Implementing Inspections at AirTouch Cellular (now Verizon Wireless)

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1

IT organization at AirTouch in early 1999

- Merger of three prior companies
- Development in
  - Bellevue, WA
  - Columbus, Ohio
  - Walnut Creek and Irvine, CA
- Three sets of systems; different platforms, languages and databases at the three sites

2

Why introduce inspections?

- AirTouch has a 'team award', a bonus scheme
- Bonus is based on a formula set up each year
- For 1999, one component depended on having 98.5% correct bills sent to customers
- Not likely to make this goal, unless we improved our processes – accuracy was 86.3% in February for Bellevue

3

New practices introduced

- Floyd Alcorn, Director in Bellevue, introduced three new practices
  - 1) bill review – of selected set of customers, before bills mailed
  - 2) inspections
  - 3) independent testing group (never was one before)

4

Time line for introducing inspections

- January 1999, began planning
- Initial training in early March, by Steve Tockey of Construx
- Inspections to start right after training
- Training was required for both contractors and employees; attendance was tracked

5

Lesson Learned 1: Checklist development

- Takes more time than you think it will
- You have to draft a lot of them! In a large company, lots of languages, databases, job control languages etc.
- Need specific checklists
- Still have less used checklists that need development

6

Checklist development, cont.

- We inspect all important documents: project plans, project charters, requirements documents, test plans, etc. as well as code
- This results in a lot of checklists to develop
- Methodology project developed checklists along with doc templates

7

Lesson Learned 2: After initial training…

- We waited for inspection paperwork to arrive – none appeared
- How to get people to turn in paperwork?
- Set up a metrics program which would track whether inspections were being done and collect data on time expended, total issues found

8

Metrics

- We tracked how many inspections should be done using our change request system, since mostly small coding changes in 1999 (due to big convergence project)
- Also tracked time spent in prep and meeting; issues found; outcomes
- Gave metrics report to managers each month

9

Management support

- Floyd is a strong manager who made doing inspections mandatory
- Managers under him supported this
- But:
  - People were arguing they didn't need to do an inspection because 'they were only changing a few lines'

10

Lesson Learned 3: Inspection Policy

- Put out an inspection policy that said ALL changes had to be inspected, even one line changes
- Otherwise everyone thought it didn't apply to them
- Managers backed us on this

11

Metrics, con't

- Were careful only to give aggregated data to managers
- Except, told them which staff members didn't turn in paperwork, even with a reminder to do so
- Compliance got much worse in September

12

What happened in September?

- In retrospect, it was simple!
- We have a long year end freeze, to have stable systems during our biggest sales season – no changes allowed unless really necessary
- Because of the freeze, most changes were emergency, prod abend type changes
- People weren't inspecting these – this contributed to never getting 100% compliance

13

What did we do?

- Worked with each group to find a solution – wanted emer fixes inspected even if after the fact
- One group inspected emer fixes at a weekly production support meeting; others used another process
- We didn't dictate how they did it

14

Compliance results

- The person collecting the metrics tries to get all the paperwork
- He contacts people if not turned in
- It took until February 2000 to have 100% paperwork turned in.

15

Summary of results so far

- We've done 807 inspections through December 2000
- Average time per inspection (prep + meeting) is 4.5 hours

16

However….

- 2000/1 isn't like 1999. We have bigger projects, which have more docs to be inspected, not just small code changes
- Need another way to get 'opportunity to do'.
- Working on this with project managers

17

Meanwhile, going back…

- In June 1999 Earl Beede became QA/QC manager for the big convergence project
- Inspections were required for convergence
- Suddenly many more people needed to be trained, and they weren't all in Bellevue

18

Convergence Project

- Couldn't train everyone by the time inspections needed to happen
- Needed to do inspections where people were geographically dispersed
- Doing inspections with untrained participants worked pretty well if trained moderator led the inspection, helped set it up, and gave short intro at start of meeting

19

Convergence project, con't

- Project was cancelled in October, due to announcement of joint venture with Bell Atlantic
- At this point most parts of the project were finishing requirements; some into design

20

Lessons learned

- One group of project managers refused to inspect their requirements docs because they'd already been signed off (QA/QC started later than the project start)
- Inspected them along with related design docs in September
- A mistake! Many unidentified problems in requirements docs caused design docs to be even worse – basically toss them out and start over

21

Results of Convergence inspections

- 38 documents inspected in 19 inspection meetings
- Avg 12.3 hours per deliverable, spent in prep and meeting
- We estimated the cost to do the inspections was $46,740 and the savings from 192K to 2556K depending on how long the error would have remained

22

Once convergence was cancelled, then what?

- Lots of people all over the company had done one or more inspections
- They had a track record not just in Bellevue
- Directors had local people they trusted who said 'inspections work'
- Contacted all IT Directors with question: do you want to continue to do inspections?
- Worked with those who said yes

23

All support people for inspections were in Bellevue

- We didn't want it this way
- Hoped to hire people in other geographical areas
- We have to work to overcome the idea that Bellevue is trying to impose something on the other groups; involve them in checklist development etc.

24

Successful in Ohio

- Good support from director in Ohio
- Similar group to one in Bellevue – Director was Mike Kennedy
- We flew to Ohio to train them several times; built relationships
- Had a monthly moderators meeting which includes them

Successful in Ohio, cont.

- They are collecting metrics similar to Bellevue's
- Inspections are institutionalized there
- Joint venture with Bell Atlantic started early April. Ohio is now in different area, under different VP. Little contact since JV.

Other groups?

- Engineering group is starting to do inspections; not as institutionalized as Floyd's group and Mike Kennedy's
- Trained IFOS group in Walnut Creek and they are doing inspections
- Irvine not doing it at all
- No support in Internet, Data Warehouse, and ERP group
- Had vision of eventually implementing everywhere in AirTouch; probably impossible to do this across Verizon

Other problems

- AirTouch had business analysts, who gather requirements, in a separate organization from developers
- Leadership of that org had designed a Fagan inspection process in 1993
- Wouldn't agree to our process; not enough like Fagan: 'wasn't an inspection'
- We needed requirements docs to be inspected!

Solution

- We continued to work with them to address their concerns
- Finally got agreement just before joint venture which became Verizon
- Verizon doesn't have business analysts in separate stovepipe org; and director with biggest objections left the company

What next in Bellevue?

- Need to improve metrics on opportunity to do
- Aren't collecting metrics on time to fix issues; how many issues become defects
- Also doing no defect tracking, so don't know how many defects slip through or how long it takes to fix them
- Get issues lists in paper, not put in database, so no root cause analysis yet

What next in Bellevue, con't

- Aren't tracking checklist ID so it isn't being recorded every time
- Not sure if can find resource to enter additional data – or get agreement with staff to enter it
- Would need a database for this data
- Lots of room for improvement!

31

1999 Results

- We made our goal of 98.5% correct bills
- Had four months of 100% correct bills – never, ever, had one before
- Hard to get people to do it in beginning; we were lucky Floyd was really behind it; now they see value and like it

32

What happened in 2000

- Joint venture with Bell Atlantic started in April
- BA doesn't do software process improvement, as far as we can tell
- Low support from new VP – hates word 'standards' and word 'process', hates Fagan inspections – wants very fast development and thinks 'process' slows development down
- Floyd still supports inspections

33

What now it is 2001?

- Prior SEPG group no longer exists
- New director in Bellevue 2/2001 – don't know if he supports inspections
- Inspections are pretty institutionalized here but may do them for form's sake
- Billing errors – original motivation – lots of small errors in 2000, few 100% correct months. But each month 99+% correct bills.

34

What now it is 2001?

- I'm the only support person left and I'm on a different job so little time to pay attention to inspections
- I still train new staff every few months
- New Release Manager for Billing group has inspections on her checklist for software releases
- Hurts that groups like DBA's, Data Warehouse, Production Services don't do them

35