Plan for Today

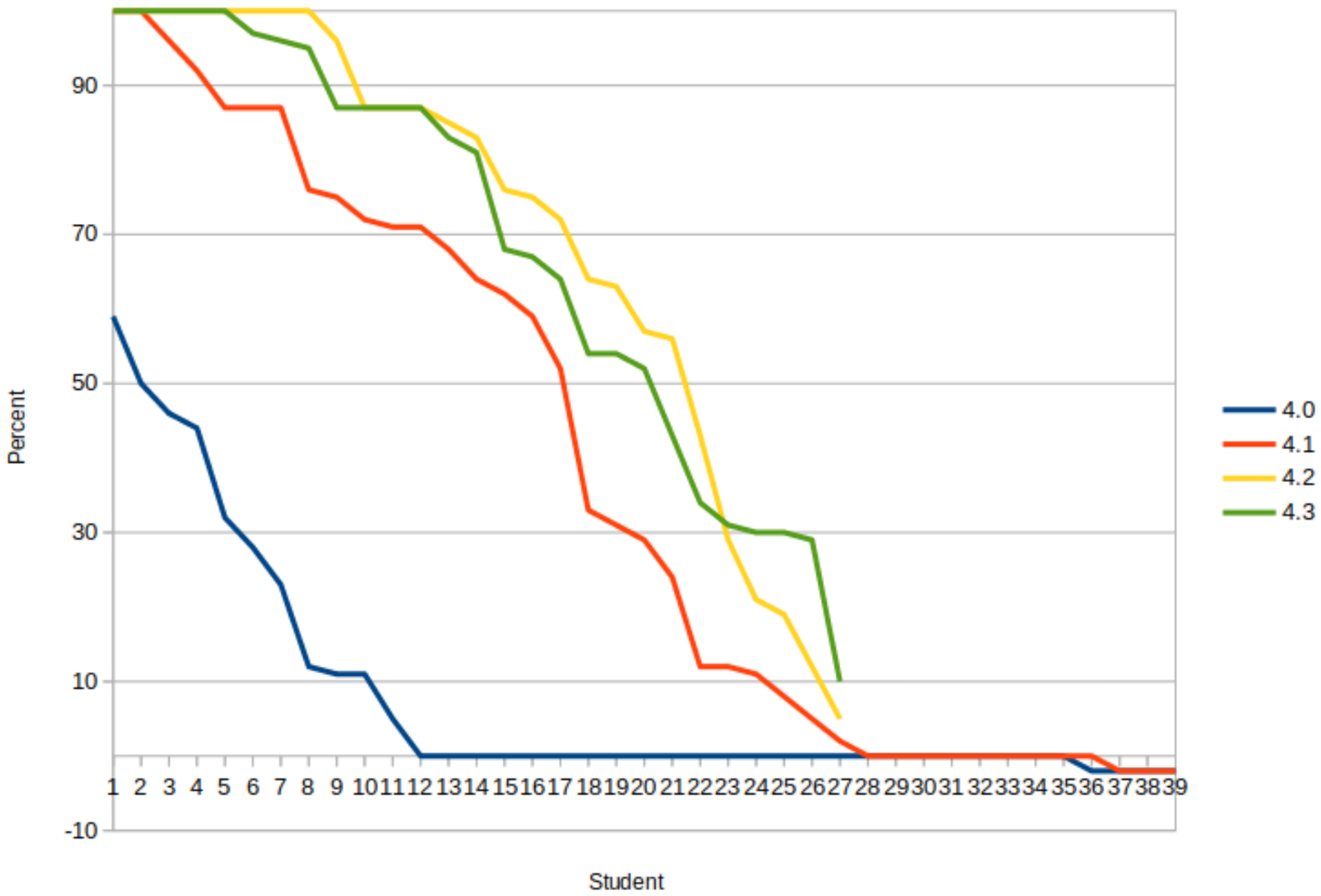
- Status reports
- Architecture

- Tasks 4.4-6
- Lab Monday

Lecture 37 – 11 November

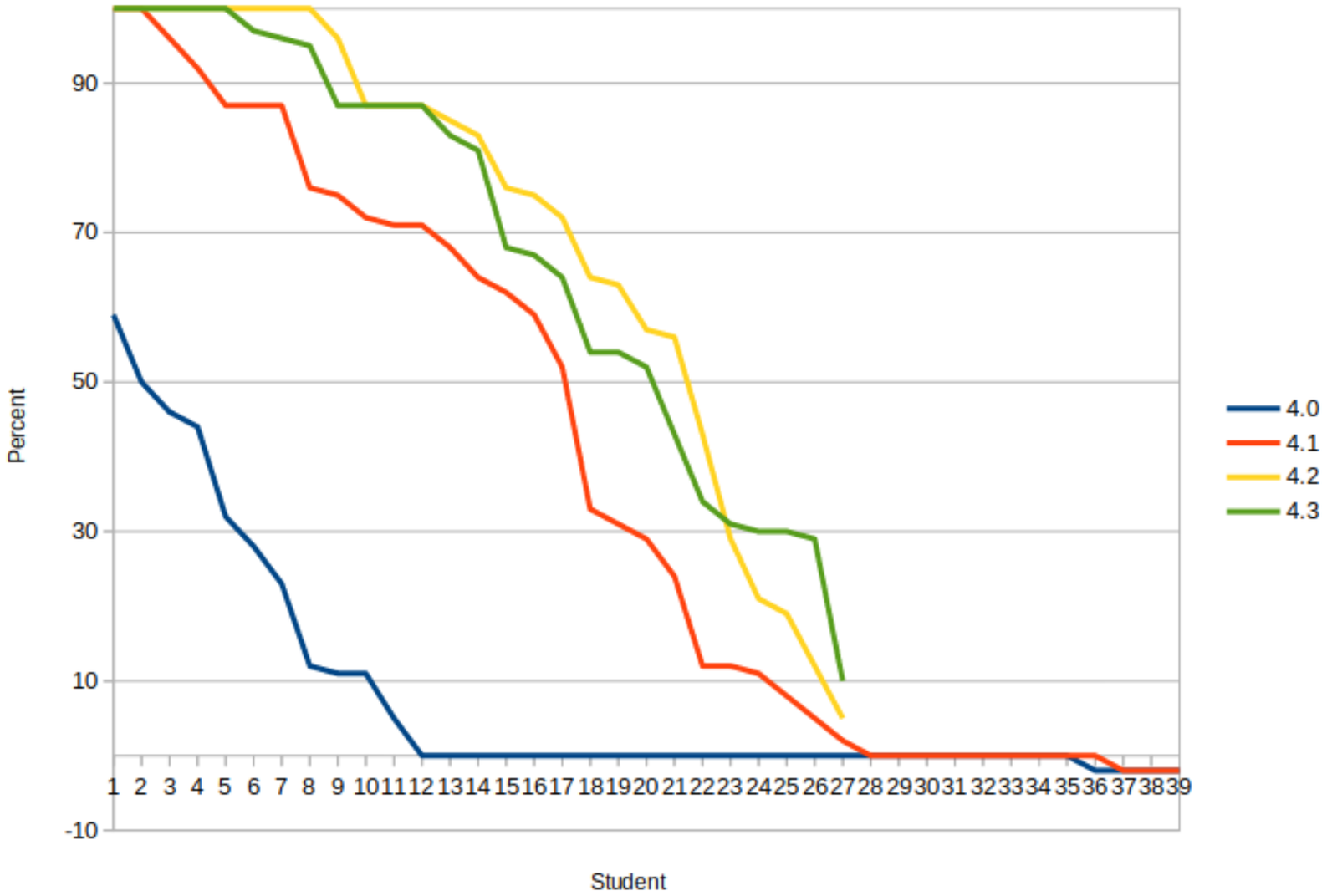
###

Task 4

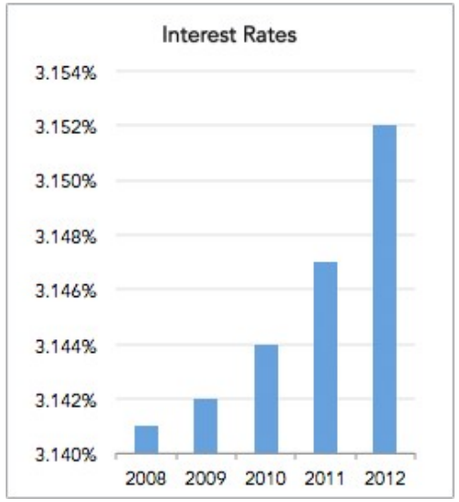


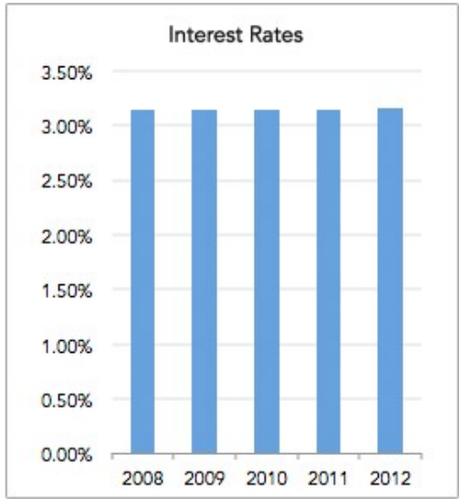
read ➔ understand ➔ plan ➔ execute ➔ verify ➔ reflect

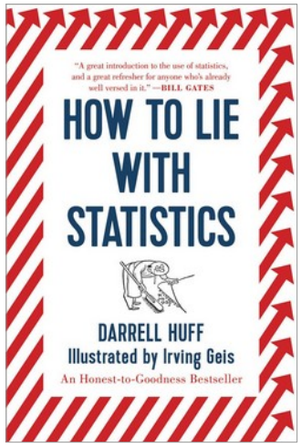
Task 4

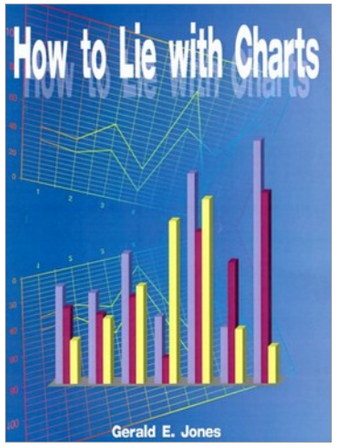


Same Data, Different Y-Axis

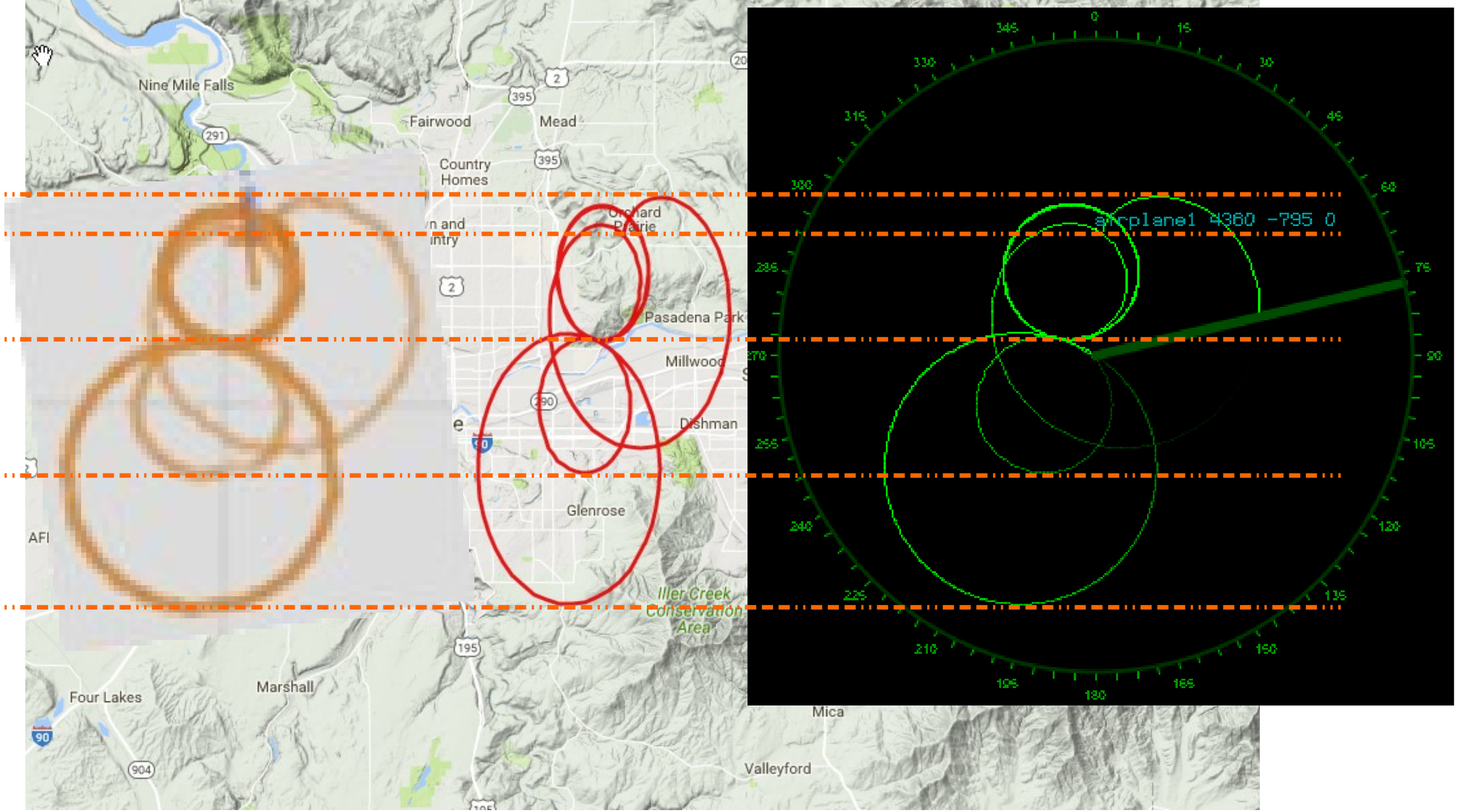








read ➔ understand ➔ plan ➔ execute ➔ verify ➔ reflect



view = model = world?

CS 350 Gradebook

Student	Task 1	Task 2	Task 3	Task 4.0 Pre	Task 4.0	Task 4.1 Pre	Task 4.1	Task 4.2	Task 4.3	Task P1	Task P2	SR1.I	SR1.T	SR2.I	SR2.T	SR3.I	SR3.T	SR4.I	SR4.T	SR5.I	SR5.T	SR6.I	SR6.T	Raw %	Adj %
[redacted]	100.0			2.0	59.0	2.0	100.0	100.0	100.0															46.0	100.0
	100.0			2.0	50.0	2.0	100.0	100.0	100.0															46.0	100.0
	100.0			2.0	46.0	2.0	96.0	100.0	100.0															46.0	100.0
	100.0			2.0	44.0	2.0	92.0	100.0	100.0															46.0	100.0
	100.0			2.0	32.0	2.0	87.0	100.0	100.0															46.0	100.0
	100.0			2.0	28.0	2.0	87.0	100.0	97.0															45.1	98.1
	100.0			2.0	23.0	2.0	87.0	100.0	96.0															44.9	97.6
	100.0			2.0	12.0	2.0	76.0	100.0	95.0															43.7	95.0
	100.0			2.0	11.0	2.0	75.0	96.0	87.0															43.1	93.8
	100.0			2.0	11.0	2.0	72.0	87.0	87.0															43.1	93.8
	100.0			2.0	5.0	2.0	71.0	87.0	87.0															42.5	92.3
	100.0			2.0	0.0	2.0	71.0	87.0	87.0															41.2	89.5
	100.0			2.0	0.0	2.0	68.0	85.0	83.0															40.3	87.5
	100.0			2.0	0.0	2.0	64.0	83.0	81.0															39.6	86.1
	100.0			2.0	0.0	2.0	62.0	76.0	68.0															39.0	84.7
	100.0			2.0	0.0	2.0	59.0	75.0	67.0															37.7	82.0
	100.0			2.0	0.0	2.0	52.0	72.0	64.0															37.1	80.6
	100.0			2.0	0.0	2.0	33.0	64.0	54.0															35.9	78.0
	100.0			2.0	0.0	2.0	31.0	63.0	54.0															35.9	78.0
	100.0			2.0	0.0	2.0	29.0	57.0	52.0															34.4	74.9
	100.0			2.0	0.0	2.0	24.0	56.0	43.0															32.5	70.6
	100.0			2.0	0.0	2.0	12.0	43.0	34.0															30.6	66.5
	100.0			2.0	0.0	2.0	12.0	29.0	31.0															29.6	64.3
	100.0			2.0	0.0	2.0	11.0	21.0	30.0															27.6	60.0
	100.0			2.0	0.0	2.0	8.0	19.0	30.0															26.2	57.0
	100.0			2.0	0.0	2.0	5.0	12.0	29.0															26.2	56.9
	100.0			2.0	0.0	2.0	2.0	5.0	10.0															25.4	55.3
	97.0			2.0	0.0	2.0	0.0	0.0	0.0															24.0	52.2
	97.0			2.0	0.0	2.0	0.0	0.0	0.0															24.0	52.2
	97.0			0.0	0.0	2.0	0.0	0.0																24.0	52.2
	97.0				0.0	2.0	0.0	0.0																24.0	52.2
	97.0				0.0	0.0	0.0	0.0																24.0	52.2
	93.0				0.0		0.0	0.0																24.0	52.2
	90.0				0.0		0.0																	23.3	50.7
	87.0				0.0		0.0																	23.0	50.0
	87.0				0.0		0.0																	22.3	48.6
	83.0						0.0																	21.1	46.0
	80.0																							19.3	41.9
	73.0																							17.1	37.1
																								0.0	0.0
Your Score (%)	100.0			100.0	59.0	100.0	87.0	100.0	0.0															24.0	52.2
Class Average (%)	96.9			96.7	8.9	96.9	40.2	58.1	64.3															32.5	70.7
Class Average, No 0 (%)	96.9			100.0	29.2	100.0	55.0	71.0	69.1															33.4	72.6
Your Delta (%)	+3.1			+3.3	+50.1	+3.1	+46.8	+41.9	-64.3															-8.5	-18.6
Worth	100.0			2.0	100.0	2.0	100.0	100.0	100.0															100.0	100.0
Average	96.9			1.9	8.9	1.9	40.2	58.1	64.3															32.5	70.7
Deviation	6.3			0.4	16.6	0.3	36.8	38.7	32.0															10.6	22.9
Maximum	100.0			2.0	59.0	2.0	100.0	100.0	100.0															46.0	100.0
Minimum	73.0			0.0	0.0	0.0	0.0	0.0	0.0															0.0	0.0
Minimum, No 0	73.0			2.0	5.0	2.0	2.0	[illegible]	10.0															17.1	37.1
Count	39.0			39.0	39.0	39.0	39.0	39.0	39.0															40.0	40.0
Overall Weight (%)	22.0			1.0	0.0	1.0	0.0	0.0	22.0															100.0	100.0

read ➔ understand ➔ plan ➔ execute ➔ verify ➔ reflect

Status Reports, Sprint 1

"In god we trust.
All others must
bring data."

– W. Edwards Deming

Status Reports

Sprint	Due	Individual	Team
1	31 May	✓	✓
2	3 Jun		
3	8 Jun		
4	13 Jun		

Stu: You need to sit down for what I am going to tell you…

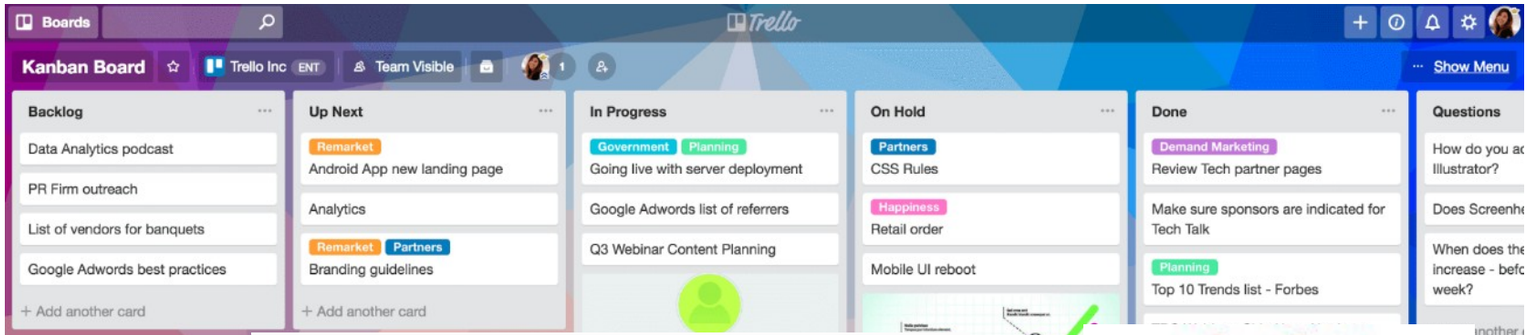
The new APE website was mostly faked, breaking the old APE website that was working.

Me: Can I say this to 350? Because I've already explained early on how this is standard capstone behavior!

Stu: Yes please. The team is having a really hard time to clean it up and just get it up.

…

80% of the time I know the past work is fake.



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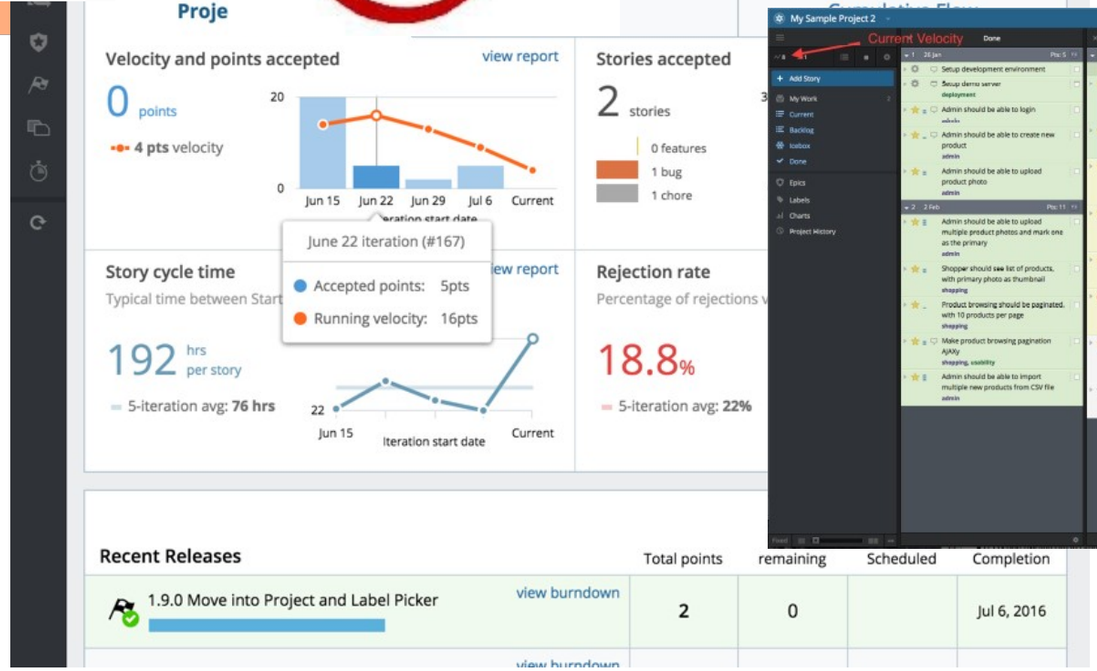
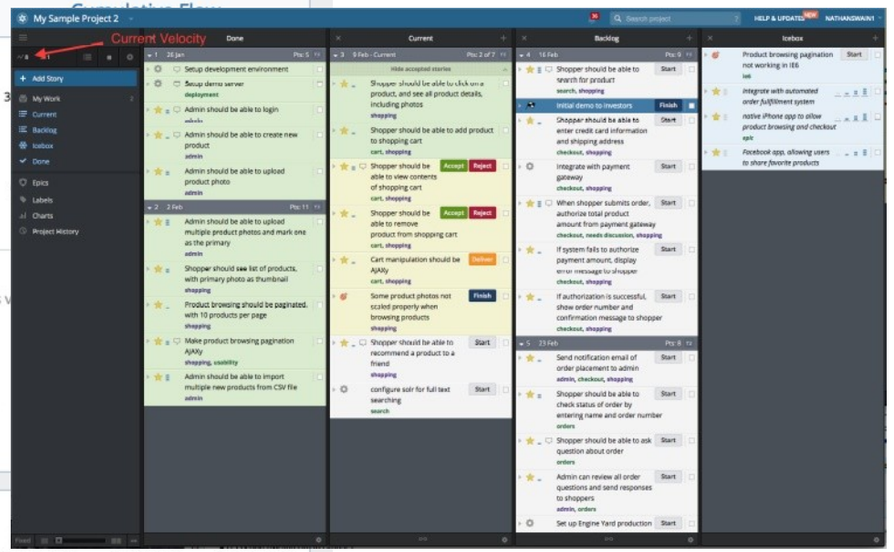




Team Report

CS 488T Senior Project (Tappan) Sprint 6 Team Status Report

Consider the following four pairs of questions hierarchically. They are not the same question. If you think they are, then you are likely not using an appropriate breadth and depth of software-engineering thought. This course is a practical application of the aspects of *product*, *process*, and *people*. We are trying to account for everything: not just to create a good product, but also to learn from the process to improve the people. Reflect on the experience of the entire team collectively over this sprint. You do not need to account for all activities, just two that were representative of easiest and hardest. Use activity codes (e.g., A1) for specific references, but most of the response should be in sentence form.

For reference, *understand* relates to the comprehension of what needs to be done; *approach* to how you think it should be solved; *solve* to implementing the actual solution; and *evaluate* to demonstrating to yourself and your team (if applicable) that the performance of your solution is consistent with everything else in the project. Remember The Cartoon from CS 350.

Everything on this form will be shared with all team members and the client.

Which aspects of the current work are the **easiest to understand**?

Which aspects of the current work are the **hardest to understand**?

Which aspects of the current work are the **easiest to approach**?

Which aspects of the current work are the **hardest to approach**?

Which aspects of the current work are the **easiest to solve**?

Which aspects of the current work are the **hardest to solve**?

Which aspects of the current work are the **easiest to evaluate**?

Which aspects of the current work are the **hardest to evaluate**?

How far along (as a percent) do you feel you are toward the final goal? Does this pace seem likely to succeed?

Did you meet or communicate with your client this week? If not, when was the last time?

Are there any issues, concerns, or comments about the project?

Submit

read ➔ understand ➔ plan ➔ *execute* ➔ verify ➔ reflect

Individual Report

CS 350 Software Engineering Sprint 1 Individual Status Report

Complete all relevant fields. Refer to the tutorial (coming) for instructions.

Your time and activity accounting will be shared with all team members and the client.

Your Time Accounting [Public]

What was your effort on the project during this sprint? For days with non-zero hours, you may add a brief description if the work is not a registered activity. Round to the nearest 15 minutes.

This course does not require time accounting. This section is disabled and appears only to provide an idea of how Senior Capstone does it.

Day	Hours	On What? (Optional)
Saturday		
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		

Your Activity Accounting [Public]

New Activities

Enter any new activities that you started during this sprint. They are assigned to you until at least the next sprint. There is no significance to the order, and activity codes may not be sequential. Choose a short, meaningful title that is a convenient, human-friendly reference. The description should be a concise summary of one thing that is to be done. Break larger tasks into multiple activities, but do not get carried away. In subsequent sprints, you will need to account for the status of each until they are closed. Estimate how many sprints you expect the activity to take. Finally, associate this activity with any requirements that it addresses. It is possible to have an activity without an explicit requirement (e.g., initially setting up the development server), but it is unlikely once the project is going. Everything you are doing needs to be attributed to a reason from a source, which is primarily the requirements.

Code	Title	Description	Sprints	Addressed Requirements **R2**
A41				
A42				
A43				
A44				
A45				
A46				
A47				
A48				
A49				
A50				

Temporary Requirements Cheatsheet:

ID	Title	Description
R2	Kickoff meeting with sponsor	Meet with sponsor to elicit initial project details.

Open Activities

There are no open activities from past sprints.

Teammate Activity Accounting [Private]

For each teammate, address the following questions. This information will not be part of the report to the team or client.

Stu Steiner

Stu did not submit a report in the last sprint or reported no activities.

Stu did not submit a report, so no hours are logged.

Overall is Stu performing to reasonable expectations?

○ Yes ○ No ○ Maybe (explain why)

Indicate any issues, concerns, or comments in regard to Stu: (optional unless you marked other than Yes above)

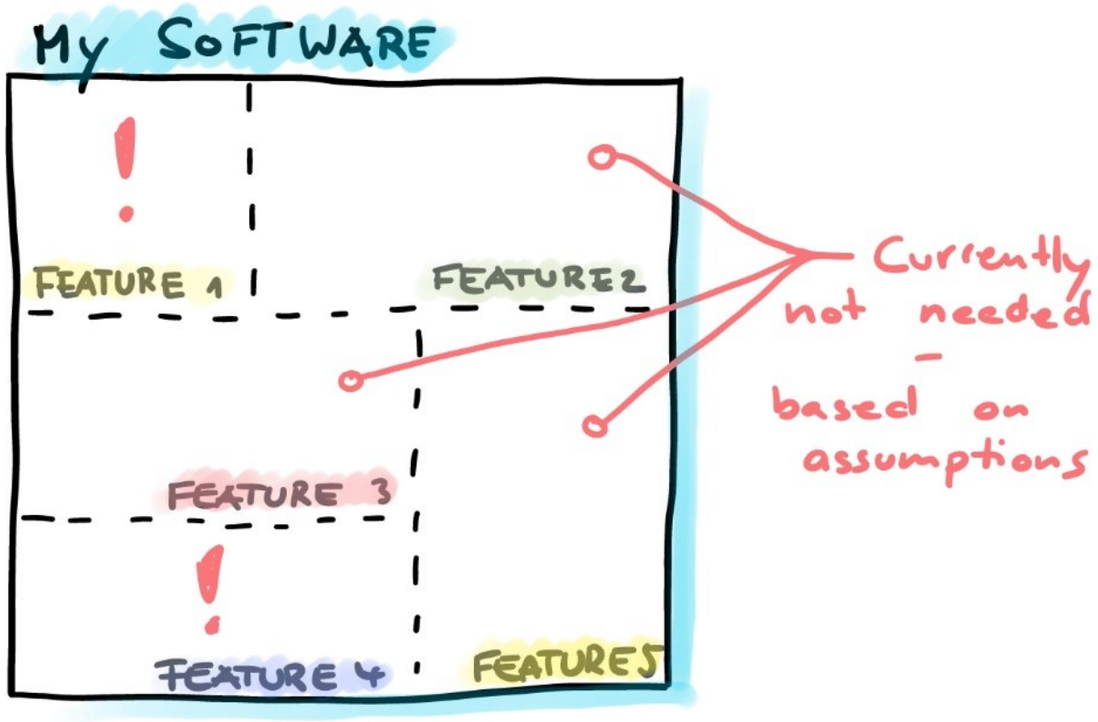
Project Accounting [Private]

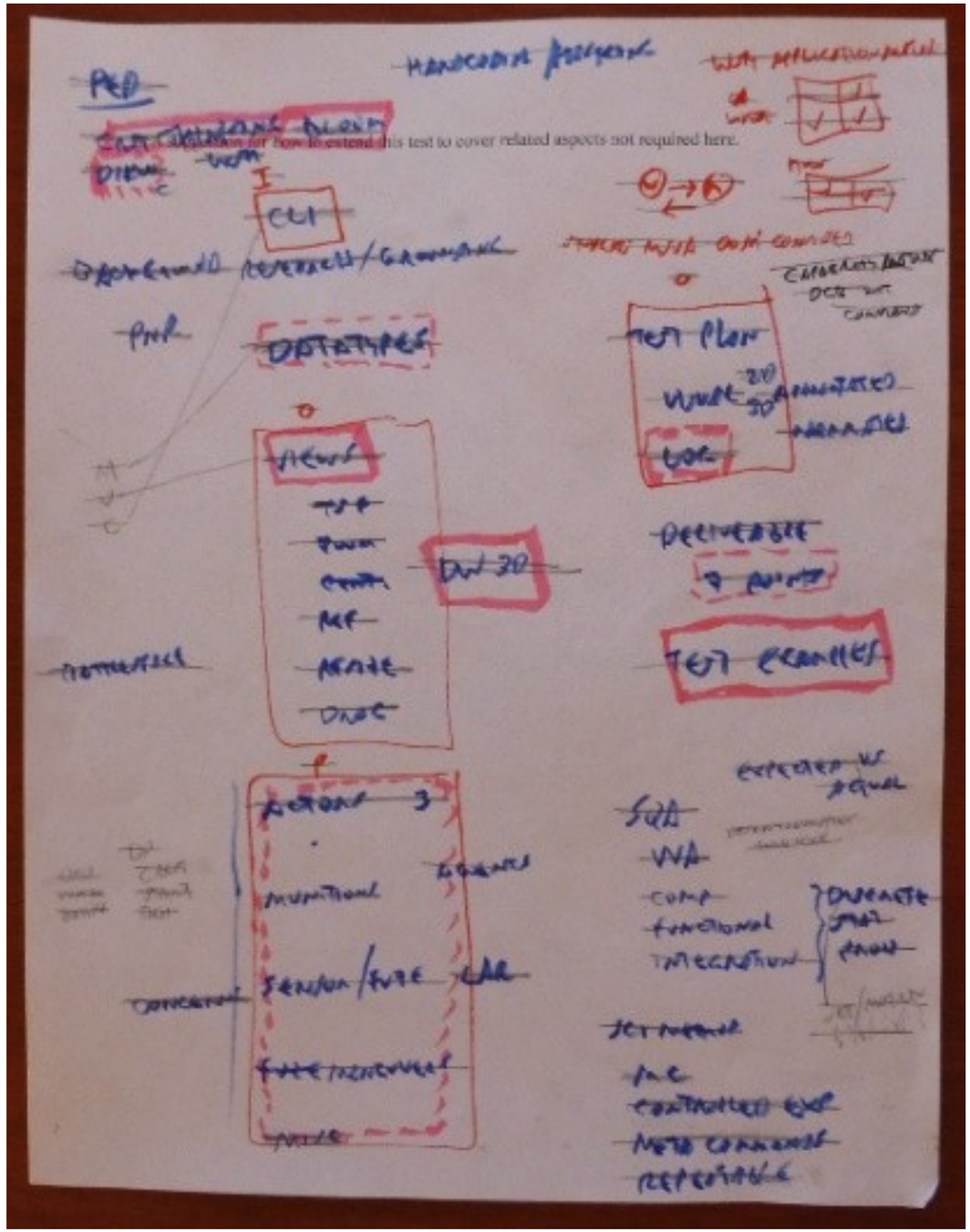
Indicate any issues, concerns, or comments in regard to the project overall: (optional)

Submit

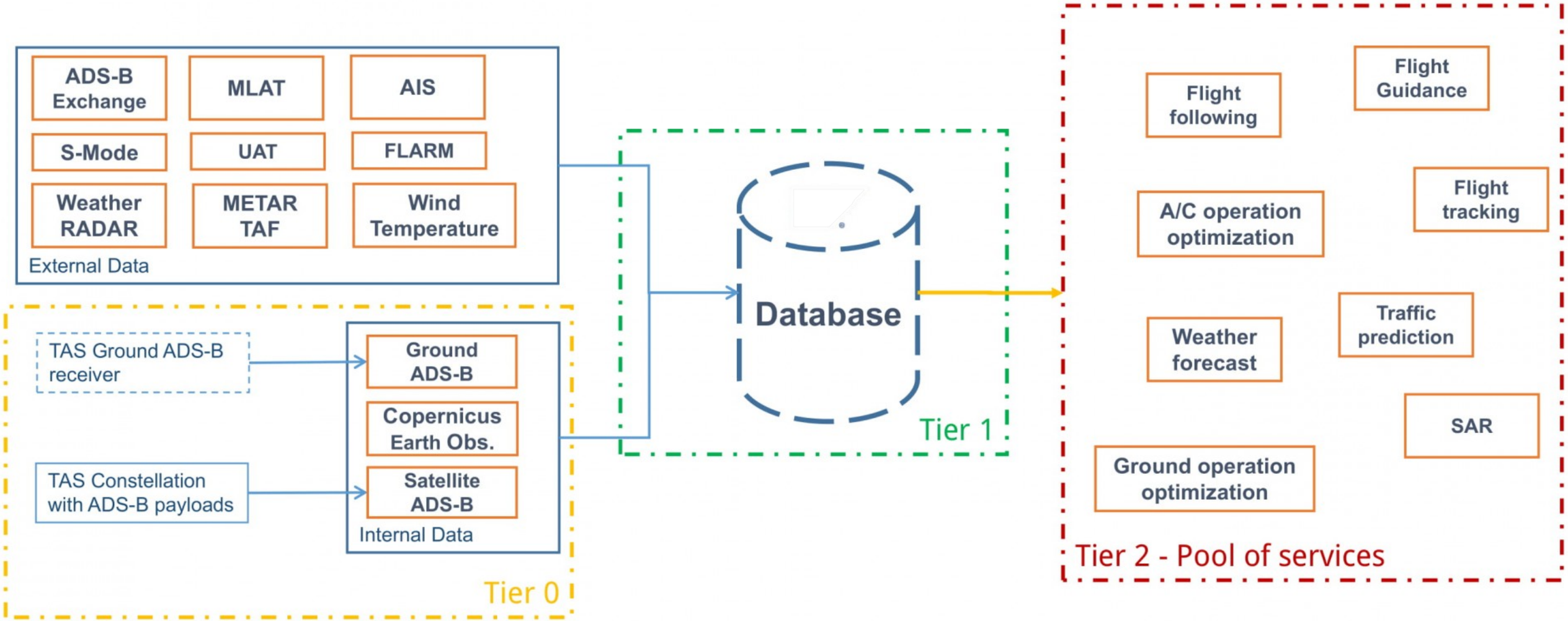
read ➔ understand ➔ plan ➔ execute ➔ verify ➔ reflect

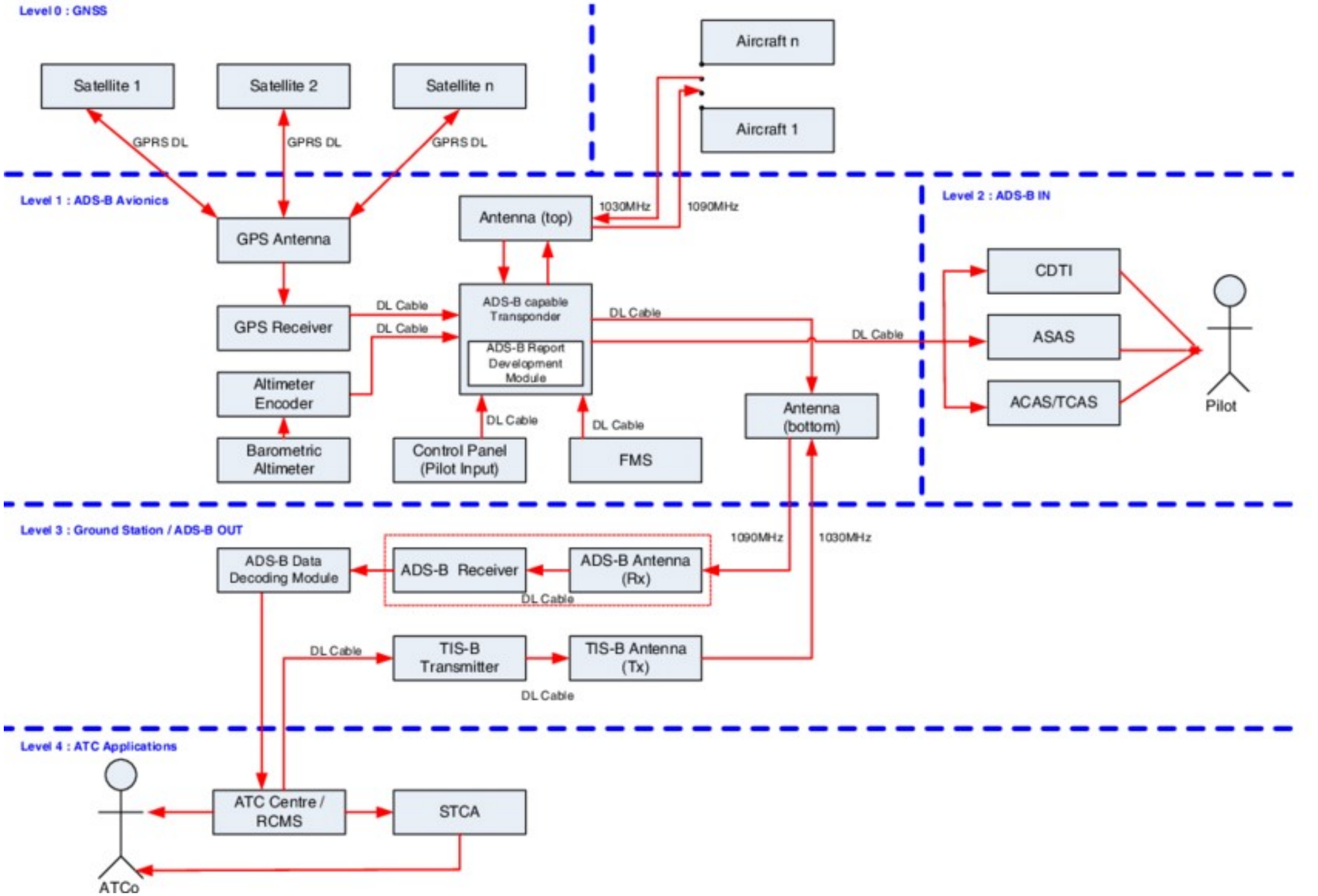
Separation of Concerns



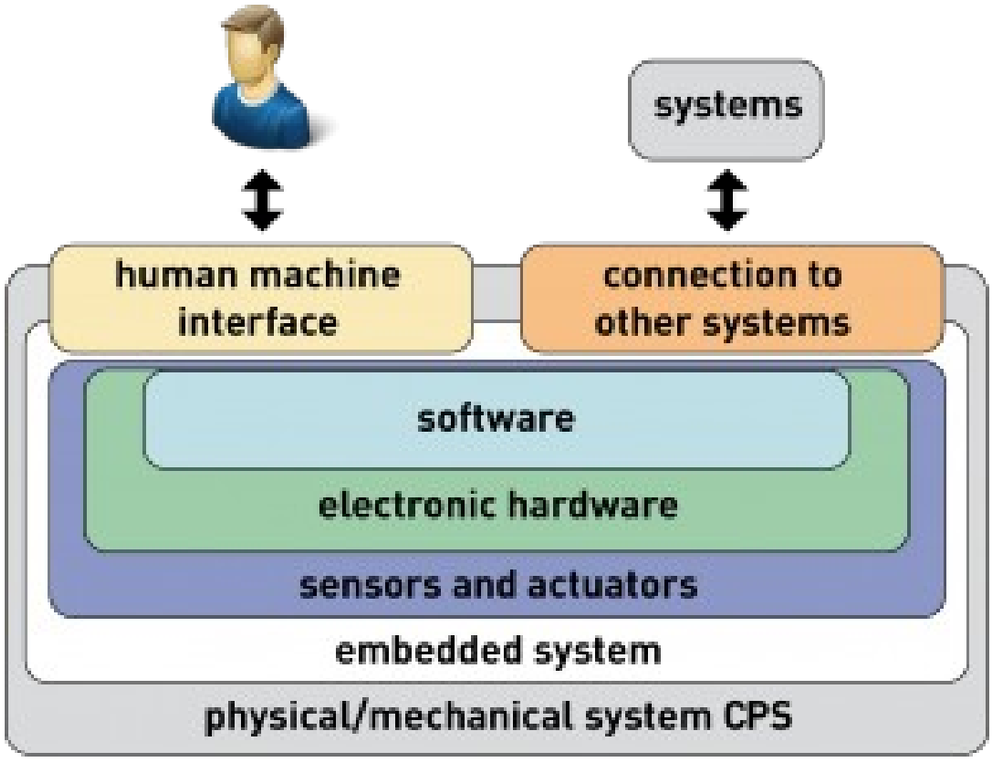


System Architecture

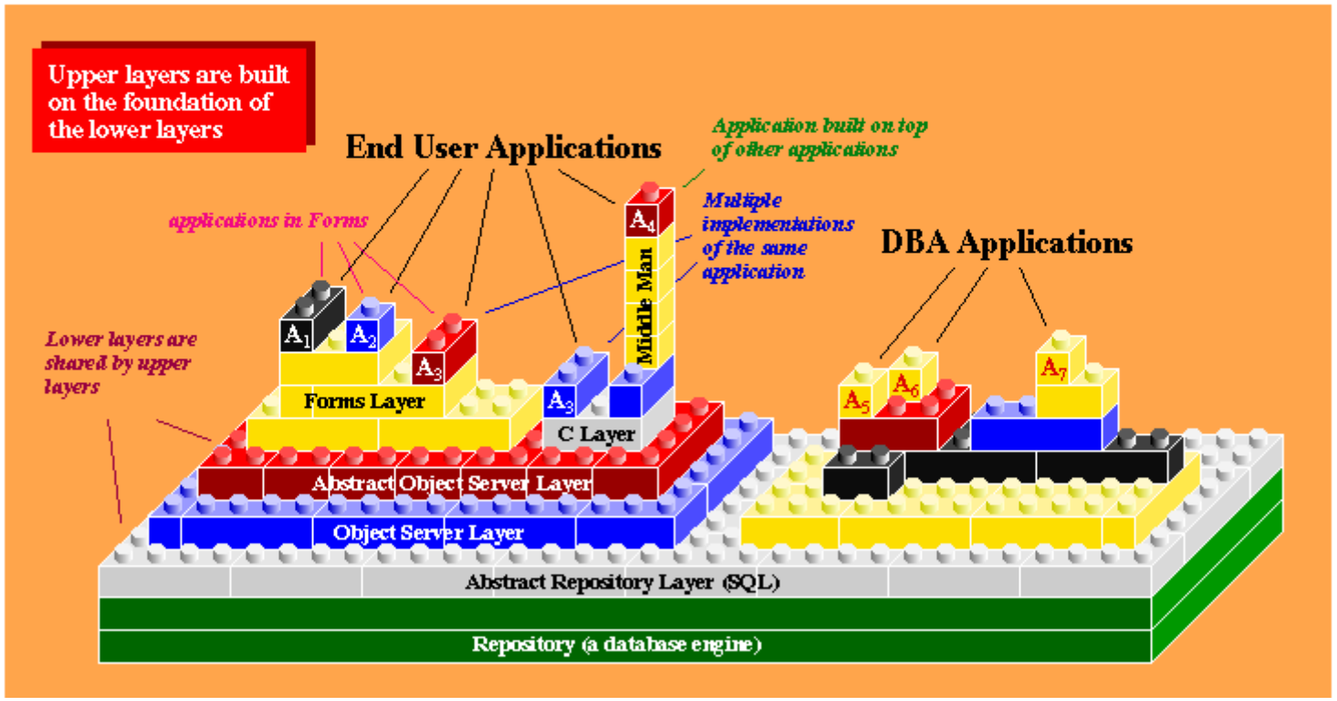


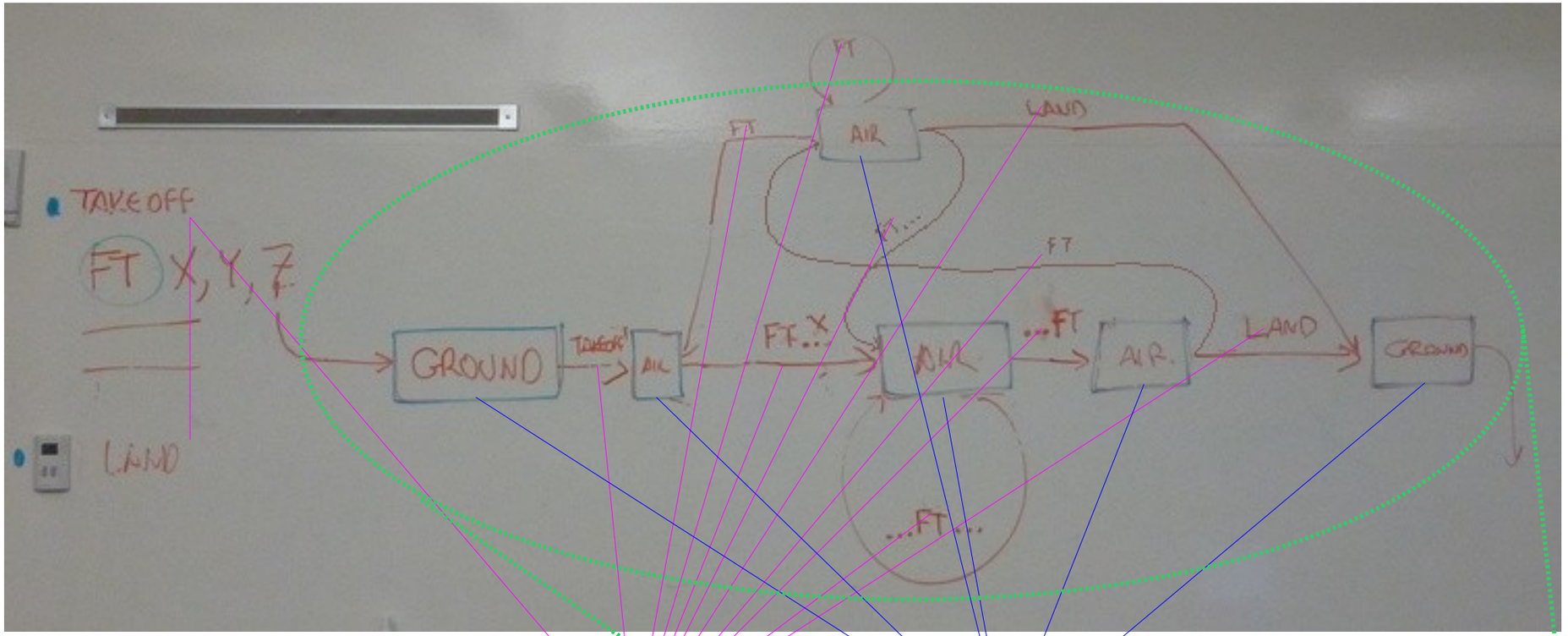

Level 0 : GNSS
Satellite 1
Satellite 2
Satellite n
GPRS DL
GPRS DL
GPRS DL
Aircraft n
Aircraft 1
Level 1 : ADS-B Avionics
GPS Antenna
GPS Receiver
Altimeter Encoder
Barometric Altimeter
Antenna (top)
1030MHz
1090MHz
ADS-B capable Transponder
ADS-B Report Development Module
DL Cable
DL Cable
DL Cable
DL Cable
DL Cable
DL Cable
Control Panel (Pilot Input)
FMS
Antenna (bottom)
Level 2 : ADS-B IN
CDTI
ASAS
ACAS/TCAS
Pilot
Level 3 : Ground Station / ADS-B OUT
ADS-B Data Decoding Module
ADS-B Receiver
ADS-B Antenna (Rx)
1090MHz
1030MHz
DL Cable
DL Cable
TIS-B Transmitter
TIS-B Antenna (Tx)
DL Cable
Level 4 : ATC Applications
ATC Centre / RCMS
STCA
ATCo

IT/OT Cyberphysical Systems



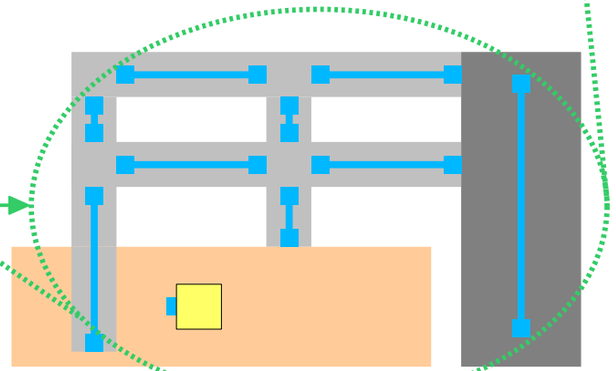
Architecture





controller

pilot



Project

Part I: world builder

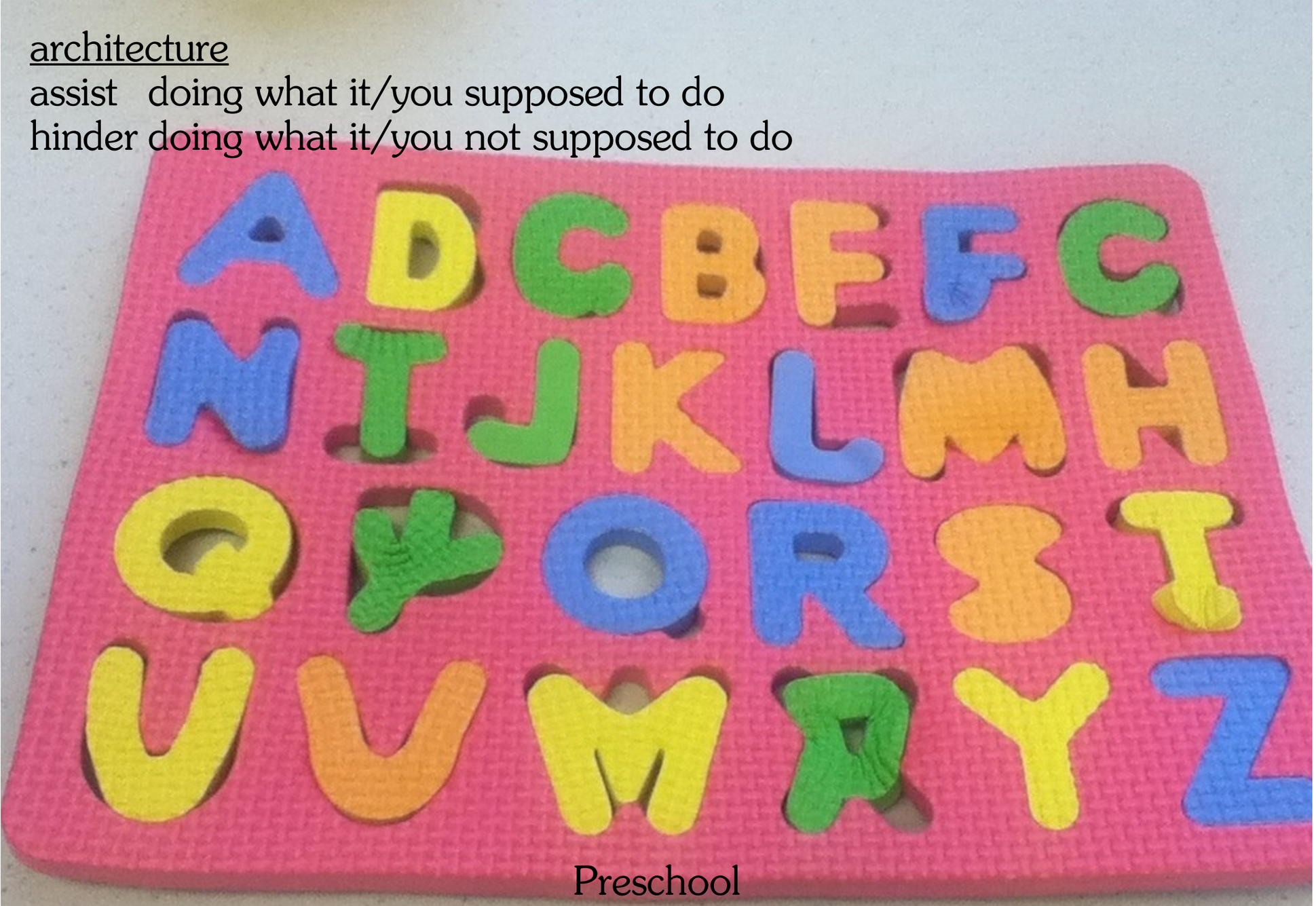
Part II: communication interface

Part III: agent executors

<u>architecture</u>

assist doing what it/you supposed to do

hinder doing what it/you not supposed to do



Preschool

Same story, different form

Munition	Acoustic	Depth	Distance	Radar	Sonar, passive	Sonar, active	Thermal	Time
	Sensor							
Bomb								
Depth Charge	✓	✓			✓	✓	✓	✓
Missile			✓	✓			✓	✓
Shell								✓
Torpedo	✓	✓	✓		✓	✓	✓	✓

Table 4.1: Compatibility Matrix

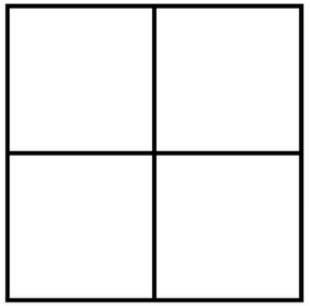
Source	Airplane	Ship	Submarine (A)	Submarine (B)
	Target			
Airplane	M	B,M,T	B,T	D,T
Ship		M,S,T	S,T	D,T
Submarine (A)		M,T	T	T
Submarine (B)		T	T	T

Table 4.2: Applicability Matrix

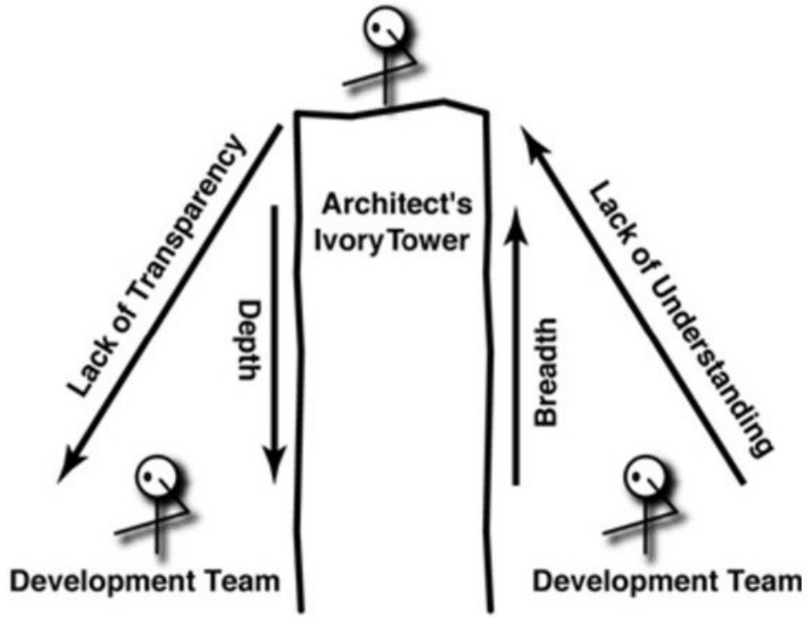
Industry

Architecture correct
Usage wrong

Architecture wrong
Usage correct

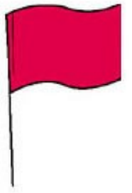


Bad Software Architect Conception



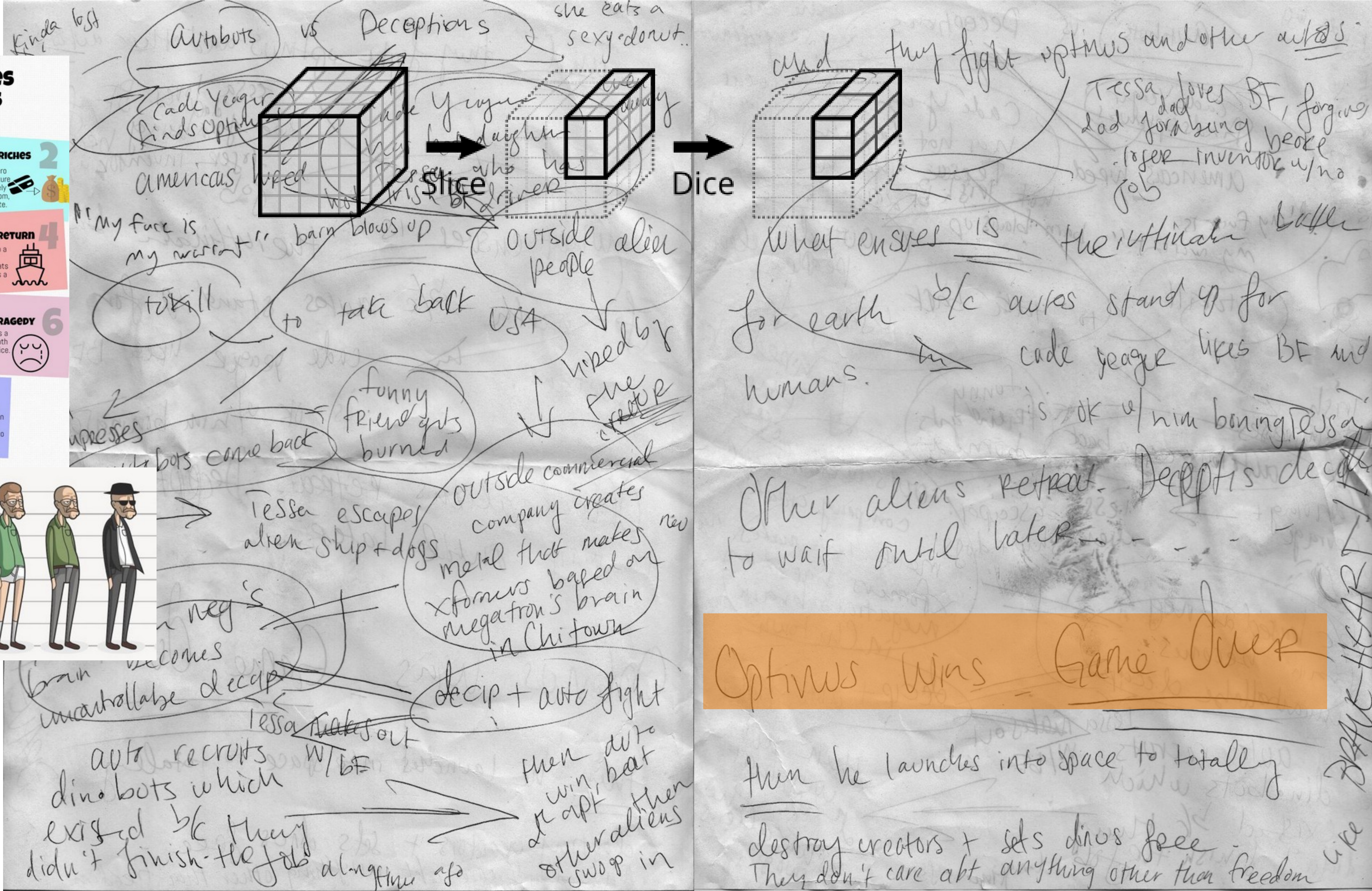
?

"still better than the Michael Bay movies"




7 BASIC TYPES OF STORIES
Aamna Khan, Vantage PR
1 OVERCOMING THE MONSTER
The hero learns of a great evil threatening the land, and sets out to destroy it.
2 RAGS TO RICHES
The initially poor hero blossoms into a mature figure who ultimately gets riches, a kingdom, and the perfect mate.
3 THE QUEST
The hero sets out on a mission, facing many obstacles and temptations along the way.
4 VOYAGE AND RETURN
The hero ventures to a strange land, overcoming the threats it poses, and returns a changed person.
5 COMEDY
A light and humorous story with a happy and cheerful ending.
6 TRAGEDY
The protagonist is a villain, whose death is a cause for rejoice.
7 REBIRTH
A story of reinvention and renewal; these often start off with tragic tones, then blossom into happy endings.


12 Types of Characters Featured in Almost All Stories
5ft
3ft


kinda lost
Autobots vs Decepticons
she eats a sexy donut
Cade Yeager finds Optimus
americas wiped
"my face is my warrant"
barn blows up
outside alien people
to kill
to take back USA
wiped by the creator
funny friend gets burned
autobots come back
Tessa escapes alien ship + dogs
outside commercial company creates new metal that makes xformers based on megatron's brain in Chi town
brain becomes uncontrollable decep
decip + auto fight
auto recruits dino bots which existed b/c they didn't finish the job a long time ago
then auto win but other aliens swoop in
and they fight optimus and other autos
Tessa loves BF, forgiving dad for being broke inventor w/no job
what ensues is the ultimate battle for earth b/c autos stand up for humans.
cade yeager likes BF and is ok w/ him boning Tessa
Other aliens retreat. Decepticons decide to wait until later
Optimus Wins Game Over
then he launches into space to totally destroy creators + sets dinos free
They don't care abt anything other than freedom
Slice
Dice

- **F (Fauna):** birds the size of a goose or larger, which do not generally fly in IMC or above 1000 ft AGL (above ground level). However, migrating birds can be encountered higher than this, typically in the range 5000 ft to 7000 ft AGL, often at specific times of year and in specific locations. Generally, the greater the height above the ground the less likely it is that birds will be encountered.
- **K (Kites and tethered balloons):** both the object itself and the cable connecting them to the ground. In general, operations above 400 ft should be notified by NOTAM.
- **R (Radio-controlled model aircraft operated by hobbyists):** generally operated in VMC below 400 ft AGL and within line of sight of the operator (typically 500 m). Operation above 400 ft should also be notified by NOTAM.
- **B (Hot air balloons):** which do not operate in IMC.
- **D (Dirigible airships).**
- **G (Gliders):** which do not operate in IMC.
- **P (Parachutists):** which are not usually present in IMC. Their activity is usually notified by NOTAM or known by the ATS.
- **S (Powered air sports):** such as very light aircraft, ultra-lights, motor gliders, motor paragliders, etc. Do not operate in IMC.
- **A (Unpowered air sports):** such as hang gliders, paragliders, etc. Do not operate in IMC.
- **H (Helicopters):** considering both civil and military.
- **L (Light aircraft):** such as non-pressurized general aviation.
- **Q (Pressurized general aviation with a maximum take-off mass (MTOM) less than 5700 kg).**
- **M (Military fighters and high-performance jets).**
- **N (Pressurized passenger aircraft not required to carry ACAS).**
- **T (Pressurized passenger aircraft required to carry ACAS).**
- **C (Cargo aircraft or military air transport):** generally with MTOM over 5700 kg and thus, expected to be ACAS equipped.
- **U (Unmanned aircraft):** a wide-ranging group covering a variety of sizes, airframe designs and capabilities.

Table 4.3 Categorization of flying threatening objects as a function of their cooperativeness and avoidance capabilities

Category	Cooperative	Can initiate avoiding action?	Category of objects
1	No	No	F, K, B, P, A, D
2	No	Yes in VMC	R, G, S, H, L, U
3	Yes	No	D
4	Yes	Yes in VMC and with ATC intervention in IMC	H, L, Q, N, T, C, M, U
5	Yes	Yes in VMC and with ATC intervention in IMC and in any situation if the intruder is equipped with a transponder	T, C, M, U

Table 4.4 Category of objects that may be found as a function of the flying altitude, meteorological conditions and traffic environment (from [24])

		Unknown traffic environment		Known traffic environment			
		Below FL100				Above FL100	
Object Category		VMC	IMC	VMC	IMC	VMC	IMC
Non-cooperative objects	1	√	√*	√	√*	×	×
	2	√	×	×	×	×	×
Cooperative objects	3	√	√	√	√	×	×
	4	√	√	√	√	√	√
	5	√	√	√	√	√	√

√ Category of objects that the UA might encounter.
× Category of objects that are unlikely to be encountered by the UA.
√* Tethered objects below 500 ft AGL are the only category of objects for this category.

Target

Source	Airplane	Ship	Submarine (A)	Submarine (B)
Airplane	M	B,M,T	B,T	D,T
Ship		M,S,T	S,T	D,T
Submarine (A)		M,T	T	T
Submarine (B)		T	T	T

Table 4.2: Applicability Matrix

Sensor

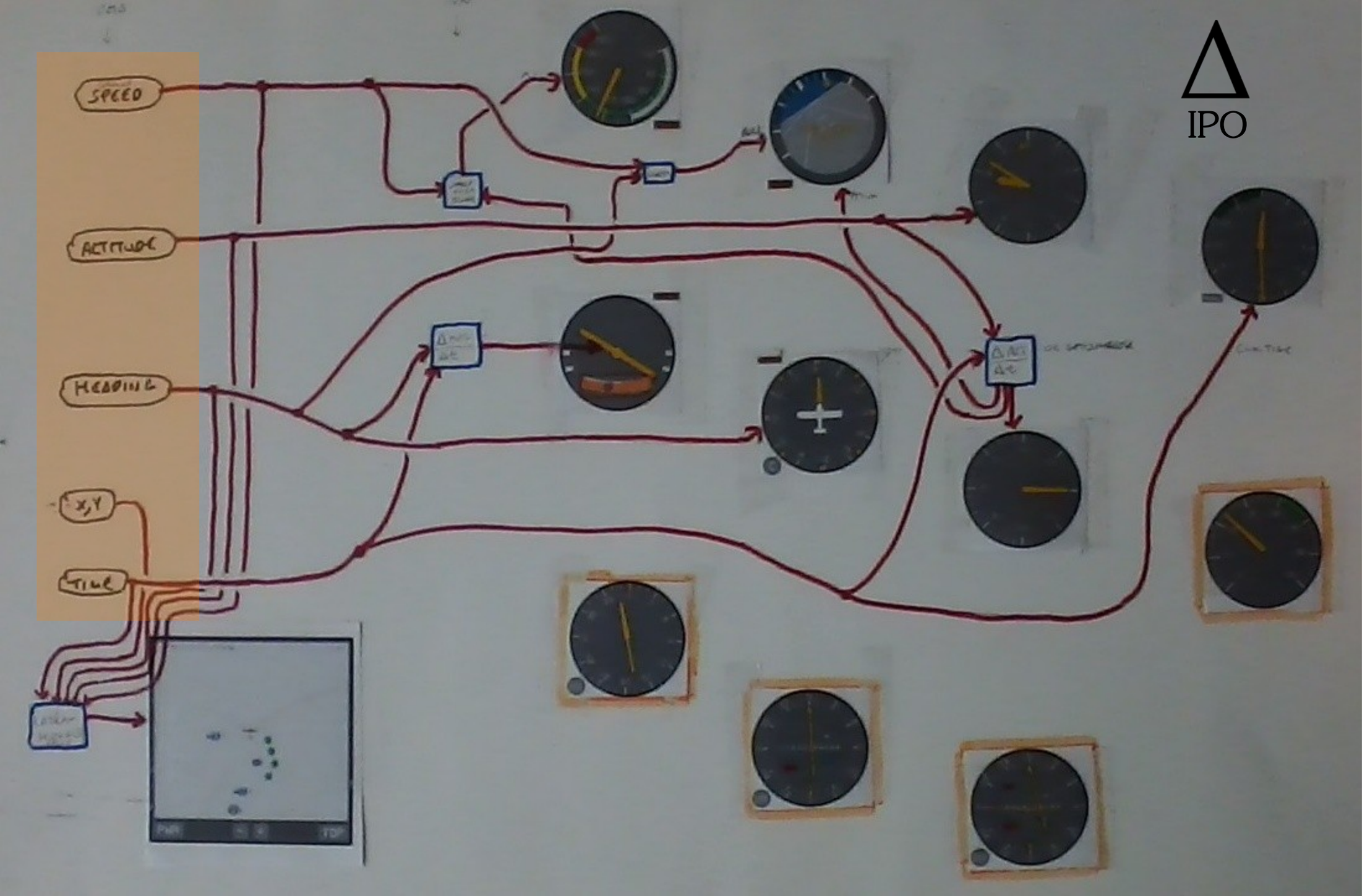
Munition	Acoustic	Depth	Distance	Radar	Sonar, passive	Sonar, active	Thermal	Time
Bomb								
Depth Charge	✓	✓			✓	✓	✓	✓
Missile			✓	✓			✓	✓
Shell								✓
Torpedo	✓	✓	✓		✓	✓	✓	✓

Table 4.1: Compatibility Matrix

Table 11.1 Testing required for military aircraft fuel systems.

First Article Inspection Program								
Inspection		Requirement	Test	Test article				
				1		2		3
0	Examination	3.2, 3.1.4	4.5.2	x		x		x
1	Break-in Run	3.2	4.5.3	x		x		x
2	Calibration	3.7.1	4.5.5	x		x		x
3	Speed	3.7.7	4.5.7	x		x		x
4	Leakage	3.6.2	4.5.4	x		x		x
5	Electrical Insulation	3.6.5.6	4.5.16.2	x		x		x
6	Fuel Resistance	3.4	4.5.11			x		
7	Corrosion Resistance	3.4	4.5.14	x				
8	Endurance	3.7.5	4.5.7	x				
9	Contaminated Fuel	3.5	4.5.13	x				
10	Altitude	3.7.2	4.5.6			x		
11	Gravity	3.7.4	4.5.9			x	or	x
12	Acceleration	3.7.3	4.5.8			x	or	x
13	Vibration	3.6.3.3	4.5.18.4			x	or	x
14	Water	3.7.6	4.5.17	x	or	x		
15	Icing	3.7.6	4.5.17.3	x	or	x		
16	Dust	3.7.8	4.5.18.3	x	or	x		
17	Pressure Surge	3.7.9	4.5.10	x	or	x		
18	Mechanical Shock	3.6.3.2	4.5.15.1					x
19	Mechanical Load	3.6.3.1	4.5.15.2	x		x		
20	Overspeed	3.6.11	4.5.15.3					x
21	Electrical Actuators	3.6.5.3, 3.6.5.4	4.5.16.1					x
22	Explosion Proof	3.6.5.5	4.5.16.3					x
23	Electrical Compatibility	3.6.5.7	4.5.16.4	x	or	x		
24	Thermal Protectors	3.6.6	4.5.16.5					x
25	Humidity	3.4, 3.7.6	4.5.18.1	x				
26	Fungus Resistance	3.4.1	4.5.18.2	x				
27	Acoustical Noise	3.6.3.3	4.5.18.5			x	or	x
28	Thermal Shock	3.7.10	4.5.18.6			x	or	x
29	Bonding and Lightning	3.6.4	4.5.19			x	or	x
30	Disassembly	3.1	4.5.20	x		x		x

Part III: agent executors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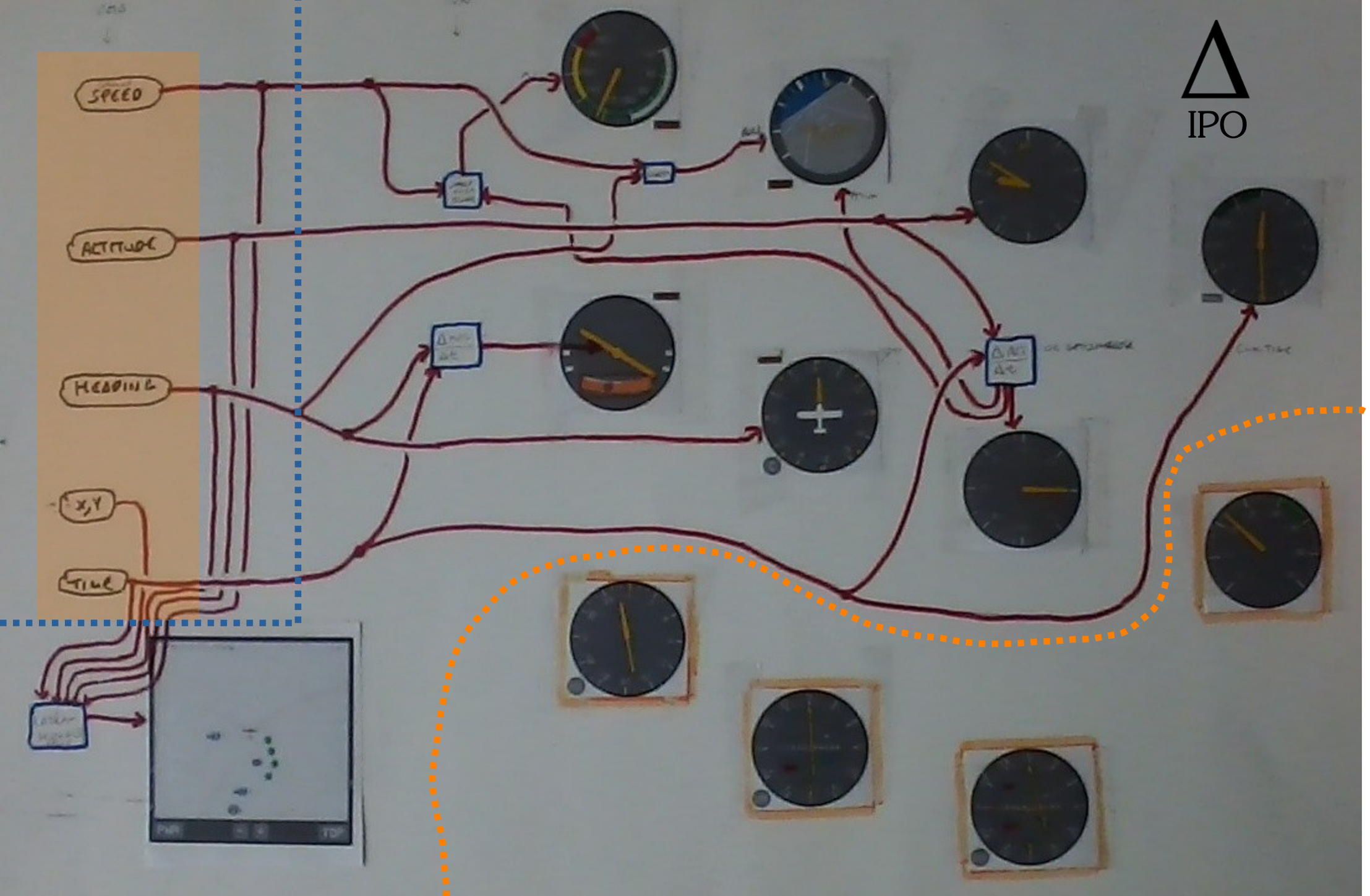
ATTITUDE
HEADING
X,Y
TIME
IPO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ATTITUDE
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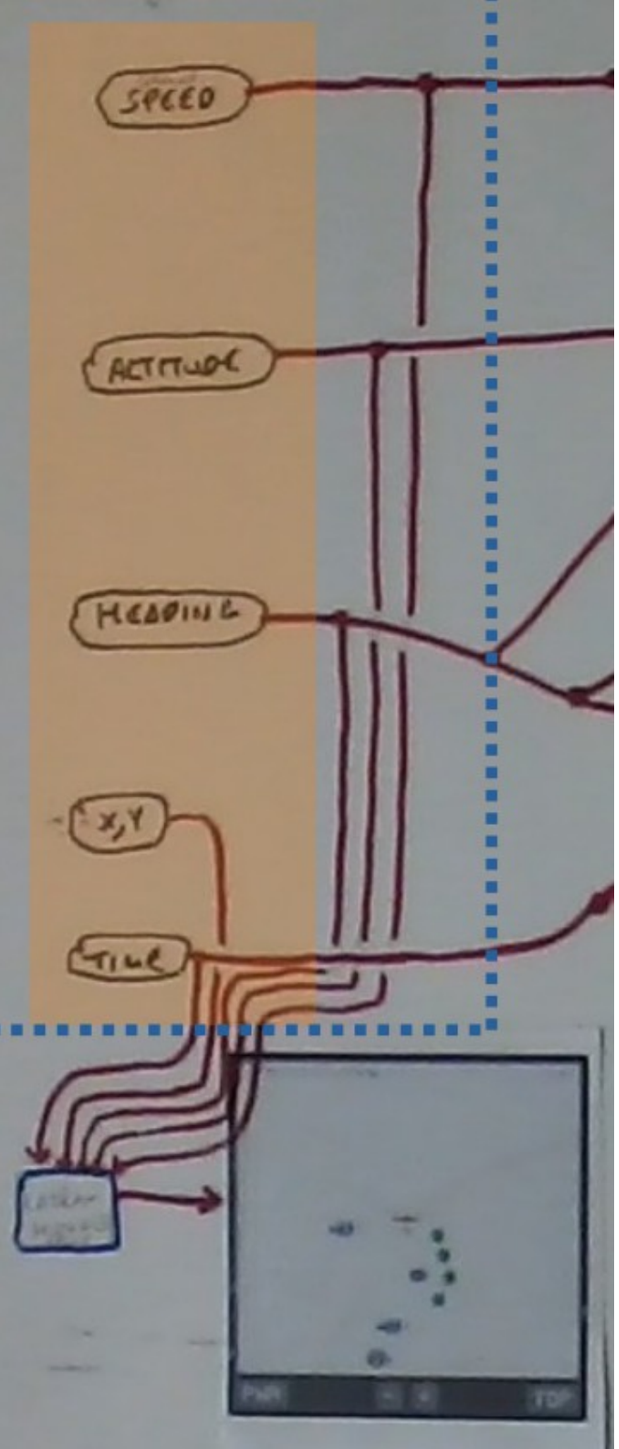
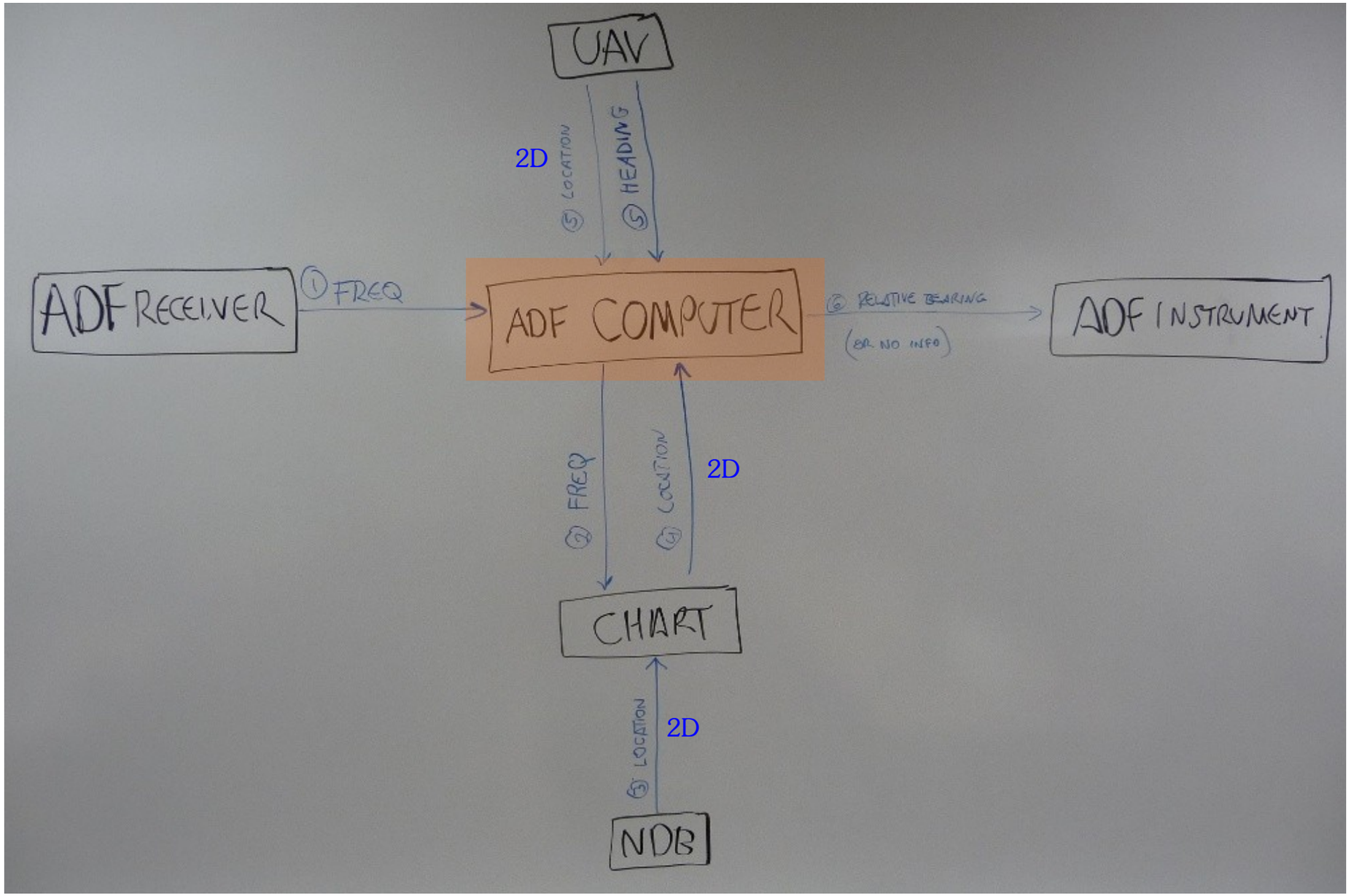
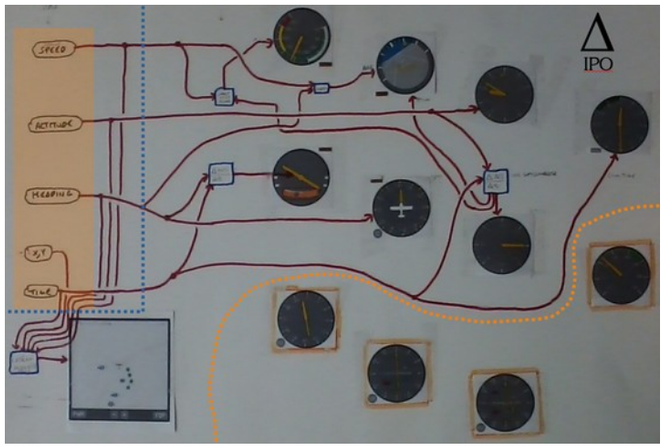

SPEED
ATTITUDE
HEADING
X,Y
TIME


N7265K
20.8 M.P.
2360 RPM
Artificial Horizon
Un-Mute
008° true
001° R
KCOE

ADF Computer





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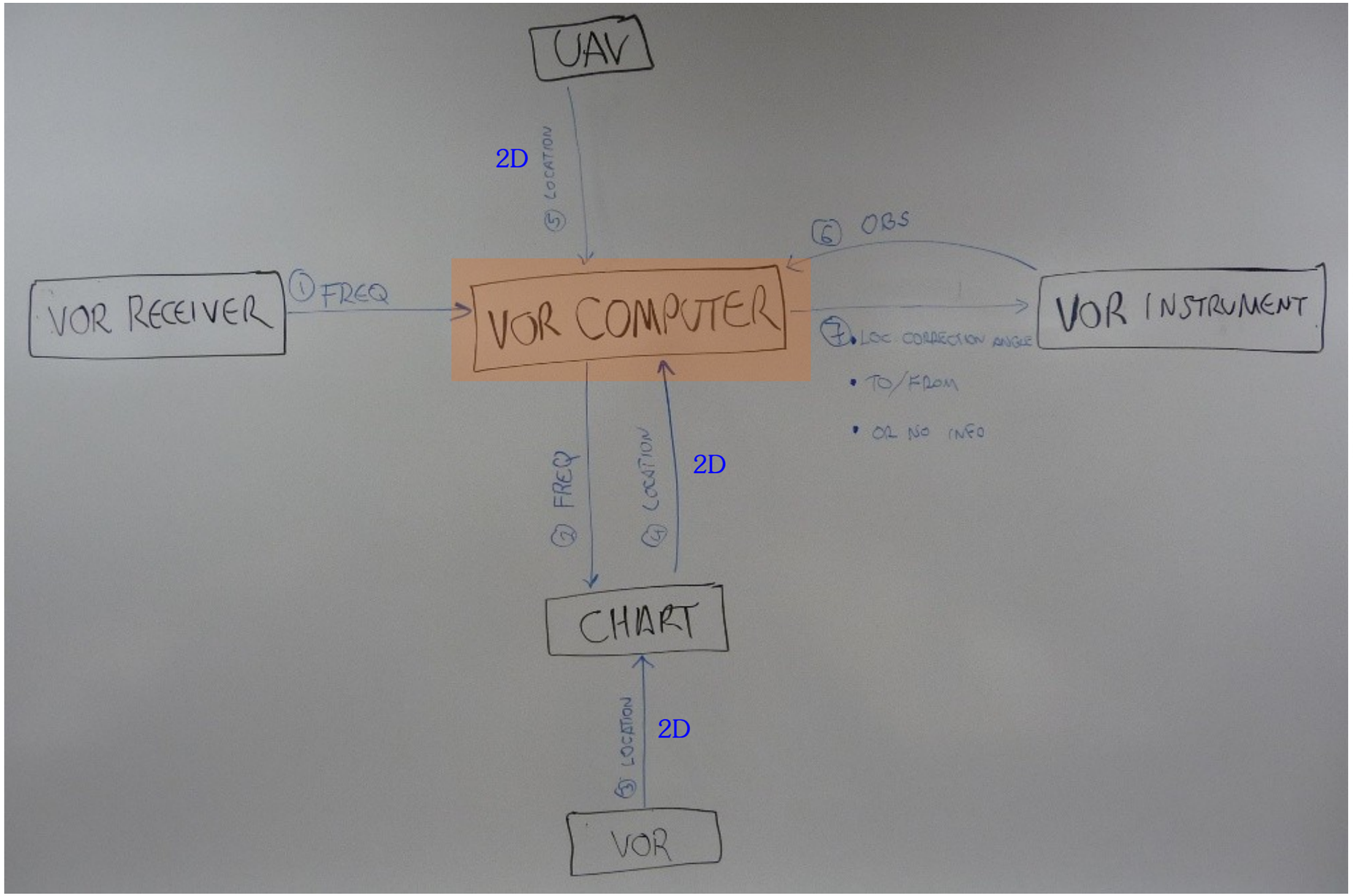
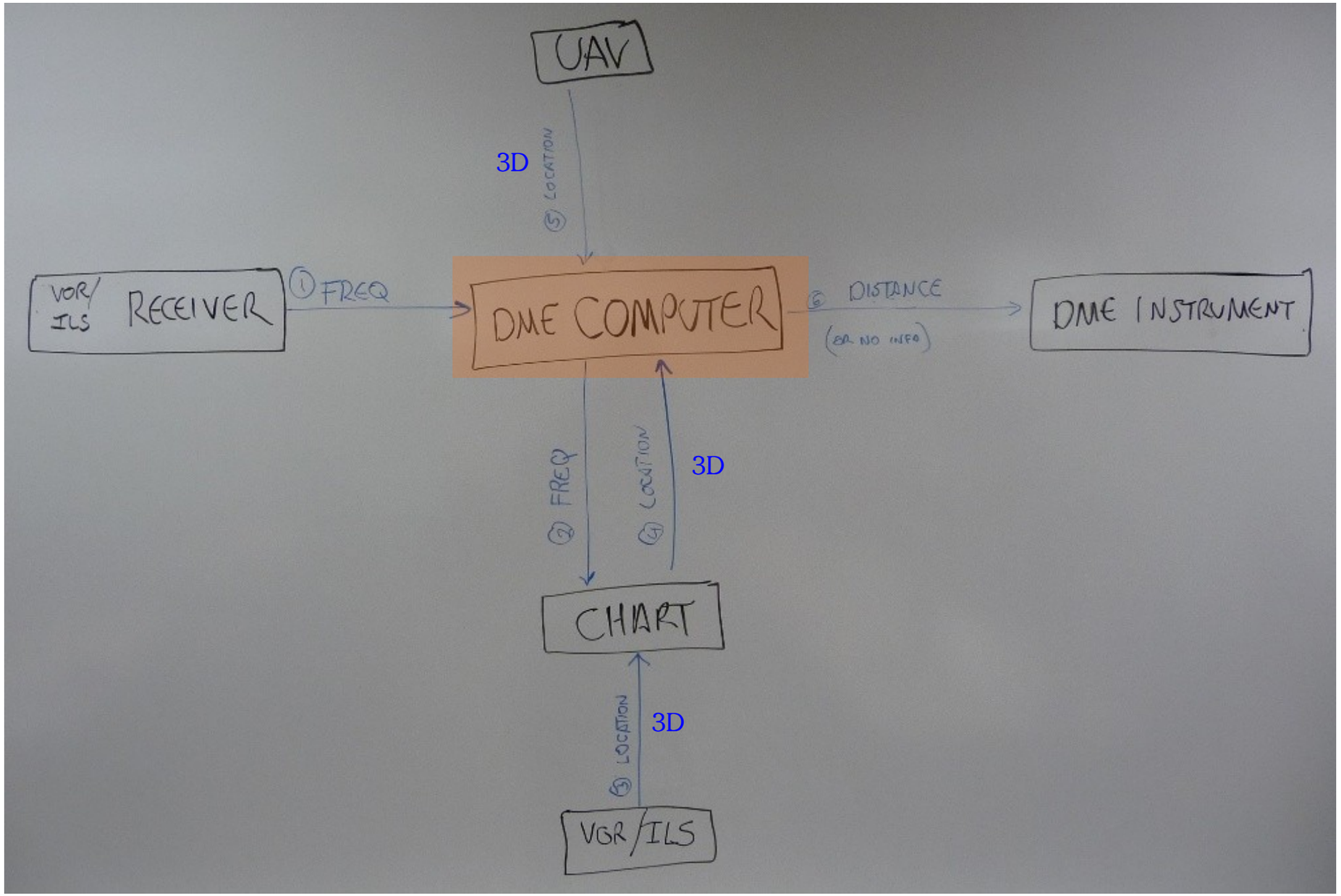


DME Computer



ILS Computer

complexity related to
arc count