IQC 02
The Consulting Life Cycle

Contents

The Consulting Life Cycle

1. **Marketing**
   getting the word out
2. **Initial contact**
   open discussions with prospective client
3. **First meeting (and meetings)**
   commitment to writing a proposal
4. **Assembling a team**
   montage scene
5. **Proposal and Planning**
   lays out what can be done for client
6. **Contracting, Insurance, IP**
   don’t start work until this is cleared up
7. **Information gathering**
   may include data collection and cleaning
8. **Analysis**
   where quantitative skills come in to play
9. **Interpretation of results**
   what the client actually cares about
10. **Reporting**
    usually the final deliverable
11. **Invoicing**
    in order to get paid
12. **Closing the file**
    onto newer and greater things?

Marketing

Marketing is required to let **prospective** clients know that you:

- Are in business, as a consultant
- Have a certain set of qualifications
- Are looking for projects

There are **numerous** marketing approaches:

- word-of-mouth
- online
- event
- newsletter
- article
- content
- niche
- reverse
- etc.

Not all methods will be applicable to you and your context.

Marketing

If prospective clients do not know that you exist, they cannot find you (analogy with dating: **you have to put yourself out there**).

Marketing is anything and everything done by a consultant in order to **legitimately “**get an in” with a prospective client and to convince them to hire their services.

Consulting firms typically have marketing teams (individuals dedicated to finding clients and projects).

Marketing

In smaller firms, marketing is often done by the consultants **themselves**. Individual consultants may also join with other consultants to avoid duplicating efforts and to minimize costs.

Marketing avenues are constantly changing with the advent of new technologies (**stay up-to-date** – a principled stand against a new tech may garner support in an echo chamber, but it can also mark you as an **out-of-touch dinosaur**).

Good marketing is necessary, but not sufficient, for consulting success.

Marketing

When selecting a marketing vehicle, these are questions to ask:

- does it give a consultant an “in”?
- can it convince a client?
- what is its cost (time, financially, energy)?
- what is its initial vs. on-going investment?
- what are the risks associated with it?
- are there universal guidelines to the approach?

What works for one project, one client, one consultant may not work for another – **beware the tyranny of past success**!

Marketing Materials

You should explore a **number** of the following avenues:

- current and customizable project-based CVs*
- client testimonials (letters of reference, etc.)
- portfolio (online, offline), including personal and *pro bono* projects
- social media presence*
- updated and functional website
- blog articles/white papers on variety of topics
- brochures and business cards
- attending conferences and networking activities
- adverts
- etc.

Project-Based CV

2 main sections:

- **Traditional CV** (contact info, skills, selected achievements, relevant experience, education and personal development, personal)
- **Relevant Project Experience** (list, role, project description, related reports and presentations)

Other items can be added, depending on the context (publications, teaching, etc.)

The traditional section should be no more than 4 pages long (note the suggested section **order**). You may want to include project in different domains to showcase successes & breadth.

Social Media Presence

Platforms:

- LinkedIn (consider accepting invites from people you don't know, expand your network, **post regularly**)
- twitter (RT articles/posts of interest, **with a commentary**; get to know who the experts in the fields are and follow them; post regularly)
- what about facebook, instagram, etc?

With an online presence, there might be a need to separate your **personal** identity from your **professional** identity.

Learn to avoid the common pitfalls of online use (trolling, flame wars, lousy/generational spelling, etc.)

How will you address the (potential) differences between your business social media needs and your personal ones?

Blog Articles

Purposes:

- content aggregation
- interacting with community
- pushing content
- showcasing communication, technical skills & interests

These are not journal articles – **communication is key**.

If you are going to base an article off of a project, make sure you get **client permission** first.

Initial Contact

If a prospective client expresses interest (no matter how faint):

- immediately dedicate a **project number**, an **email folder**, and a **folder in your file structure** to the potential project
- capture & verify **email addresses** and **phone numbers** ASAP
- respond to advances **promptly** (without seeming too desperate)
- show interest in the project, even if the subject matter is not to your liking or if you are not an expert on the required methods
- never turn down clients at this initial stage because you are not interested in the work or because you feel unable to do it (invoke lack of availability or suggest other lead)

Goal: set-up a face-to-face meeting to discuss project in detail

First Meeting with the Client

If you have a meeting space, the client can come to you

- make sure that a **private** space is available, with **wi-fi connectivity**, plenty of electrical outlets, projectors, water/coffee, A/C or ventilation in the summer, etc.

If you do not, secure a shared meeting space or simply offer to go to them (that should be your first choice, as a courtesy)

- bring a laptop computer (with battery pack or electrical cord)
- bring identification
- go to the bathroom before you enter the client's office
- **DO NOT BE TARDY!** Arrive 15 minutes early; scope the parking/busing situation
- dress appropriately (business, business casual?)

Either way, have (e-)business cards/marketing material on hand

First Meeting with the Client

Don’t forego niceties (eye contact) and small talk – you are being gauged as a human being as well as a technical expert.

The interview goes both ways.

Let the client take the lead in describing their **situation** and **needs**

- Take notes (or have an assistant take notes)
- If you do not understand something (acronym, specifics to their industry or company, etc.), don’t hesitate to ask for clarification
- **DO NOT INTERRUPT THE CLIENT!** Wait for a lull or a natural point in the conversation to make contributions and show that you understand their needs and the underlying situation
- The first meeting is not about the consultant (or at least, very little of it is) – you should listen more than talk.

First Meeting with the Client

You may be asked to provide solutions on the spot – **DON'T**. **NEVER** commit to the project, to a price, or to a timeline at the initial meeting.

If pressed, say: "I'm going to bring this information back to my team and we'll evaluate the project's feasibility. You will hear from us within x days/weeks."

Goals: get a sense of the project's **feasibility** and your **suitability** for it; gather information about **data sources** and **quantitative requirements**, and client's understanding of same.

Assembling a Team

Will you be working on this project alone? With a team? What roles are needed on the team? Who is available?

- **solo:** bigger share of revenues for the consultant
- **team:** more available resources, so project can be completed quicker (?)
- **solo:** resource management easier to handle
- **team:** more knowledge/ideas at the team's disposal
- **solo:** no need for team meetings
- **team:** only one person needs to interact with client
- **solo:** latitude in accepting/rejecting projects
- **team:** managing egos and personalities
- **solo:** nobody tells anyone what to do (except for the client, perhaps)
- **team:** psychological strength in numbers (in theory…)

Team Meetings

Once a team has been assembled, you need to plan for **team meetings**. Nobody likes those, but they are crucial to success.

Goals: make sure the project is on track; exchange vital info between teammates (changes to the work plan, new discoveries by other members, etc.); keep team lead abreast of progress. Remember – **your teammates depend on you and your work!**

Designated meeting lead should prepare an agenda and stick to it; team meetings can easily become **time sucks**.

Proposals

If the project is deemed feasible, the proposal is the **foundation** of its eventual success – it is the opening line in the negotiation with the client.

Goals: let the client know what you understand of the problem at hand, what you will do for them, and what you expect in return.

One of the biggest challenges facing consultants is how to gauge the value of the service they offer – **we tend to sell ourselves short**. The proposal helps justify our $$$ demands to the client. It also helps limit what is known as **scope creep**.

Proposals

A proposal should read as a **letter** to the prospective client. Its content may change depending on the specifics of each project, but the following topics should figure in the final document:

- Background
- Objective and Scope
- Methodology
- Milestones and Deliverables
- Schedule and Assumptions
- Resources and Costs
- Travel
- Invoicing
- Appendix – Suggested Workplan
- Appendix – List of Former Relevant Projects and Clients
- Appendix – CVs and short bios
- Appendix – Other Services Offering

Proposals

Background

- introduction
- state what you understand of the client's organization (research this)

Objective and Scope

- state what you understand of the client's problem (go back to client to clarify if needed)
- delimit your tasks (we will do …., we will not attempt to …); the client may require options

Methodology

- suggest a series of steps / methods that you will follow (see samples); the idea is to show the client that you have already started thinking about their problem
- add caveat that the data will ultimately be driving what method is used

Milestones and Deliverables

- explicitly list the important steps and deliverables you will produce for the client (prototype, final report, weekly progress reports, dashboard, executable code, etc.)

Proposals

Schedules and Assumptions

- provide a timeline for the milestones and deliverables, assuming that an agreement is reached by a certain date, or that the data is available by a certain date, etc.
- use **relative** dates if the client has deliverables for the project as well (better to err on the side of caution and deliver on time below cost than the other way around!)
- establish the project authority on both the client and the consultant sides

Resources and Costs

- list the resources that will be assigned to the project, with a short justification to reassure the client that the consultants are qualified to work on their project
- list the projected cost for each option (referring to the workplan as needed), with HST info
- reassure the client that they will not need to pay for work that was not done
- state that if more work needs to be done due to a change of scope or issues with data quality or something other client issue (**never call it a client error!**), you will wait until you have client approval before you start the new work (**communication with the client is crucial!**)

Proposals

Travel and Invoicing

- state what traveling costs will be charged to the client and that more expensive jaunts will only be undertaken with the client's approval
- state your invoicing policy (monthly/at milestones/upon completion, etc.)

Suggested Workplan

- provide a table with tasks and steps (follow the methodology), expected time expenditure and corresponding costs, as well as timelines
- produce a total estimate for the project (don't forget the tax information)

Credentials and Credibility

- add a list of previous clients for references
- add project-based CVs and short bios of team members
- add a list of other services offered by your team

After the Proposal

Deliver the proposal within the deadline you have provided. Now, the **client dance** starts…

Clients do not know (nor do they need to know)**:**

- how busy the consultants are
- how many projects they have on the go
- how many proposals are up in the air

Consultants do not know:

- the project's priority for the client
- the procurement challenges
- if multiple proposals were requested from different consultants

After the Proposal

You have given them a deadline to respond in order to guarantee the availability of your resources.

- If they respond in time, then you move on to fine-tuning the proposal
- If they respond after your deadline, then you need to reassess the situation
- If they don't respond, you can decide to poke them or to let them go

Remember the **dating analogy** – sometimes the client dance is a negotiation tactic, but sometimes they're just not that into you.

How desperate are you to get a project? How flexible are you? Can you afford to wait? Can you afford not to get the right terms?

Contracting

After some back and forth, a proposal might be approved – **IT IS NOT A LEGAL DOCUMENT**.

Never start work on a project until a legal contract has been signed by both parties. Some organizations insist on using their own contracts – some negotiation is possible, but they are not always willing to budge. **NEVER SIGN A CONTRACT THAT YOU DO NOT UNDERSTAND OR AGREE WITH**.

WARNING: I am not a lawyer; neither are you. Get legal advice from actual lawyers. Please.

Contracting

My contract template (which I never use “as is”) contains a number of clauses, distributed in the following sections:

- Identification of parties
- Acknowledgement of Processes by Parties
- Definitions
- Charges
- Term
- Conditions
- Payment
- Materials
- Confidential Information
- Warranties and Liability
- Force Majeure
- Termination
- Notices
- Conflict Between Documents
- Dispute Resolutions
- Waiver
- No Permanent Relationship
- Unenforceable Provisions
- Governing Law and Jurisdiction
- Singular and Plural
- Headings
- Amendment
- Language
- Fax and Counterparts
- Signatures

Insurance

From the client's perspective, a consulting project only has 3 possible outcomes ("A+", "A-", "F"):

- consultants **exceed** their expectations (managed with the proposal and open communication)
- consultants **meet** their expectations
- consultants **fail to meet** their expectations

Given an "F", the best case scenario is that the client will send future projects to other consultants. The worst case scenario is that the consultants did not meet their **contractual obligations**, opening them to legal action.

Professional insurance against this (inevitability?) is a must.

Intellectual Property

Who owns the **results** of a consulting project? Most reasonable parties would conclude that it is the **client**; and non-disclosure agreements (NDAs) are often required before a contract can be enacted.

Who owns the **methodology**? The **approach**? Can consultants re-use code for another project or publish the methods?

In the same vein, can an individual consultant use a method she developed as part of a team for her own work?

Intellectual Property

Can mathematical/statistical/analytical work be patented or made **proprietary**?

This might seem like a frivolous question to ask at this stage, but take the time to figure out the answers with your team and with the client. This could save you a lot of difficulties down the road.

Goal: make the consulting job as simple as possible by removing the focus on anything but the quantitative analysis.

Project Planning

Start planning the project **before** agreement is finalized

Goal: meet the project deadline without killing yourself in the process, so better to hit the ground running!

Prepare a timeline for **tasks/deliverables**, incorporating

- teammates' (and external resources') availability, projected delays, client bottlenecks, unexpected turns, holidays, client deadlines, simultaneous projects, work-life balance, etc.

Hofstadter's Law:

- "It always take longer than you think, even when you take Hofstadter's Law into account"
- revisit plan periodically when preparing progress reports (internal and external)

Information Gathering

In the proposal, the consultants have “demonstrated” an understanding of the client’s organization and of the project.

Now comes the time to **actually try to understand**, through

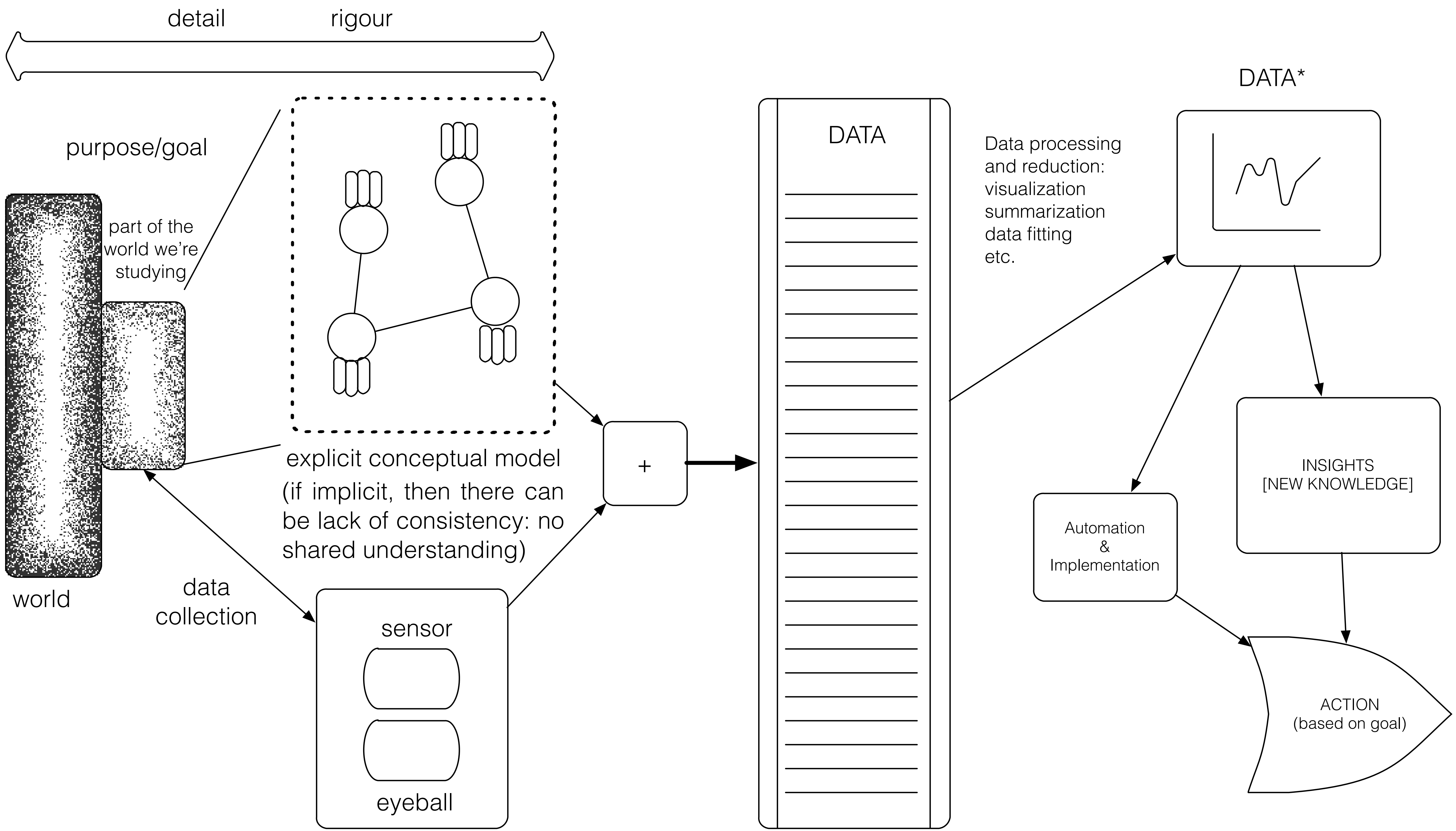
- field trips
- interviews with subject matter experts (SMEs)
- readings
- data exploration (even just trying to obtain the data can prove a pain)
- etc.

Information Gathering

The client is not a uniform entity – it's possible that its data specialists and SMEs will **resent** the involvement of external consultants.

This stage of the process is a chance to show them that the consultants are on their side:

- ask **meaningful** questions
- take an interest in their experiences
- acknowledge their ability to help


detail
rigour
purpose/goal
part of the world we're studying
world
explicit conceptual model (if implicit, then there can be lack of consistency: no shared understanding)
data collection
sensor
eyeball
+
DATA
Data processing and reduction: visualization summarization data fitting etc.
DATA*
Automation & Implementation
INSIGHTS [NEW KNOWLEDGE]
ACTION (based on goal)

Thinking in Systems Terms

In order to understand how various aspects of the World interact with one another, we need to **carve out chunks** corresponding to the aspects and define their **boundaries**.

Working with other intelligences requires **shared understanding** of what is being studied.

A **system** is made up of **objects** with **properties** that potentially change over time. Within the system we perceive **actions** and **evolving** properties leading us to think in terms of **processes**.

Thinking in Systems Terms

Objects themselves have various properties. Natural processes generate (or destroy) objects, and may change the properties of these objects over time.

We **observe**, **quantify**, and **record** particular values of these properties at particular points in time.

This generates data points, capturing the **underlying reality** to some degree of **accuracy** and **error** (biased or unbiased)… but it's always going to be an approximation.

Identifying Gaps in Knowledge

A **gap in knowledge** is identified when we realize that what we thought we knew about a system proves incomplete (or false).

This might happen repeatedly, at any moment in the process:

- data cleaning
- data consolidation
- data analysis

The solution is to be flexible. When faced with such a gap (it will happen!), **go back**, **ask questions**, and **modify the system representation**.

Conceptual Models

Exercise:

- assume that an acquaintance has just set foot in your living space for the first time.
- you are on the phone with them but not currently at home.
- explain to them how to go about preparing a cup of sugar.

Conceptual models are built using methodical investigation tools

- diagrams
- structured interviews
- structured descriptions
- etc.

Beware implicit conceptual models!

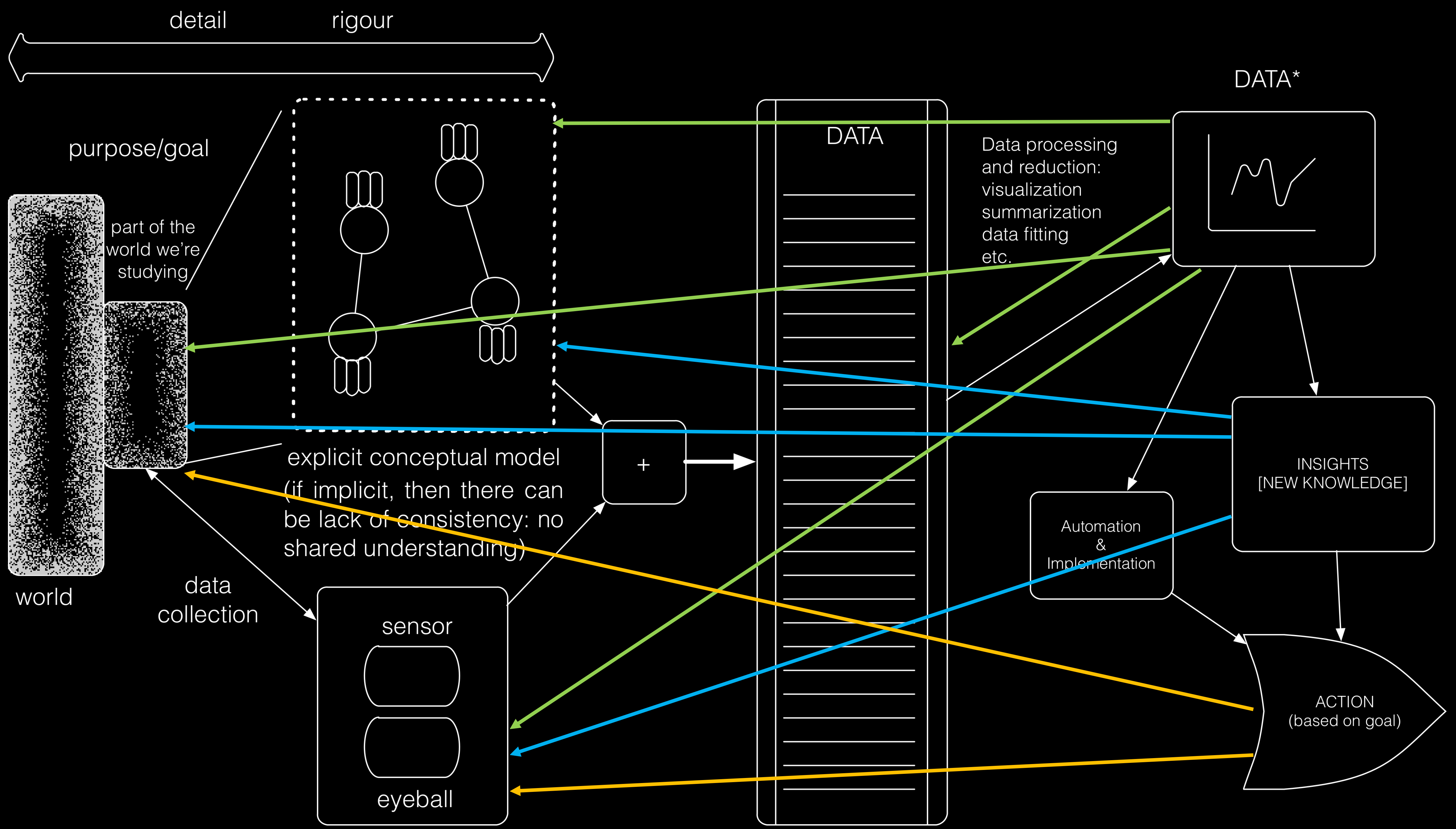
Relating the Data to the System

Is the data which has been collected and analyzed going to be of any use when it comes to understanding the system?

This question can only be answered if we understand:

- how the data is **collected**
- the **approximate nature** of both data and system
- what the data **represents** (observations and features)

Is the combination of system and data **sufficient** to understand the aspects of the world under consideration? If the data, the system, and the world are out of alignment, insights might prove useless.


detail
rigour
purpose/goal
part of the world we're studying
world
explicit conceptual model
(if implicit, then there can be lack of consistency: no shared understanding)
data collection
sensor
eyeball
+
DATA
Data processing and reduction:
visualization
summarization
data fitting
etc.
DATA*
INSIGHTS
[NEW KNOWLEDGE]
Automation
&
Implementation
ACTION
(based on goal)

Quantitative Analysis

In this course, we assume that **quantitative consultants** have expertise in one or more of the following **technical** areas:

- data collection
- data processing
- data visualization
- statistical analysis
- data science and machine learning
- optimization
- queueing models
- trend analysis and forecasting
- simulations
- etc.

This is where the bulk of the consulting work comes in.

The consultant's job is … **to get the job done**.

Make that happen, and you're golden.

Interpreting the Results

Actionable insights require results that can be interpreted and used by the client.

Reminder: the best academic or theoretical solution may not be an acceptable consulting solution.

As far as I can tell, this can only be taught through experience.

Take the time to read the accompanying case studies that focus on **results interpretation**.

Interpreting the Results

Case Studies

1. Data Collection: the Canadian Vehicle Use Study for TC
2. Data Processing: Blood Alcohol Level Imputation for the MTO
3. Data Visualization: Reliability of the Canadian Consular Network Data for GAC
4. Statistical Analysis: Assessing the Effect of a Probiotic Agent on IBS for the OICC
5. Data Science and Machine Learning: Predicting CIS Status for PHAC
8. Time Series Analysis: Analysis of Fluidity Indicators and Seasonality Adjustment for TC
9. Simulations: Failure Analysis Simulation Model for the NWMO
10. Analytics: Predicting Flight Routes for Telesat
11. Data Science and Machine Learning: Clustering Health Regions for StatCan

Deliverables

Deliverables are **concrete** products provided by the consultants to the client in their search for **actionable** solutions.

They constitute a form of **proof** that the work has been done.

They might include:

- code, software, apps
- literature review, case study write-up, recommendation, expert advice, popular account
- progress reports, minutes, notes, quality plan
- final report, presentation, poster, executive summary, dashboard, user manual, paper

Project deliverables depend on the client and on the project.

Deliverables

Code, software, apps should be **documented/tested** prior to demo/delivery (nothing looks worst than code that doesn’t work).

Use programming guidelines and make sure that code is devoid of offensive comments and variable/function names.

Progress reports let the client know what is being done and what remains to be done

- keep to the essentials: what’s new, what’s left to do, what SMEs are needed, timeline estimates, etc.
- frequency should be arranged with the client (not more often than weekly, usually)
- can also be used internally (together with minutes and notes, for project management)

Final Report

The **purpose** of the project leads to the type of report. Typically, a final report contains **at least** the following sections:

- executive summary
- background
- objective
- methodology
- results
- discussion / interpretation
- recommendations
- references & technical app.

There will be instances where consultants have to tell the story of the project (popular accounts, say), but in all other instances consultants should use **technical writing**.

Final Report

Say what needs to be said, in a manner that is understandable and useful to the client.

The executive summary should include the recommendations and highlights – it is directed at stakeholders who may not even be aware that the project has been undertaken.

Proof-read the report for spelling, grammar, and style.

Make the report **appealing** – forego fancy fonts and unusual font sizes. If you use mathematical symbols, consider using LaTeX.

Samples

CVs

- PBCV1.pdf, PBCV2.pdf, SHCV1.pdf, SHCV2.pdf

Websites

- cqads.carleton.ca, datascienceexpertsgroup.com

Blog Articles

- ANN_blog.pdf, TFPD.pdf

Case Studies

- Data_Science_Articles.pdf

Workplans

- workplan1.png, workplan2.png, Tasks_1.png, Tasks_2.png, Tasks_3.png

Contract

- PSAE.pdf

Samples

Summaries

- Summary_CATSA.pdf, Summary_TC.pdf

Proposals

- Pr_GAC1.pdf, Pr_GAC2.pdf, Pr_NWMO_Amendment.pdf, Pr_OPFFA2.pdf, Pr_Repable.pdf

Quality Plan

- PQPNWMO.pdf

Reports

- CVUS(Extract).pdf, CVUS_Q1_2012_Estimates.pdf, ES_TC_NWMO.pdf, Report_CCNM2.pdf

Progress Report

- PR_NWMO1.pdf, PR_NWMO2.pdf, PR_NWMO3.pdf

Notebook

- TDA 07 – Predicting Algae Blooms (L. Torgo)

Invoicing

Consultants cannot get paid without invoicing the client.

Keep invoices **simple**; in line with deliverables and milestones described in proposal (or amendments).

Invoicing types:

- upfront (training sessions?)
- at regular interval (advisory or long-term work)
- after milestones and deliverables (modular projects)
- upon completion (if you trust the client – government department)
- mixture

Goal: keep money flowing so you can pay expenses and salaries

Closing the File

Deliverables are in. Project is over. What next?

Post-mortem

- with the team, analyze the project process
- what were the high marks and the low points?
- how could thing have been done differently, in hindsight?
- if the opportunity for a second project with the same client presents itself: go/no go?

Consider doing the same with the client (could be quite painful).

Goal is not to assign blame, but to learn a variety of lessons as we gear up for the next project.