

Startup to Mature Company: Tips & Techniques

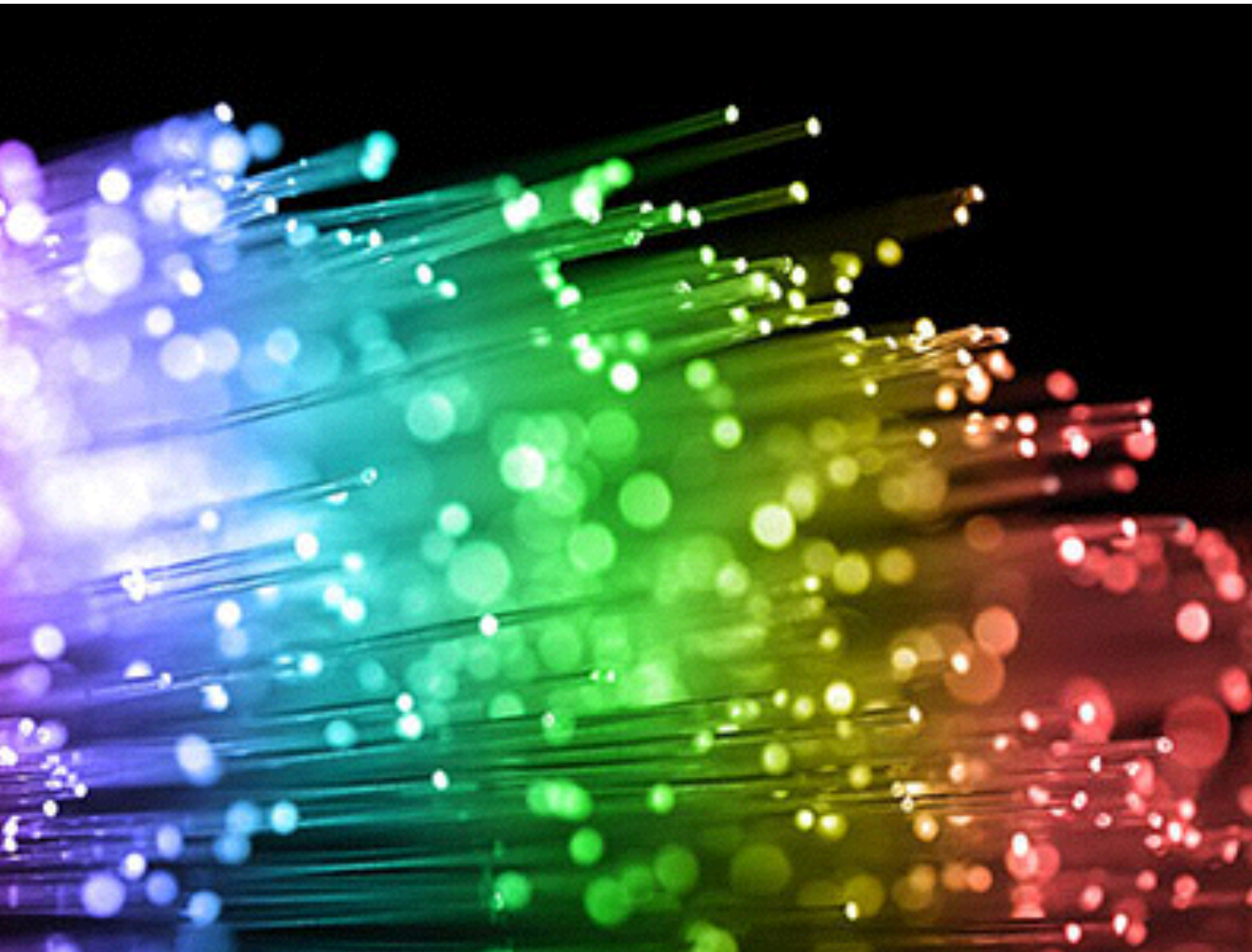


Adapt or Die!



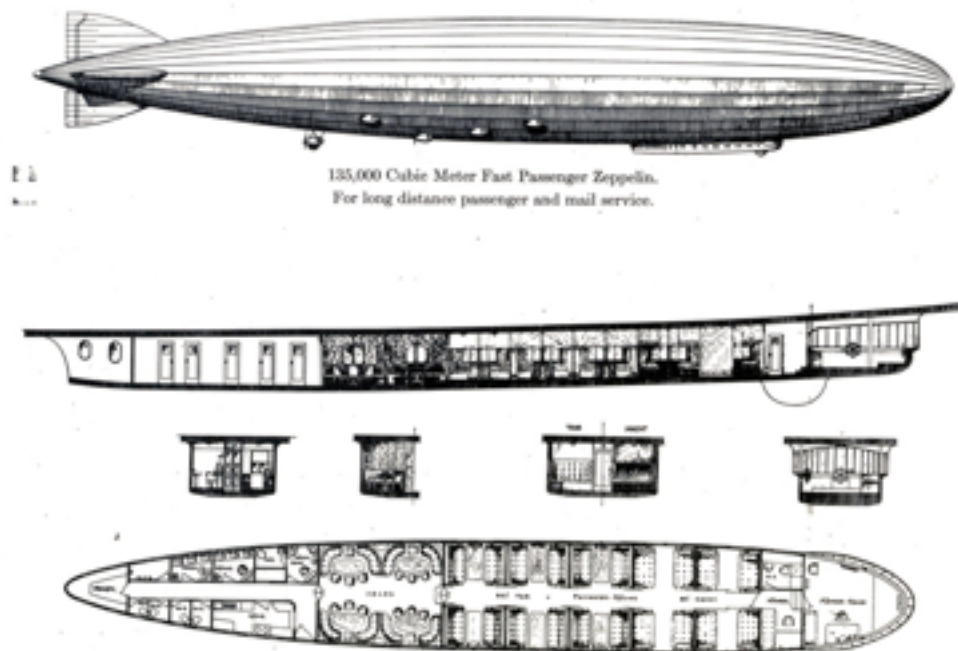
- VC, 2 founders
- Part of Fujikura, 80 employees
- In Optical Communications
- Tough, fast-moving, exacting
- Startup processes no longer work!

“A Giant Particle — By Microscopic Standards!”



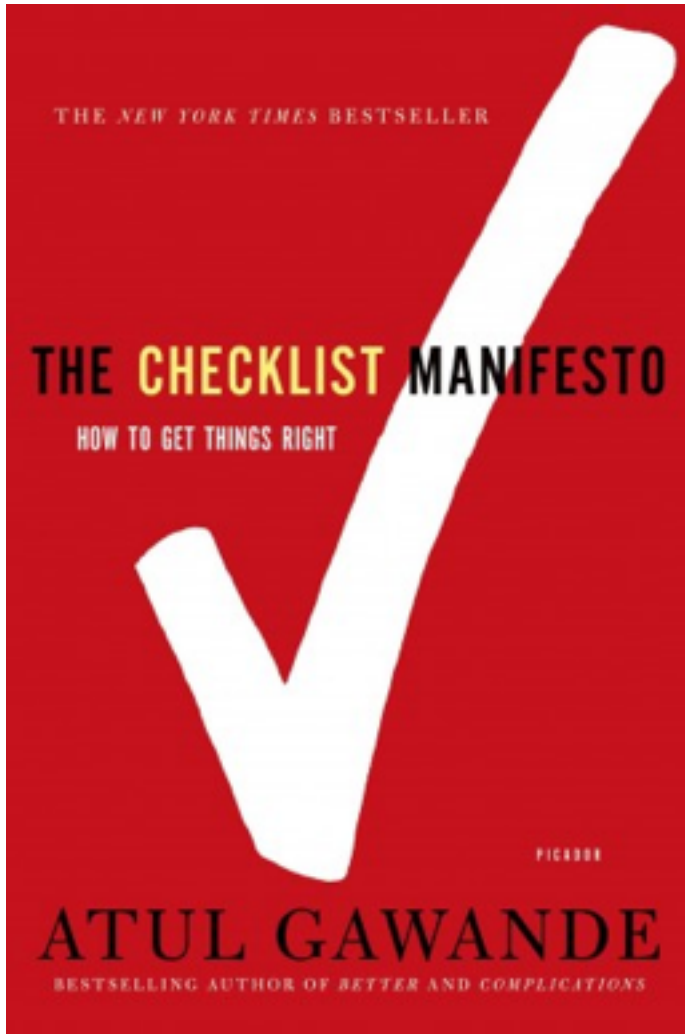
- Internet runs on optical fiber
- Many channels on each
- Need to merge
- And split
- Like trains switching tracks

What is a Zeppelin?



- Manufacturing Database
- Drives manufacture via automated checklists
- Work flow management
- Training checks
- Module data
- Customer datasheets
- Process engineering

Checklist Manifesto

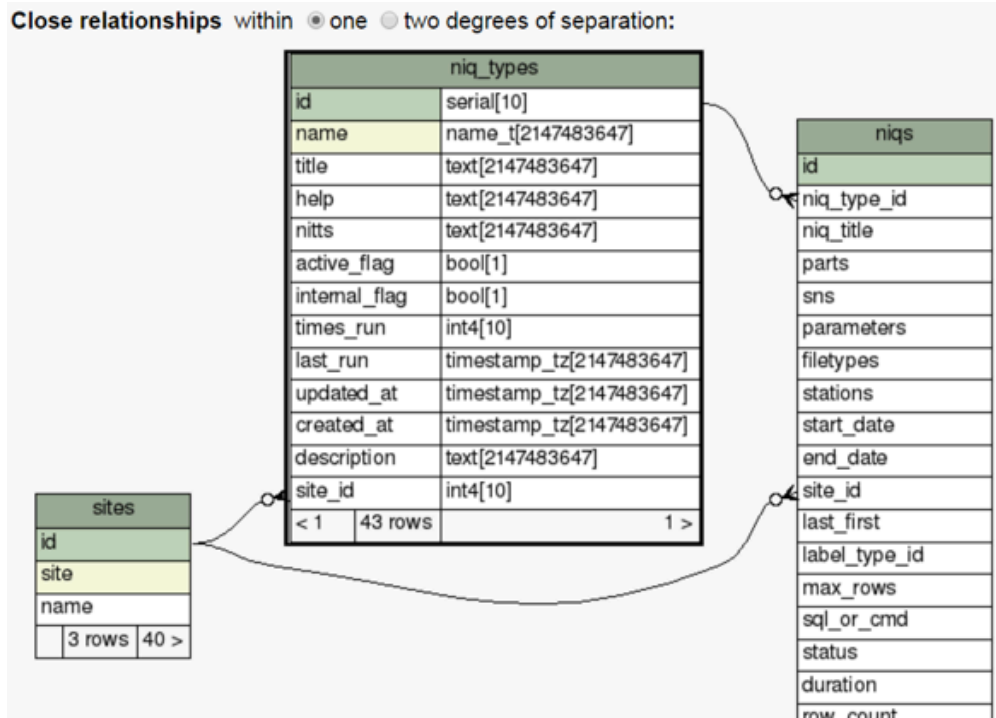


- Getting the basics right
- Every time
- In ICU, 5 steps to insert line
- Infection rate from 11% to 0

How to design a database

- ***Listen*** to the client talk about their business
- Where they use nouns, use tables.
- Where they use verbs, use functions.
- Turn their adjectives into columns,
- and their adverbs into the parameters for the functions.

It's about the relationships



- Like nouns, tables only valuable in combination
- Foreign keys
- Bones and tendons
- Documentation
- Performance

Keys are primary

```
CREATE SEQUENCE
serials_id_seq
  START WITH
1000000000
  INCREMENT BY 1
  MINVALUE
1000000000
  MAXVALUE
1249999999
  CACHE 1;
```

- Anonymous
- Natural keys
- Sequences
- Fast enough for temp tables
- And can set ranges in useful ways

Time to pull the trigger

```
CREATE TRIGGER  
serials_timestamp  
BEFORE UPDATE ON  
serials FOR EACH ROW  
EXECUTE PROCEDURE  
timestamp_trg();
```

- Timestamps
- Keep scope limited
- Complex validation
- History
- Error trapping

Stored Procedures - Muscles of a Database

```
CREATE FUNCTION timestamp_trg() RETURNS trigger
LANGUAGE plpgsql
AS $$
begin
  /*
    force timestamps
    -- created_at & updated_at fields exist
    -- set Model.record_timestamps = false;
    -- this keeps ActiveRecord from trying to do the
update
  */
  if new.created_at is null
  then
    new.created_at = now();
  end if;
  new.updated_at = now();
  return new;
end;
$$;
```

Staying true to type

```
CREATE FUNCTION
sn_process(sn0 sn_t, stuff
description_t)
    LANGUAGE plpgsql
    AS $$
    declare
        sn1 sn_t;
        serial_id1 serials.id
%type;
        top_serial_id1
serials.id%type;
    begin
```

- Rich type system
- Induced types
- Defined domains
- Conversions
- General functions

Character Encodings

```
Set  
client_encoding  
to 'LATIN1';
```

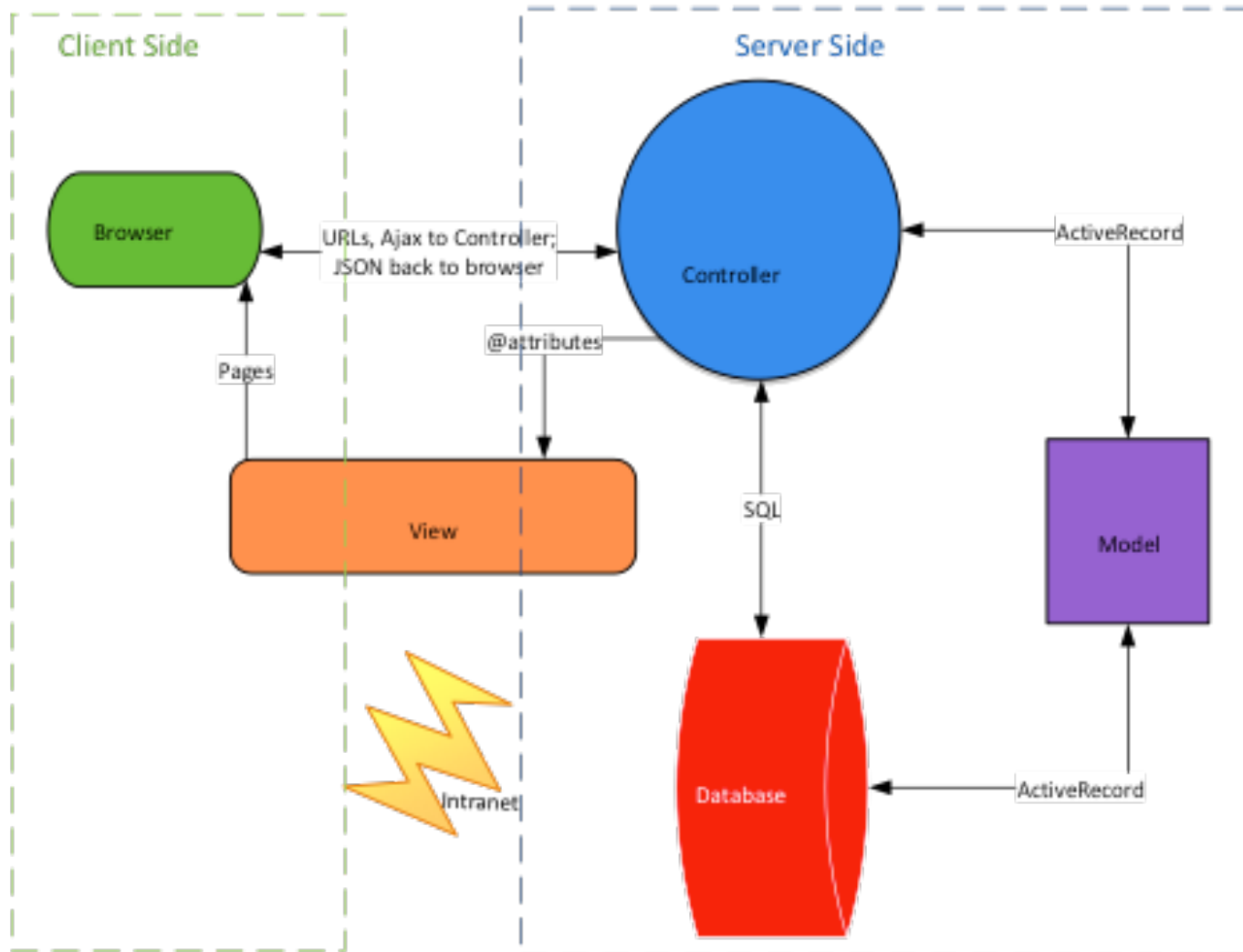
```
convert('string',  
'LATIN1',  
'UTF8');
```

- UTF8
- SQL Server/LATIN1
- Engineering symbols
- Vietnamese

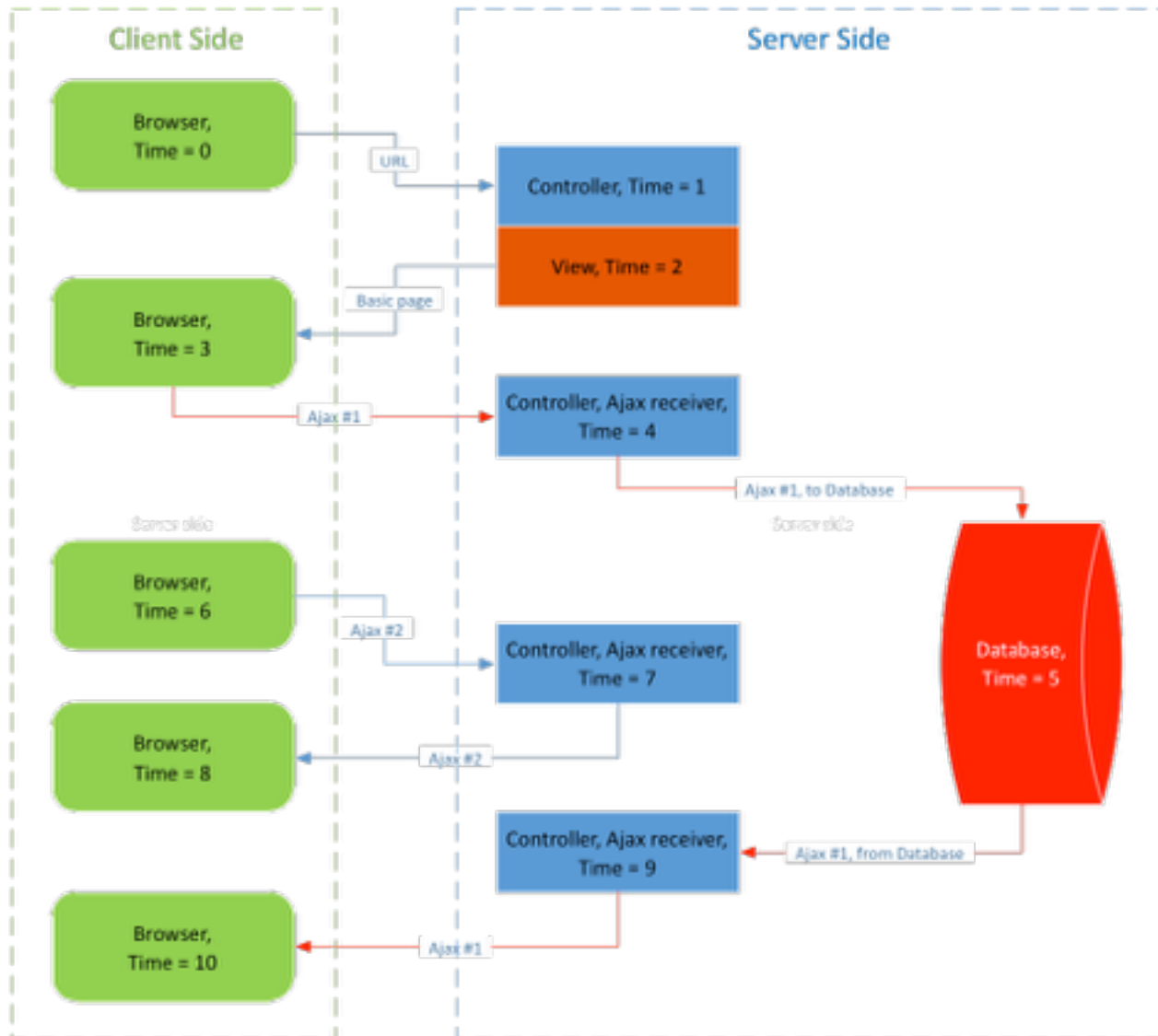
Metadata

```
select a.attname
      from pg_catalog.pg_attribute a,
           pg_catalog.pg_class c,
           pg_catalog.pg_namespace n
     where a.attrelid = c.oid
           and c.relnamespace = n.oid
           and c.relname = ?
           and n.nspname = 'public'
           and a.attnum > 0  -- gets rid
of internal columns
           and a.attisdropped = 'f'
     order by a.attnum
```

Model-View-Controller



It's about the conversation



- KISS
- Separation of concerns
- DRY
- Right tool
- Local standards

JSON

```
response = {
  "result": "OK",
  "number_of_serials": 3,
  "message": "We found three
serials",
  "serials": [ "SN1", "SN2",
"SN3" ],
  "details": {
    "retrieved_on": "2018-01-01
03:17:04",
    "length": 1003
  }
}
```

- Compact
- Easy to read
- Native in PostgreSQL
- Frozen JavaScript

Crash reporting



- No exceptions
- Be specific
- Leave log entry
- Notify IT
- Tell the user what to do next

The Bent Pyramid



- Started at 52 degrees
- Abruptly cuts back to 43
- Next time, they dug down to bed rock!

Death to Yellow Stickies



1. *Explicit ask*
2. *Prioritization & scheduling*
3. *User Stories*
4. *Flow chart.*
5. *Induced Requirements*
6. *Validation.*
7. *Site specific issues.*
8. *System impacts.*

Start with the help

List of reports

This includes active and planned reports.

The NITTs column is list of specific Nistica Tracking Tickets that are associated with the query (usually the original request plus some followups).

Active queries are ones that we've already built. Inactive queries are ones we are thinking of building (or have already retired).

Report	Description	Active	Internal Role	Last Run	# Runs	BTs/NITTs	Site	
Alldata	Standard list of data values. Query by SNs, Parts, Stations, range of dates, and site	ACTIVE		2018-01-10	843	6680	All	Edit alldata
Correlations	Compute correlations between parameters for related parts	INACTIVE				2032 2164 2230 2269 2304	All	Edit correlations
Cycles	Cycle counts by SN: first use, last, # of days in service, and so on.	ACTIVE		2017-10-12	18	3059	All	Edit cycles
Data	Data values in a cross tab format. Search by SNs, Parts,	ACTIVE		2018-01-15	2201	2686 3256 3258 5188	All	Edit data

I have a syncing feeling about this...

Sluggish connection haunts Vietnam users again as submarine Internet cables encounter problems

Two out of three submarine cable systems essential to Vietnam's international connectivity have been affected this week

By Tuoi Tre News October 12, 2017, 15:55 GMT+7



A diver is seen fixing a submarine cable cut in this file photo.

- Hub & spokes
- Technical problems
- Push model
- Positive verification required!

2B or Not 2B

YELLOW FLAG REPORT FOR OMNIFY TO ZEPPELIN SYNC

Mon Jan 15 20:13:10 EST 2018

19 YELLOW FLAGS:

COUNTS BY AREA

EXCEPTION	1
MULTIPLE_AR	2
NO_ITEM	1
NO_VENDOR_QUALIFIED	1
PARAM_NO_SPEC	14

ERRORS WHERE PART IS UNDER ECO:	3
ERRORS FIXABLE (PART NOT UNDER ECO):	16

'**' indicates part is 'under eco'

How to fix a yellow flag:

<http://172.16.1.23:8080/redmine/projects/zep>

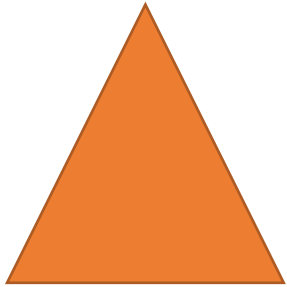
How to build a CSV:

<http://172.16.1.23:8080/redmine/projects/zep>

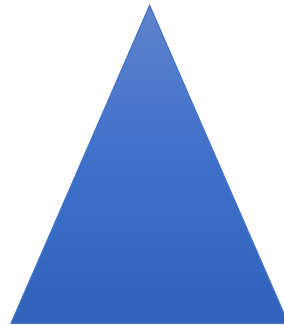
- Engineering DB in SQL Server
- 2B or Not 2B
- LATIN1
- Different organization

Some Assembly Required

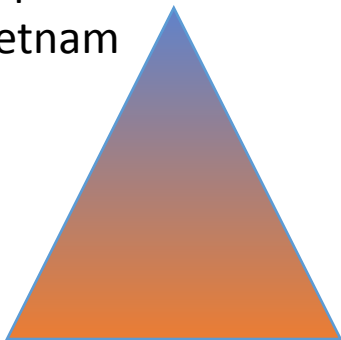
Start in Vietnam



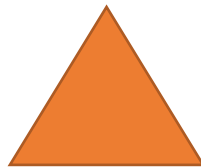
Go to NJ



Ship Back to
Vietnam



Replace Sub-assembly



- Parts in assembly travel together
- But when you pull part out?
- And move it back?
- Some thought required!

Other processes



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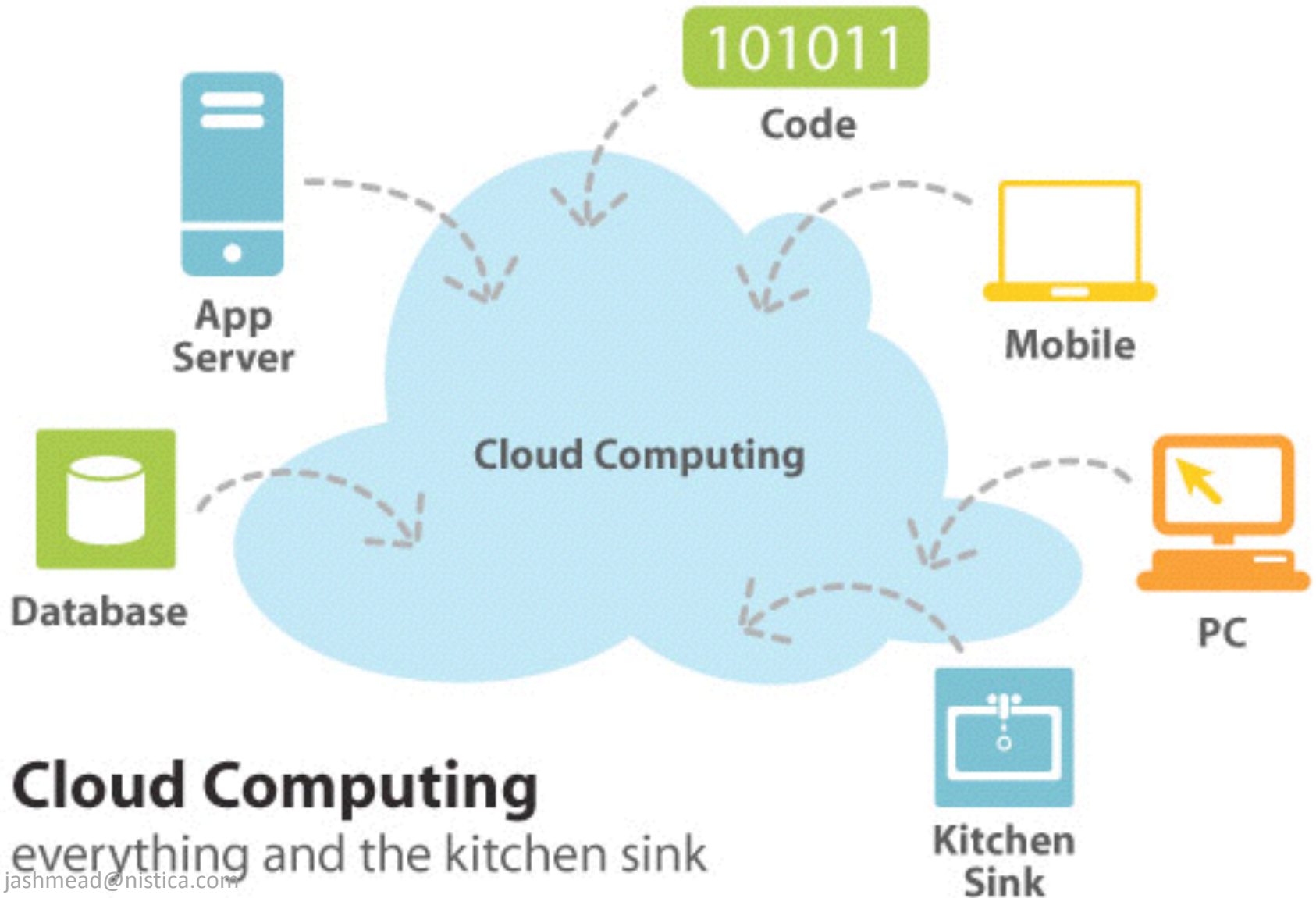
- Log collection (Argus)
- Redmine — Change control system
- Bugtracker — Trouble tracking system
- Zeppelin Tool Construction — Process documentation
- Development & test servers
- ...

Ten principles for software development

No document like this is complete without a list of “ten principles”. Herewith:

1. Above all, do no harm.
2. Do not repeat yourself.
3. Maintain “separation of concerns”.
4. Trust no one.
5. Respect the user.
6. Don’t reinvent the wheel.
7. Think globally, act locally.
8. Say what you mean.
9. Stand well back from the bleeding edge.
10. These are guidelines, not rules.

And now cometh the cloud



Alfred North Whitehead



“Civilization advances by extending the number of important operations which we can perform without thinking of them.”

What next?



- Blogs
- User groups
- Email list
- Books
- Reference manuals

Thank You!



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