Simple and easily accessible • Consistency across infographics • Clear contrast between elements • Information clearly organized • Clear visual hierarchy • Generous margins • Aesthetically pleasant • Design principles applied • Target users considered • Tested with target users	• Maximum 2 clearly different typefaces • Bold used sparingly for emphasis • No underlining used for emphasis • No Italic used for descriptive text • Title is dominant and clear • Clear contrast between text elements • Good interword space (and no rivers) • Left aligned text (not right, nor centered) • All-capitals only for short headings • 9-12pt font size • 60–70 characters per text line • 1–4 extra points interlinear space • Sanserif bold type on color background • Sans serif for digital and small size type • Effective direct labelling • Text not inclined on labels • Concise labels

Lonsdale, David., Lonsdale, Maria dos Santos. "Handling and communicating intelligence information: A conceptual, historical, and information design analysis. *Intelligence and National Security.* 34 no. 5 (2019): 705.

Information design, continued

Graphics	Color
• Graphics used effectively • Graphics adequately arranged • Arrows provide direction effectively • Icons used to make data clearer	• 3 colors for infographics • 3–5 colors for coding w/equal strength • 2–3 colors for charts • Contrast between text and background • Color groups pieces of information • Color helps to scan information • Color signals relationships • Color used sparingly for emphasis • Color used harmoniously • No highly saturated (primary) colors • Only colors that can be named are used • Color used consistently • Color contrast used for coding • Soft colors used for charts

Lonsdale, David., Lonsdale, Maria dos Santos. "Handling and communicating intelligence information: A conceptual, historical, and information design analysis. *Intelligence and National Security.* 34 no. 5 (2019): 705.

Information design, continued

Layout	Tables
• Layout in zigzag form • Grid used to organize information • Information well organized • Clear hierarchy • Good spread of white space overall • Good space around graphic elements • Good space around headings and text • Few and effective alignment of elements • Headings aligned in the same axes	• Tables fade to background • White space used instead of borders • Light rules (and borders if used) • Light filling colors used • Background does not alternate per row • Grid lines not used for every entry

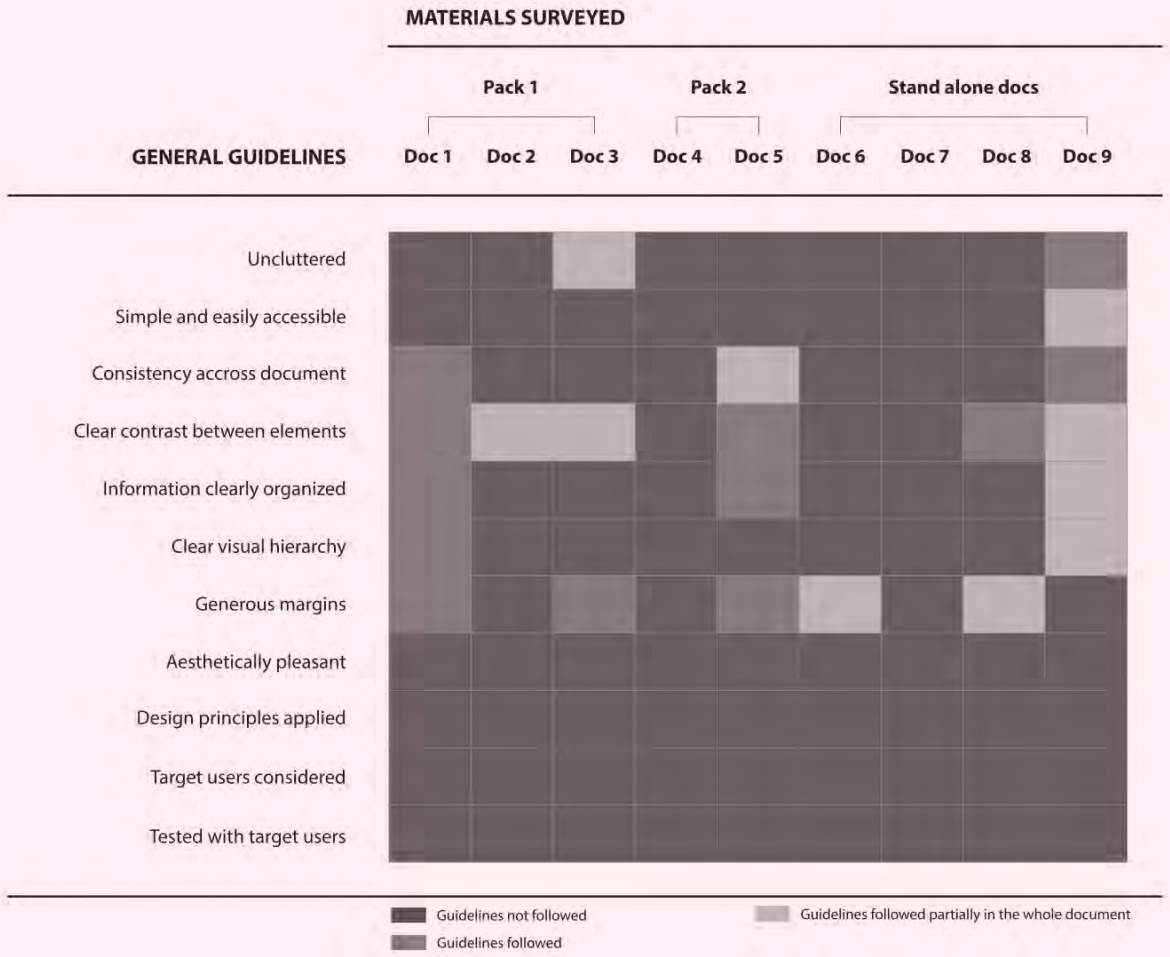
Lonsdale, David., Lonsdale, Maria dos Santos. "Handling and communicating intelligence information: A conceptual, historical, and information design analysis. *Intelligence and National Security.* 34 no. 5 (2019): 705.

Information design, continued

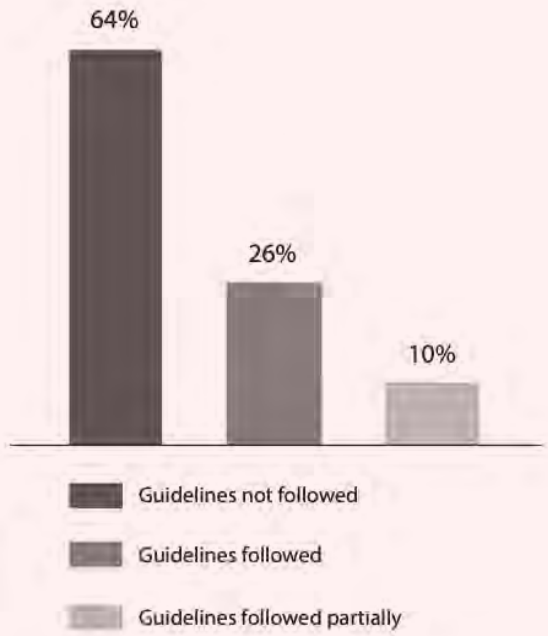
Pie/donut chats	Bubble charts
• Chart accompanied by text • Effective direct labelling • Multiple donut charts avoided • Sum of parts equals 100% • No more than five segments • No further segmenting within a slice • Segments displayed clockwise • Donut chart used to show total value	• Effective at giving general sense • Effective at comparing different values • Visualization proportional to real data • Labels inside bubbles are effective • Outside labels clear and close to bubble • Colors for each category clearly distinct • Semi-transparent overlapped bubbles

Lonsdale, David., Lonsdale, Maria dos Santos. "Handling and communicating intelligence information: A conceptual, historical, and information design analysis. *Intelligence and National Security.* 34 no. 5 (2019): 705.

To what extent are these guidelines followed?



"The results show that overall, the documents fail to communicate and visualize information in an effective manner."



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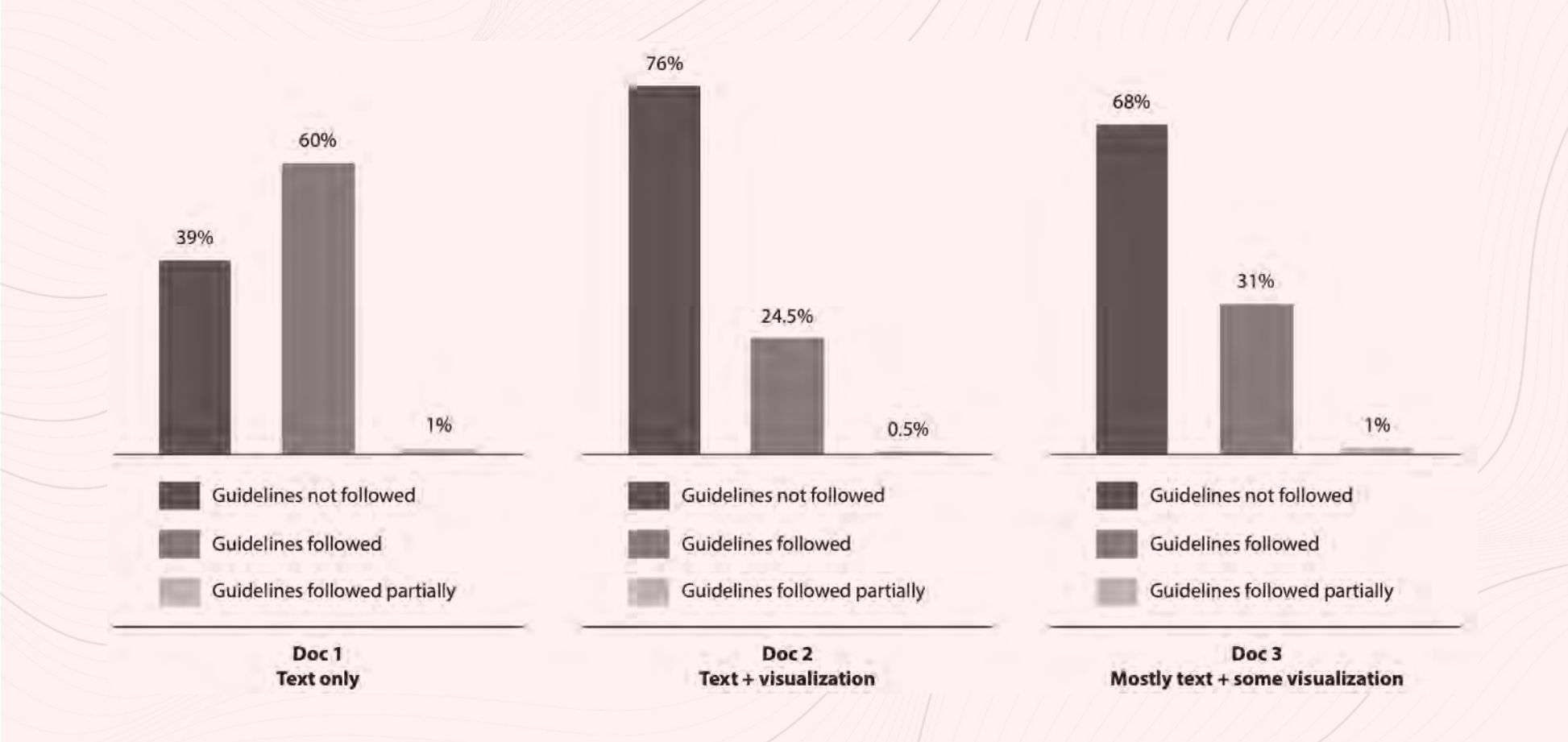
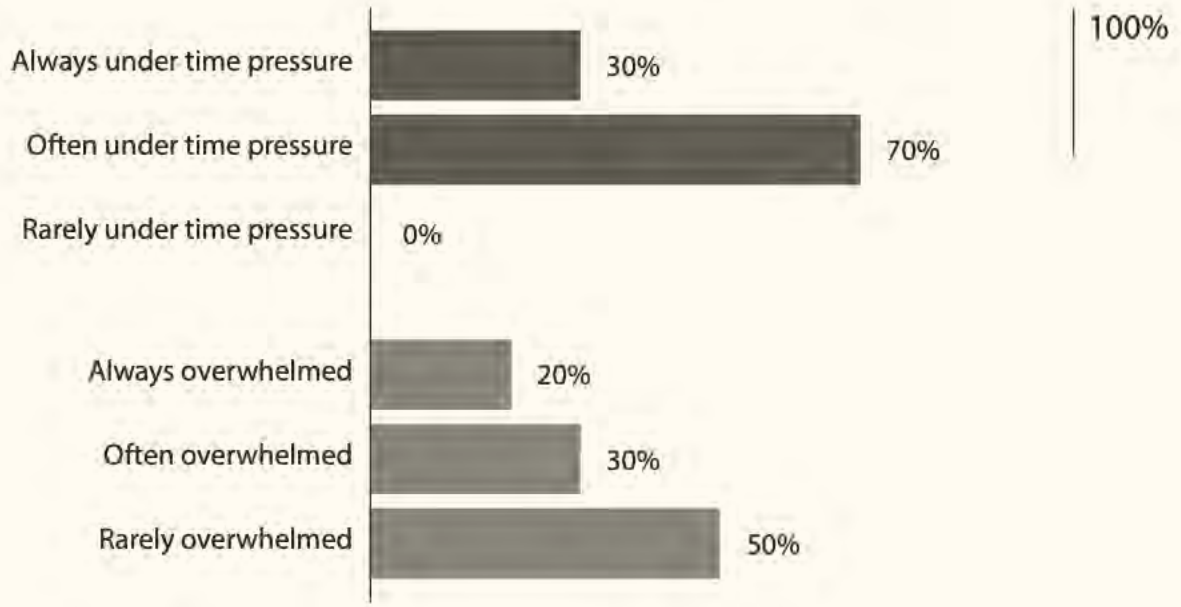


Time pressure and overwhelm

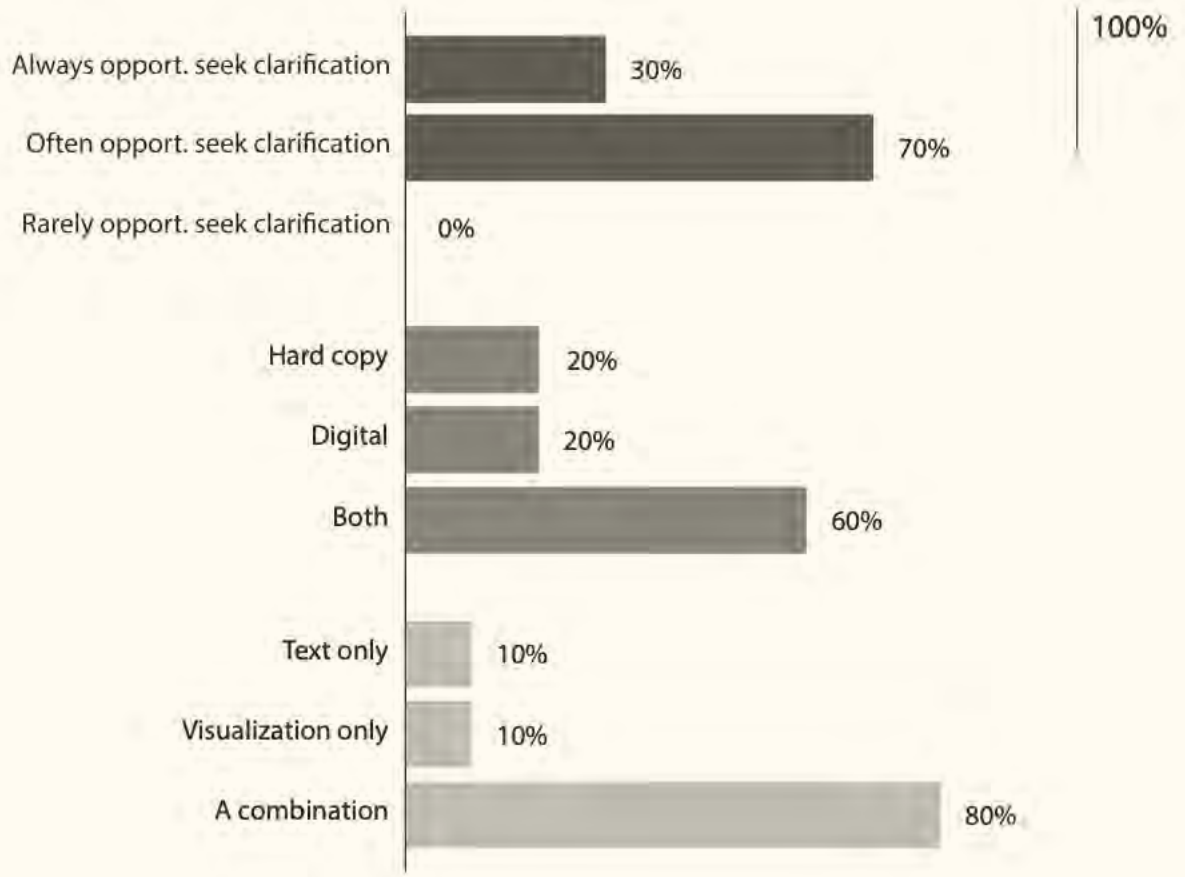
“Do your read the information documents under some time pressure?”

“Do you ever feel overwhelmed by the amount of information in the documents you receive?”



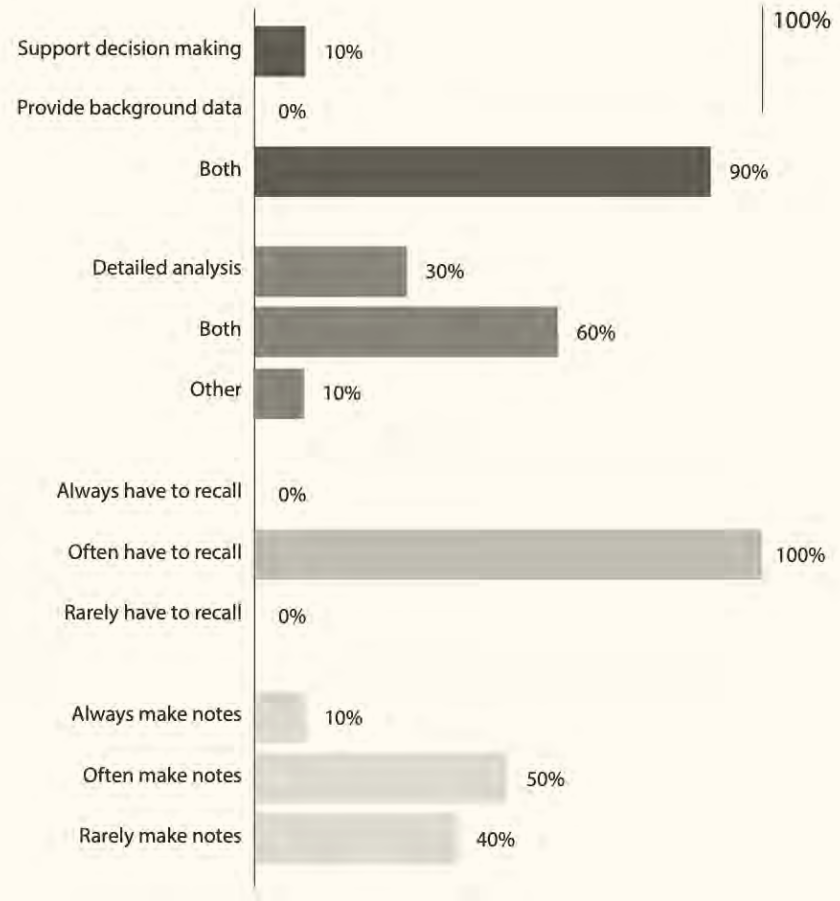
Opportunity for clarification? Format?

- “Do you have the opportunity to ask questions and/or seek clarification on the information you receive?”
- “Do you prefer a hard copy of the document, a digital version, or both?
- “Would you prefer the information be presented as text only, visualisation only, or a combination of both?



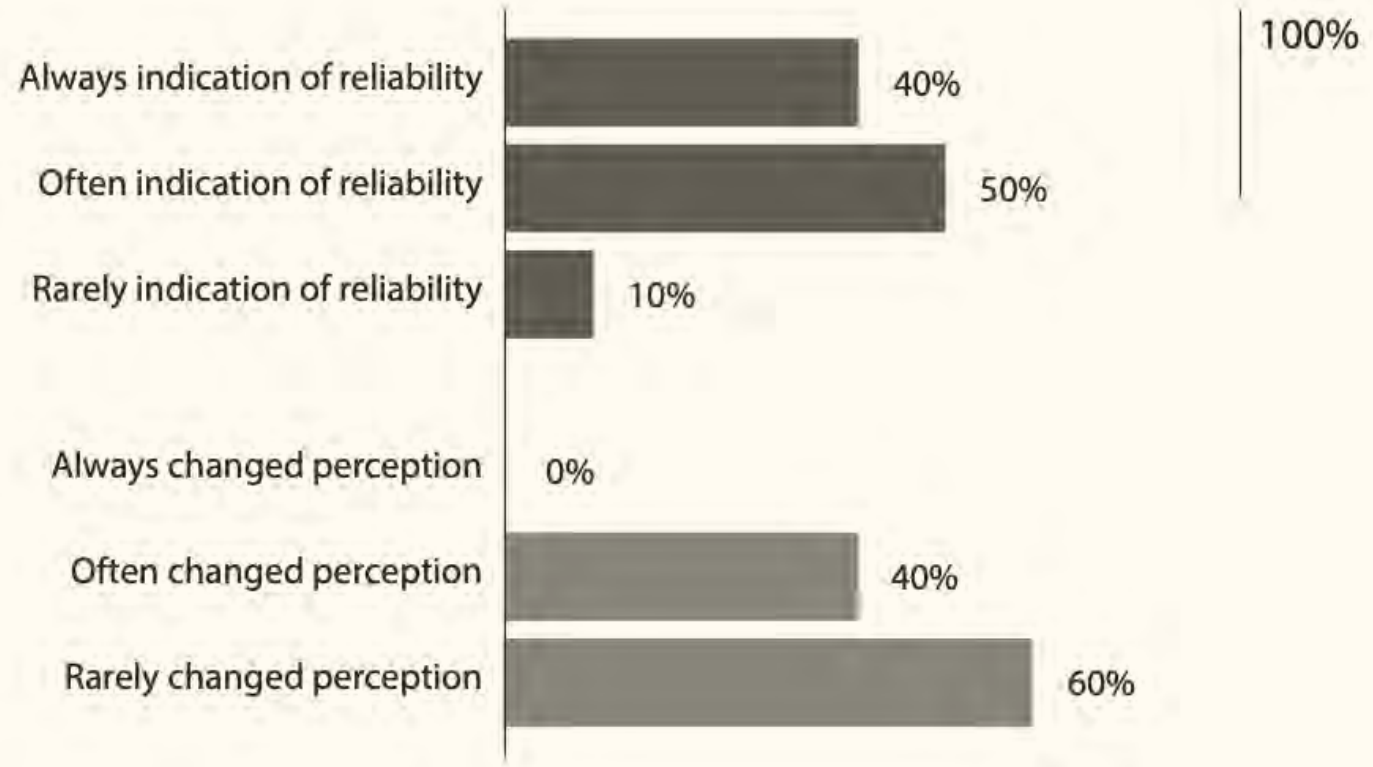
Use, needs, recall, room for note taking?

- “Do the information documents you receive support decision making, provide background data, or both?”
- “In your role, do you need raw data, detailed analysis, or both?”
- “Do you need to recall the information in the documents at a later date?”
- “Do you make notes on the document?”



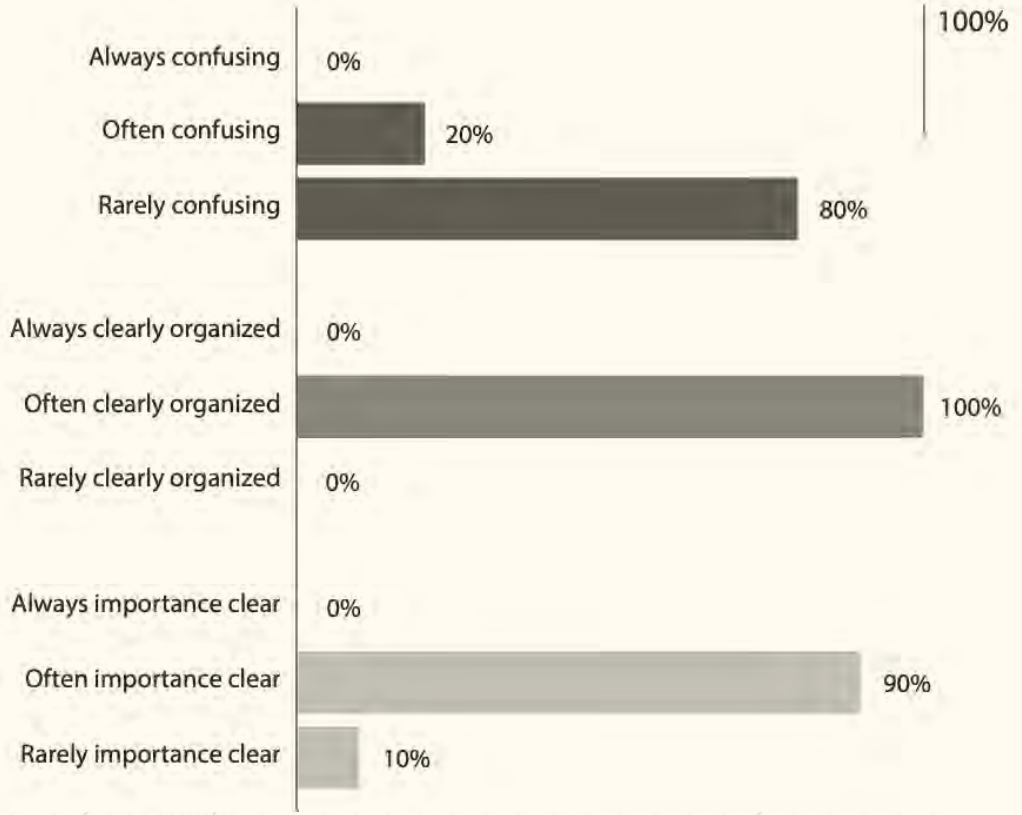
Reliability? Change?

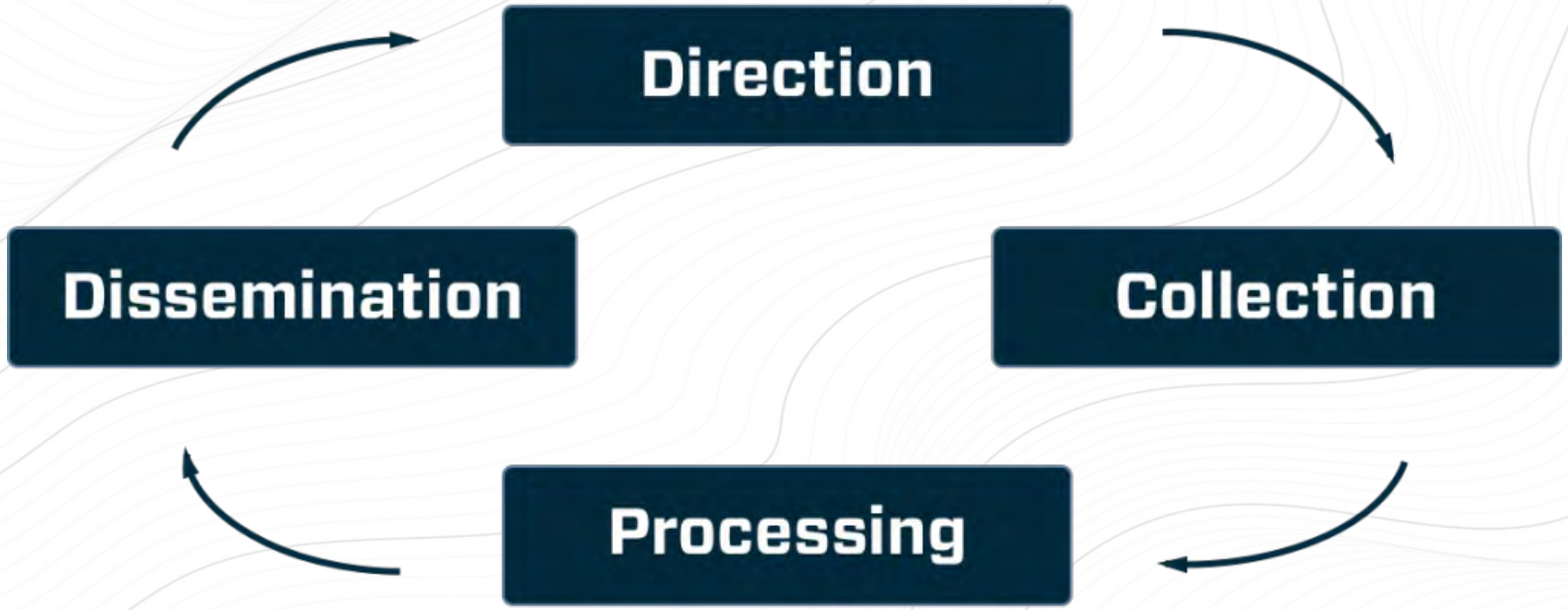
- “Does the information in the documents include an indication of its reliability?”
- “Overall, has the way information is presented in the document ever radically changed your perception of an issue?”



Confusing? Clear? Relevant?

- “Overall, do you ever find the way information is presented in the documents confusing or unclear?”
- “Overall, is the information organised clearly on the document page?”
- Overall, is the importance of the information always clear? ***(i.e. so what?)***




Direction
Collection
Processing
Dissemination

Thinking strategically

Ends, ways, means:

- Ends are defined by policy, informed by politics.
- Ways are defined by strategy, in the service of policy, supported by means.
- Means are the resources for the ways to the ends.

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Ask: Given my position, what is my work?

Consider: Courageous advice, loyal implementation.

What is my work?

Thanks / Merci / Qujannamiik!

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