A Customer's Experience and Lessons Learned in Evaluating External Leak Detection Technologies

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Definitions

External Leak Detection Systems (LDS)

- Externally based systems also utilize field instrumentation (for example infrared radiometers or thermal cameras, vapor sensors, acoustic microphones or fiber-optic cables) to monitor external pipeline parameters.

According to the API document "RP 1130"

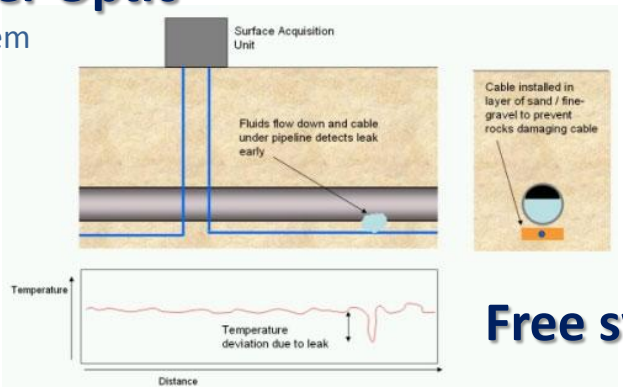
Continuous/Non-continuous LDS

- Continuous Leak Detection systems monitor pipeline state continuously and have automatic leak alarm capabilities, while other methods of leak detection are conducted as part of a regularly scheduled maintenance program and rely on daily visual inspections for evidence of initial leak detection.

Leak Detection Technologies

Fiber Optic

- DTS System
- Acoustic

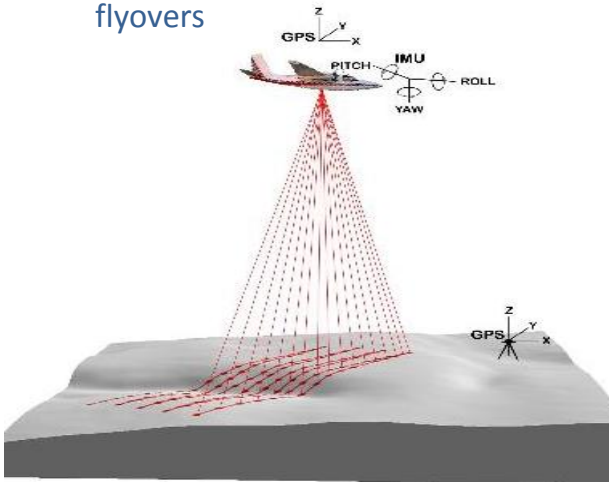


Gas Pressure Tube

- Air sampling Systems

Aerial Technology

- Laser based technology for flyovers



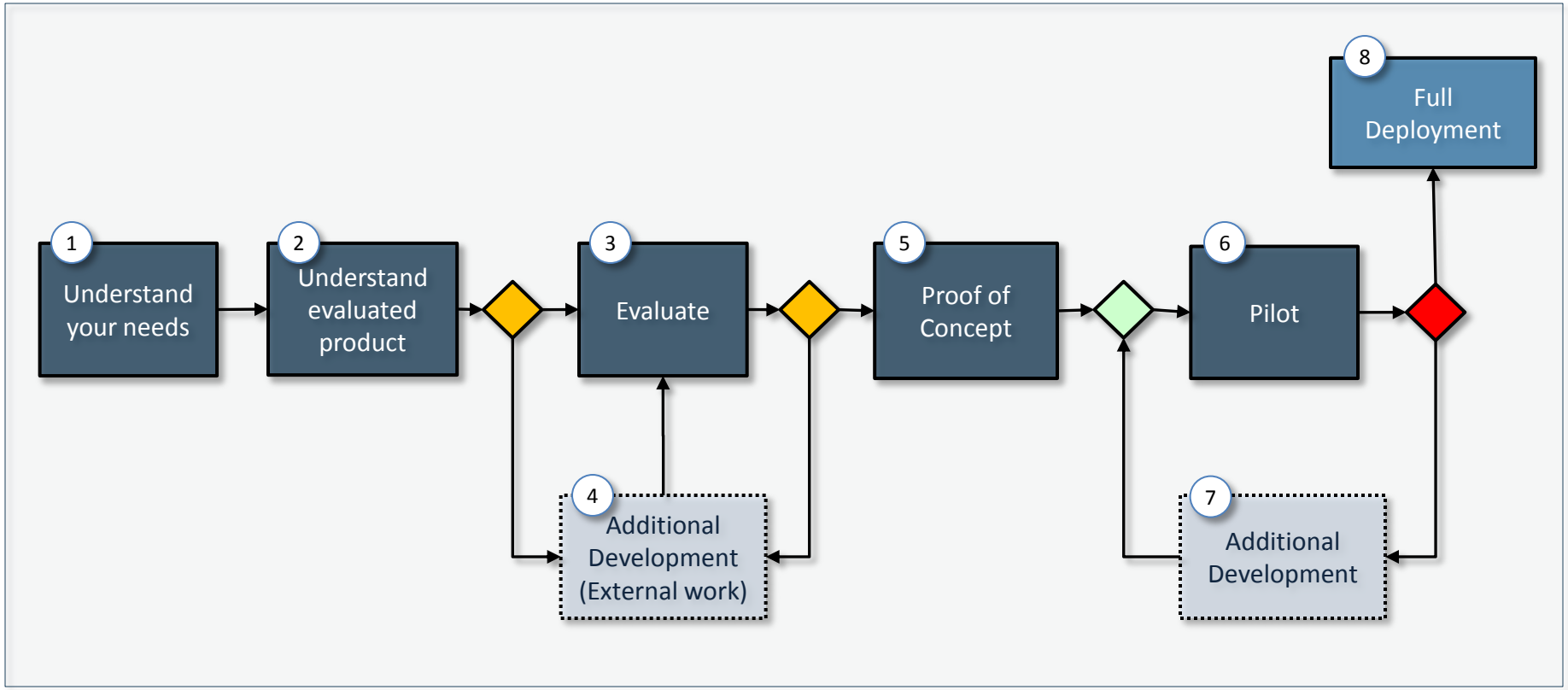
Free swimming acoustic sensors

- Acoustic sensor sent through pipe
- Can detect small leaks (not real-time, battery life is an issue)

Thermal Cameras

- Mobile camera with intelligent detection

Evaluation of External LD Technologies



Understand your needs

To Do:

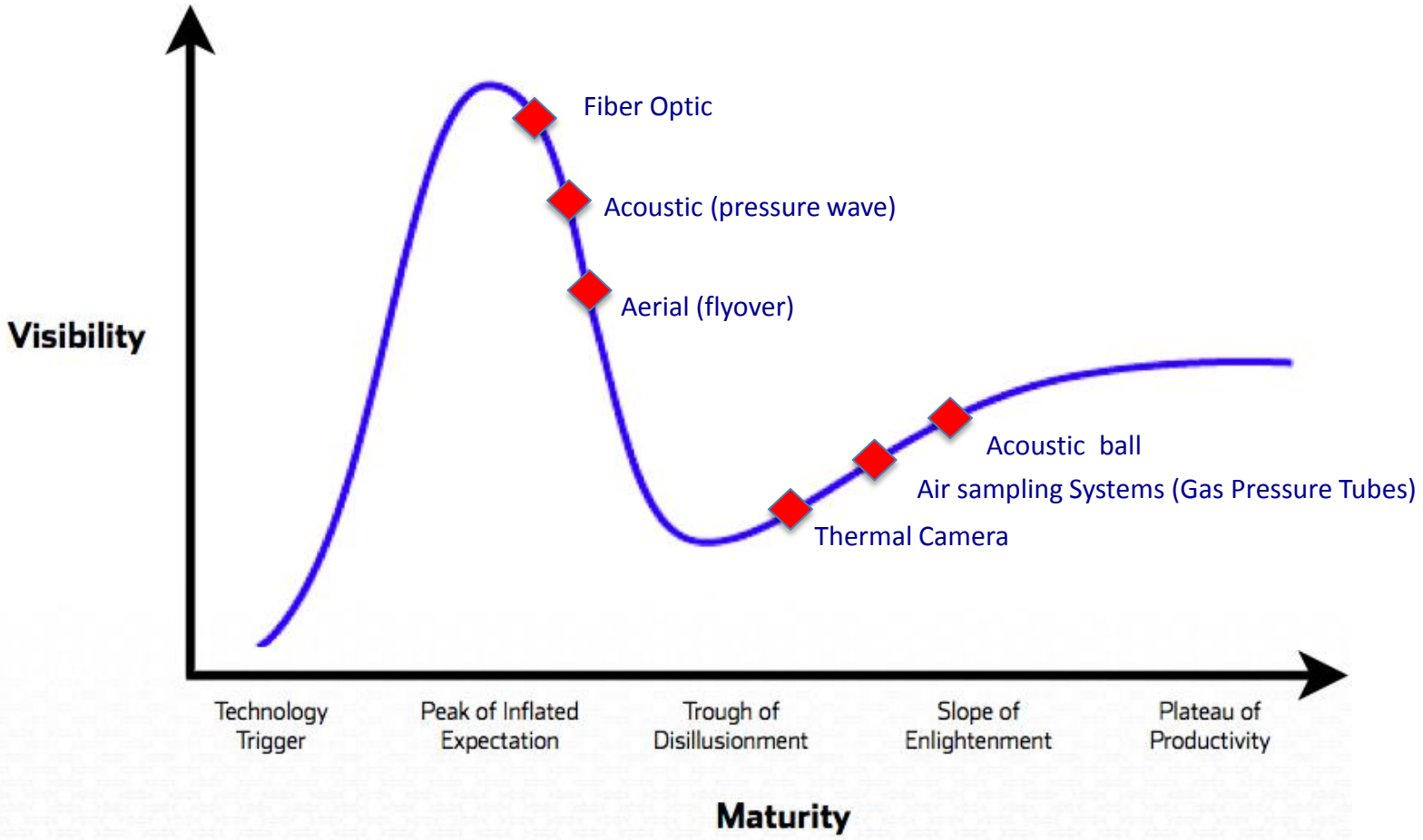
- Understand your gaps
- Define your goals and requirements
- Understand your time constraints
- Define your financial constraints
- Consider the limitations of your current systems
- Take into account your human resource limitations
- Think out of the box

Not To Do:

- Do not rush into evaluating new a technology because it sounds promising
- Do not be blinded by excitement

E.g. Acoustic and Flyover

Gartner Hype Cycle



Source: Gartner. The hype cycle.

Understand technology and its application

To Do:

- Do your research to understand the technology and science behind the solution/system
- Assess the maturity of the technology and the vendor
- Understand the differences and limitations of continuous and non-continuous leak detection systems
- Understand the major companies in the field
- Most importantly, find out how widely the technology been adopted (other clients? is this a cutting-edge technology that no one uses? etc.)
- Have a healthy level of skepticism in regards to system claims

Not To Do:

- Don't take everything you read or that was presented to you for granted

E.g. Acoustic, Flyover and Intelligent Cameras

Holistic view

To Do:

- Think big picture
- Understand other departments' needs
- Look for trends or opportunities
- Collaborate with other departments or companies

Not To Do:

- Do not work "in a bubble"
- Do not ignore what was done before (by other vendors, companies, etc.)

E.g. Smartballs and Intelligent Cameras

Execution

To Do:

- The evaluation of a technology should be treated as a project
- Take a phased approach
- The key to successful projects is to have the right resources (Subject Matter Expert in the Technology)
- As in any research project, be ready to be flexible and to adjust your course during execution (potentially even kill the project)
- Collaborate with organizations that have experience in this area
- Design your experiment with focus on your high impact requirement

Not To Do:

- Do not try to test every possible situation in one shot
- Do not let vendor turn your project test site in a R&D ground

E.g. Acoustic

Reality check

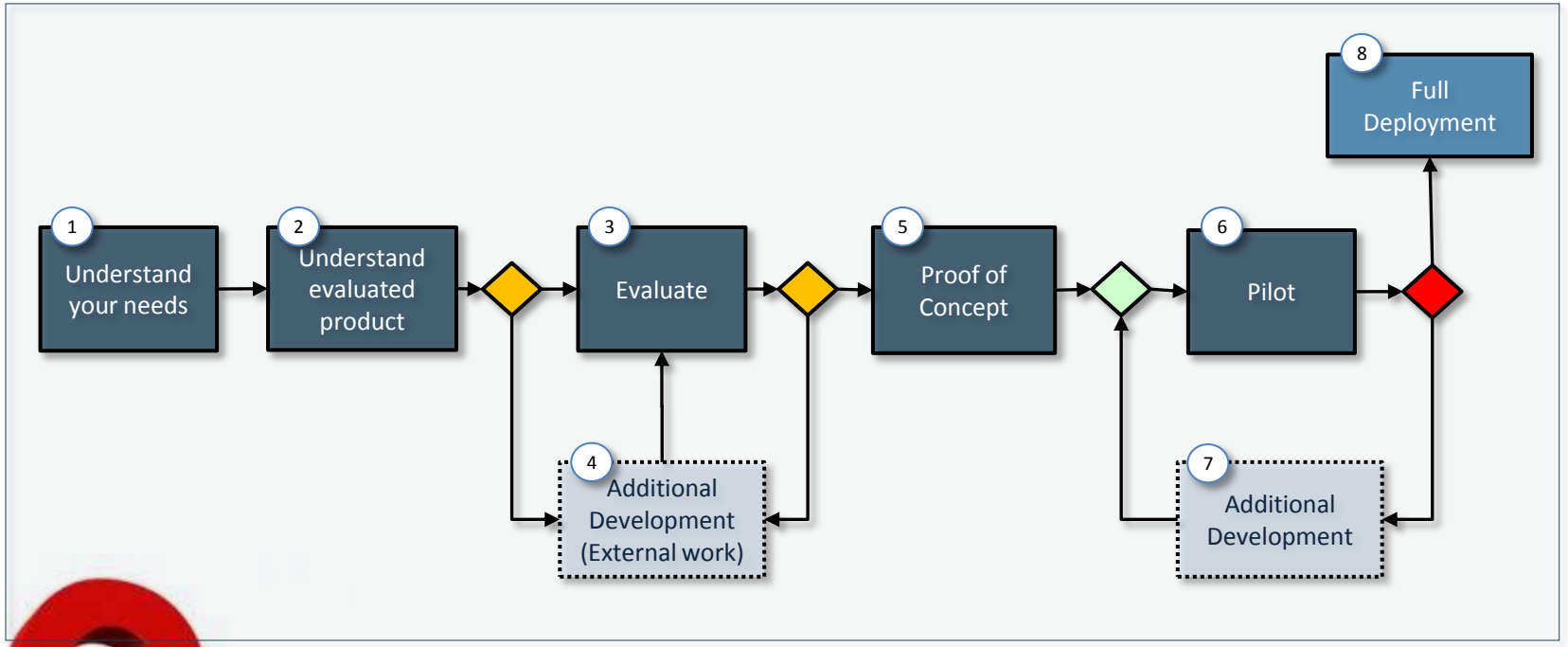
To Do:

- Test, test, test … and carefully review your work
- Than perform an integrated test again

Not To Do:

- Do not be afraid to abandon the project if it is going into the wrong direction or it does not meet your requirements
- Avoid temptation to create or find an universal system

E.g. Flyover


1
Understand your needs
2
Understand evaluated product
3
Evaluate
4
Additional Development (External work)
5
Proof of Concept
6
Pilot
7
Additional Development
8
Full Deployment