DEVELOPING AN ENGINEERING CULTURE

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Applicable scenarios

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Startup / small org – fewer than 20 software engineers.

Almost everybody codes. No dedicated System Analysts / Architects.

Software & services for enterprise customers

Long intended software lifecycle (> 7 yrs)

High interconnectivity between software components

Frequent releases or deployments (< 4 weeks)

Disciplines that work

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Discipline is the soul of an army. It makes small numbers formidable; procures success to the weak, and esteem to all.

Quality is Job 1.

Document interfaces

Learn how to lead

Background

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Video-driven business intelligence – scoring compliance, safety, productivity

Deliver data and alerts daily, hourly, or even under 10 minutes.

Formulate tasks as high-throughput video annotation, organized around sampling

Runs 24x7x365 –review ~60,000 snippets of video every weekday

1. Quality (CORRECTNESS & MAINTAINABILITY)

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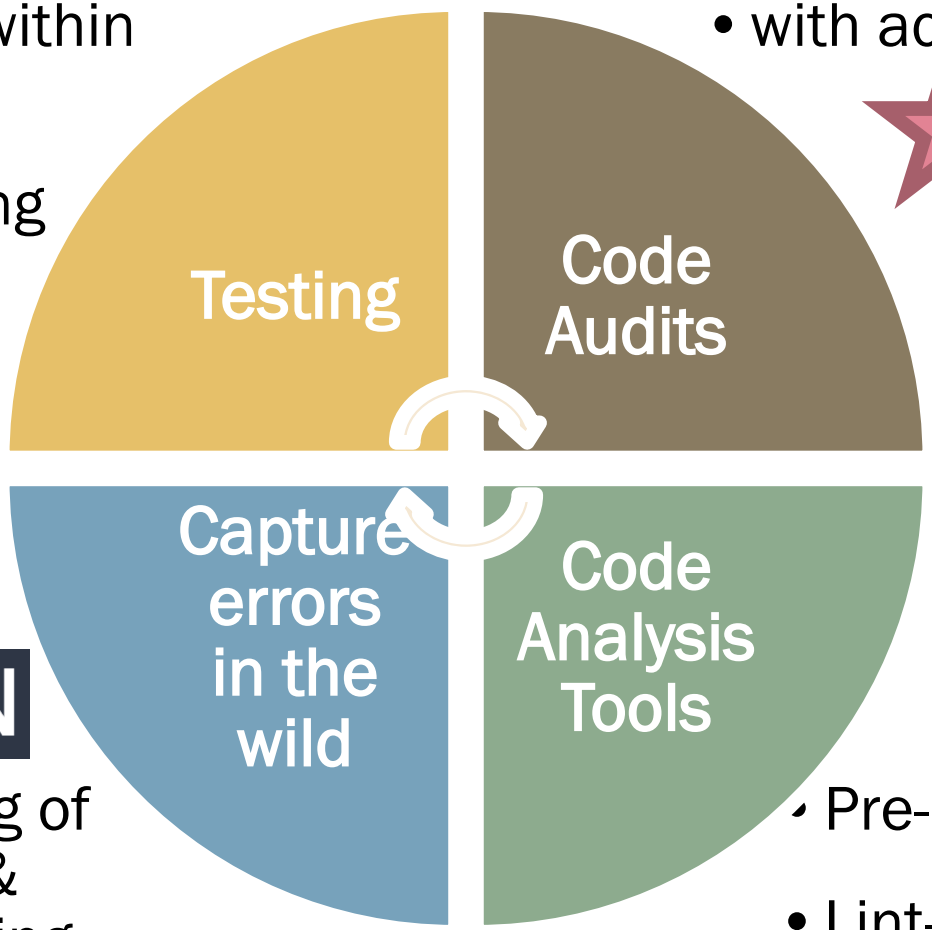
- Automated tests (within CI)
- TestLink for defining and assigning manual tests



- with accountability

RAYGUN

- Centralized logging of client-side errors & exceptions, including JavaScript.

- Pre-commit checks
- Lint-like tools (within CI)

Code Audits

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BOILING A FROG

Why audit? Because good code doesn’t go bad overnight!

(borrowed this meme from a talk at NYC .NET Code Camp)

Making code audits part of culture

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Teach folks how to audit code…

…and how to reach consensus with the author!

Auditors must sign off on code at the file level.

Auditors mark each file as either OK or NEEDSWORK *within the source code control system*

Marking something OK means you feel:

1. **the code is maintainable**
2. **you could debug this code if called upon**
3. **you could extend this code in future without feeling compelled to make major architectural changes**

Quality (CORRECTNESS & MAINTAINABILITY)

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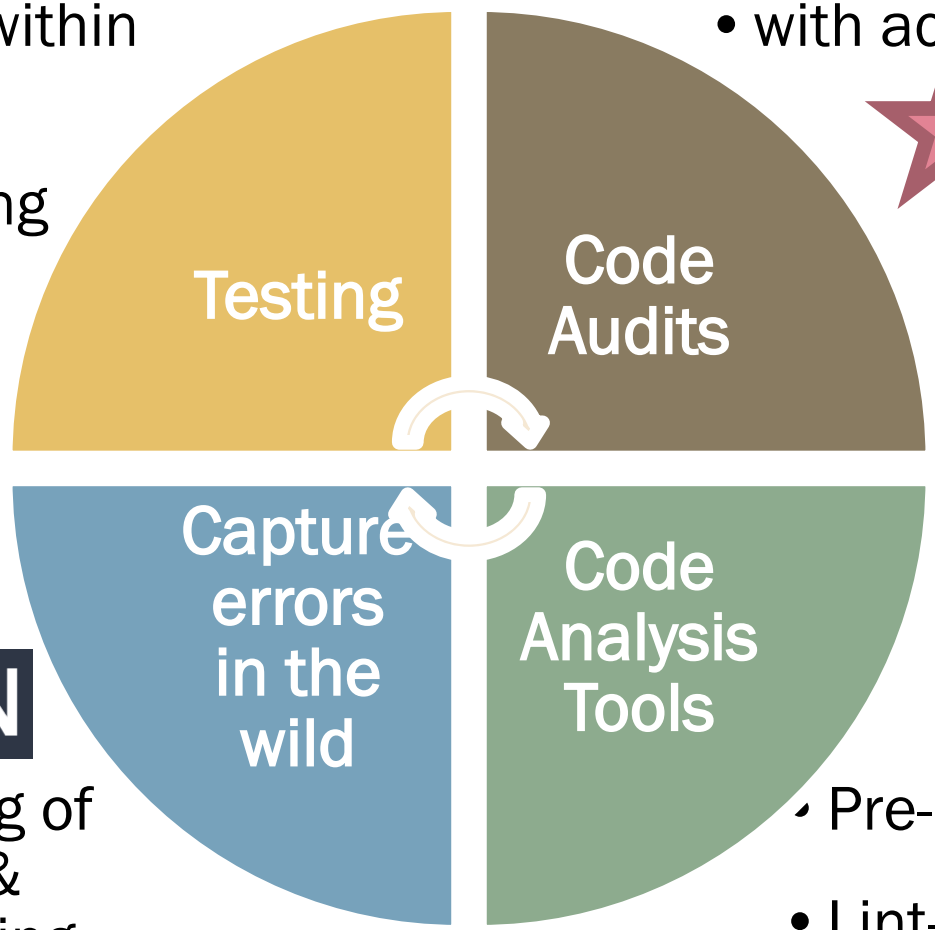

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Pre-commit checks

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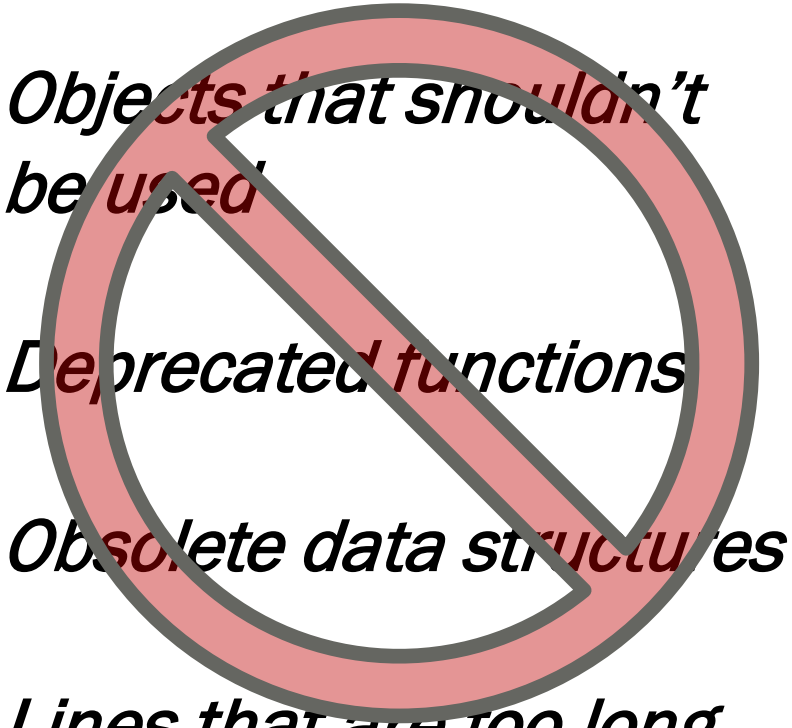
Prevent bad code from ever getting checked in!



Objects that shouldn't be used

Deprecated functions

Obsolete data structures

Lines that are too long

```
<Forbidden lang="CPP"
      string="\b(mktime|mktime32)\s*\("  >
      <FileToExamine name="\.cpp$"/>
      <FileToExamine name="\.h$" />
      <Reason>This function uses local system time zone info.
      Use gmtime_s or gmtime32_s instead.</Reason>
   </Forbidden>
```

```
<Forbidden lang="jscript"
        string="attachEventListener\s*\(" >
<FileToExamine name="\.js$" />
<FileToExamine name="\.cshtml$" />
<Reason>Please remove attachEventListener calls and replace with attachEventHandler.</Reason>
<ExceptionFile name="i_js_HelperFunc\.js$"/>
</Forbidden>
```

```
<Forbidden  lang="sql"  string="(.*)(\bDATETIME\b).*" >
    <FileToExamine name="\.sql$" comment="foobar"/>
    <Reason>
    WARNING: DATETIME is deprecated and discouraged. Consider using DATETIMEOFFSET or DATETIME2
    as appropriate. The only reason to use DATETIME is if required for compatibility with
    existing schema.
    </Reason>
</Forbidden>
```

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2. Document interfaces

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Design docs we use

- Database (.docx)
- Web services API (.docx + .xsd)
- Interfaces on COM objs / .NET assemblies (.docx + .xsd)
- UML for specific concepts (Visio)
  - Activity diagrams
  - State diagrams

Pick doc formats that can be edited even if you don't have the source code!

Example XML schema

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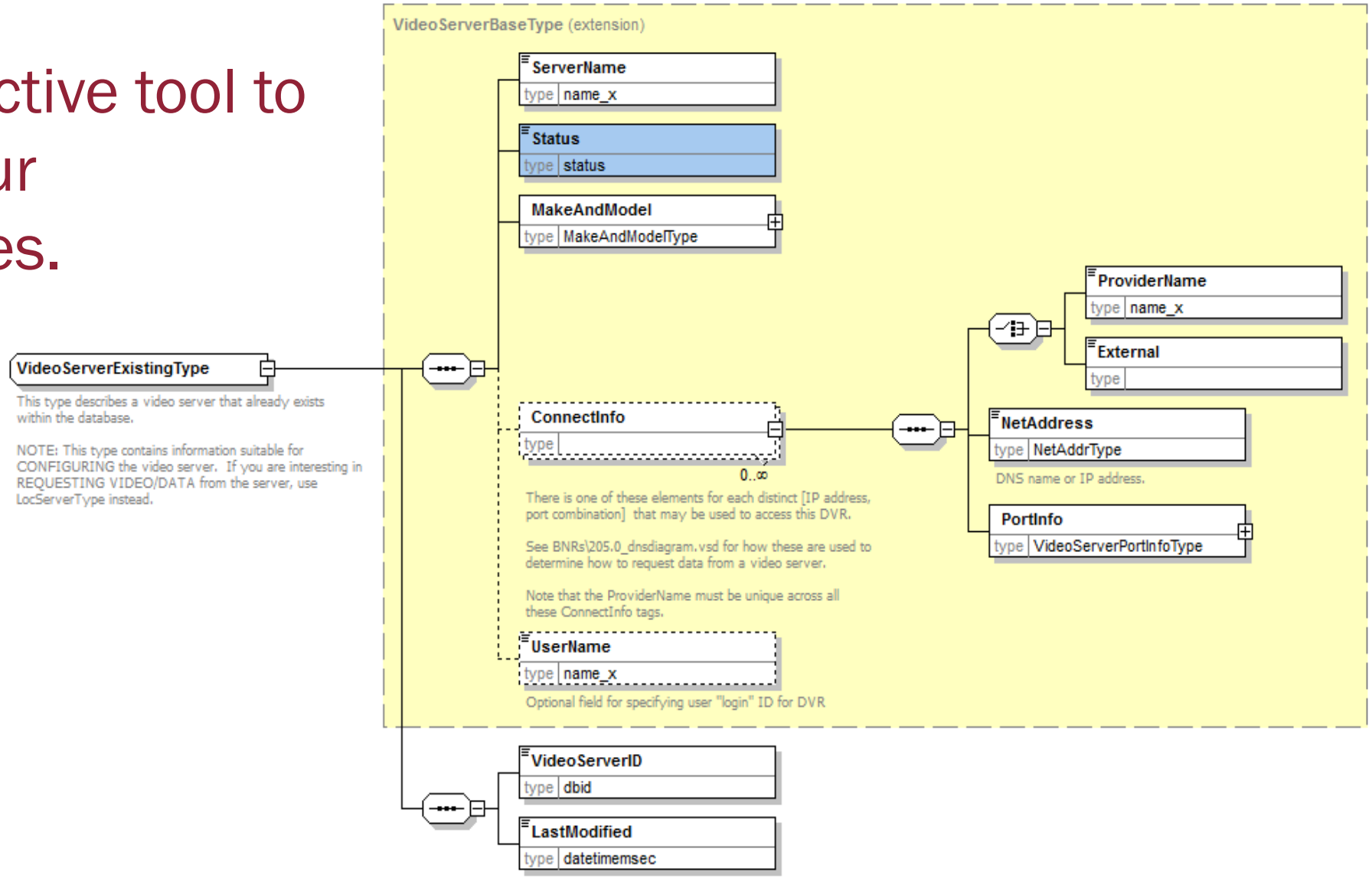
Use an interactive tool to document your data structures.



ALTOVA®

Build a culture of USING the docs

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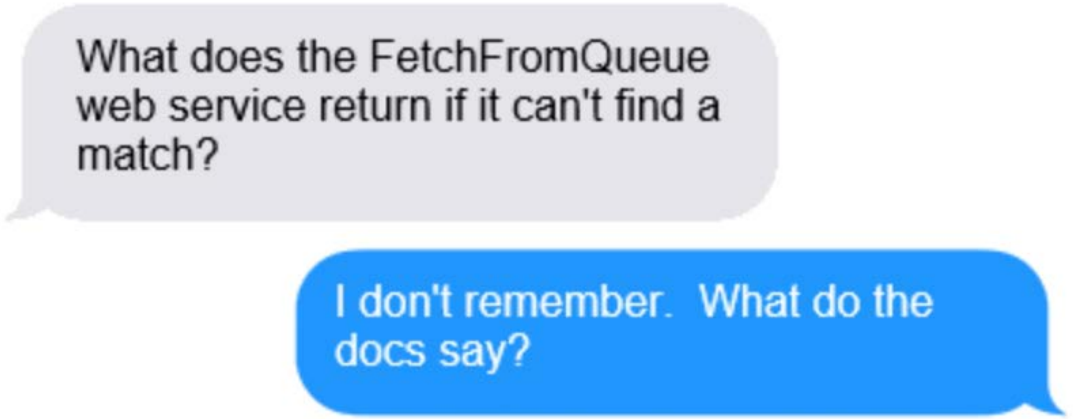
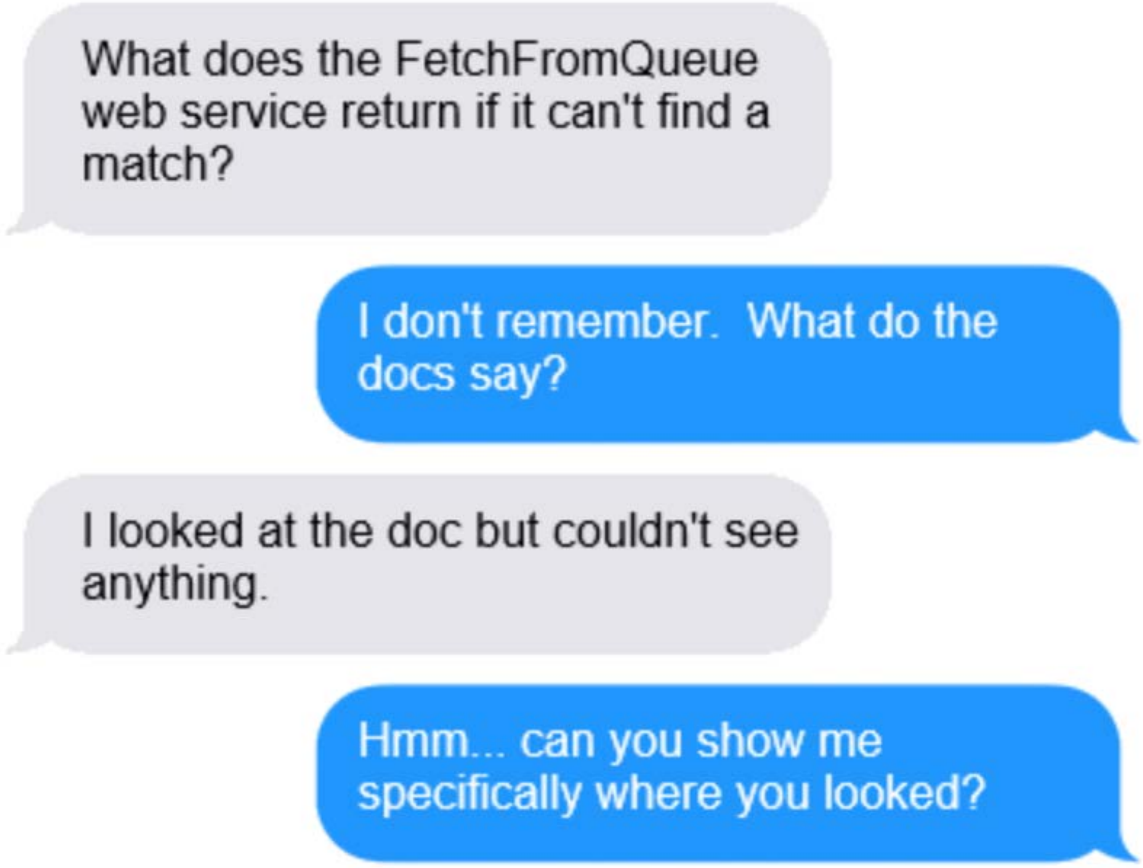
Stage 1



Stage 2



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People stack – SW Engineering Dept

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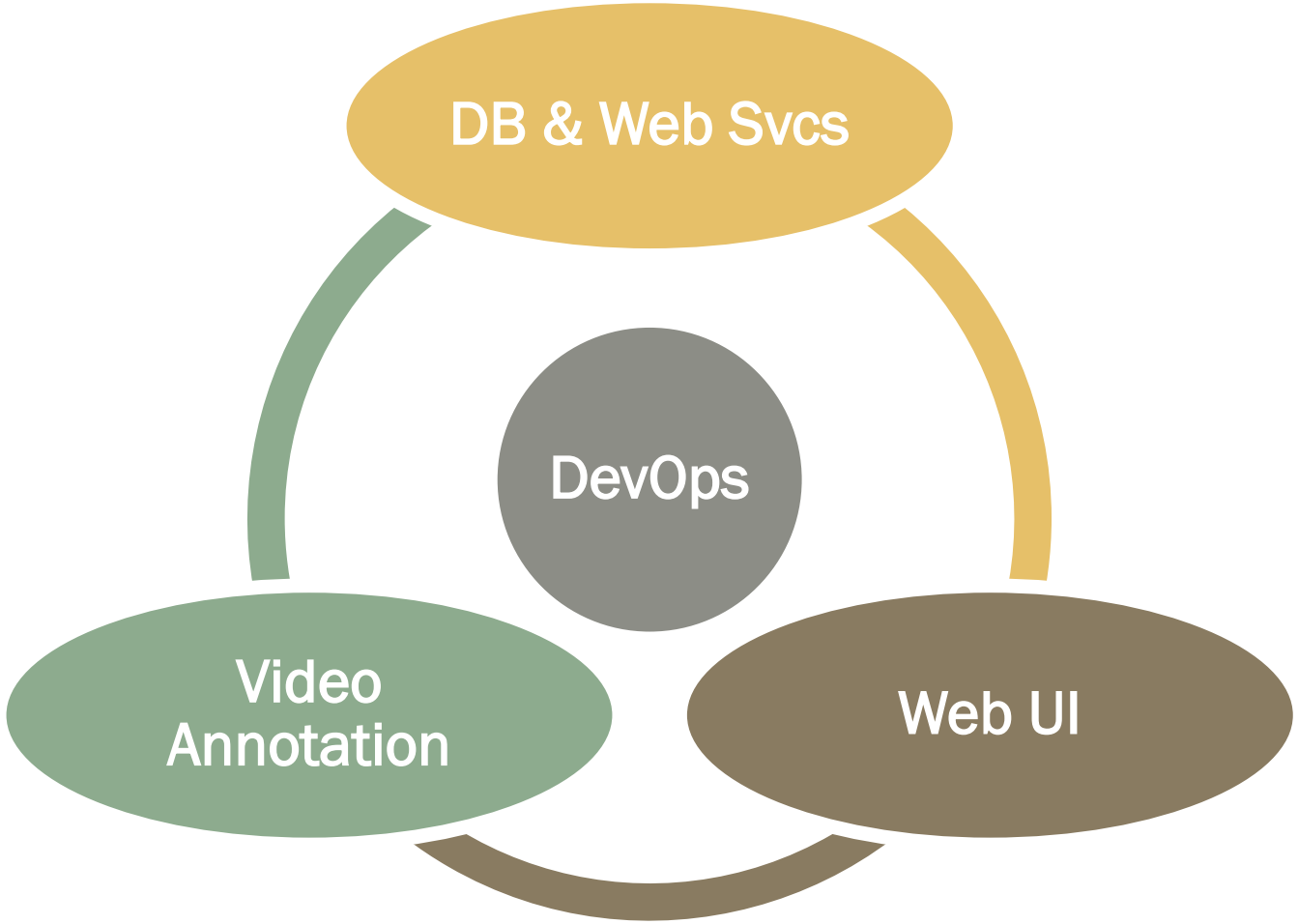

Team Leads
- write code
- have direct reports

Agile
- Daily scrums
- Deploy code to production every week or at least every 2 weeks

3. Learn how to lead

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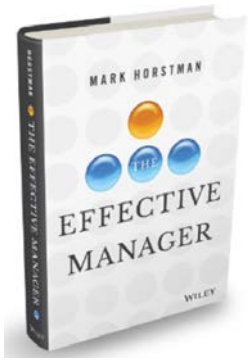
It’s more than "tell folks what to do for the next sprint"!

Besides all the tech,
you’re responsible for:

- retaining your staff
- developing your staff
- recruiting new staff <u>fast</u>

Manager Tools



- weekly 1-on-1s
- feedback, delegation, training, reviews
- networking

manager-tools.com

Contact info

Arrowsight

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About our team, plus job openings: bit.ly/AS-SW

Don’t wait to see an opening – email me directly