

Lunch-N-Learn

1:00-1:45 PM

The future of system
administration: how to stop
worrying and love self-
managing systems



The future of system administration: how to stop worrying and love autonomic computing

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Threat or menace?

- Autonomic computing means “systems manage themselves”. So...
- No more system administrators ☹️
- No more profession ☹️
- “Would you like fries with that server?”
- What a crock!



Prognosis is good, but...

- Preparing for the past or present isn't enough.
- **Must prepare for the future, instead.**
- This includes particular kinds of **professional development.**



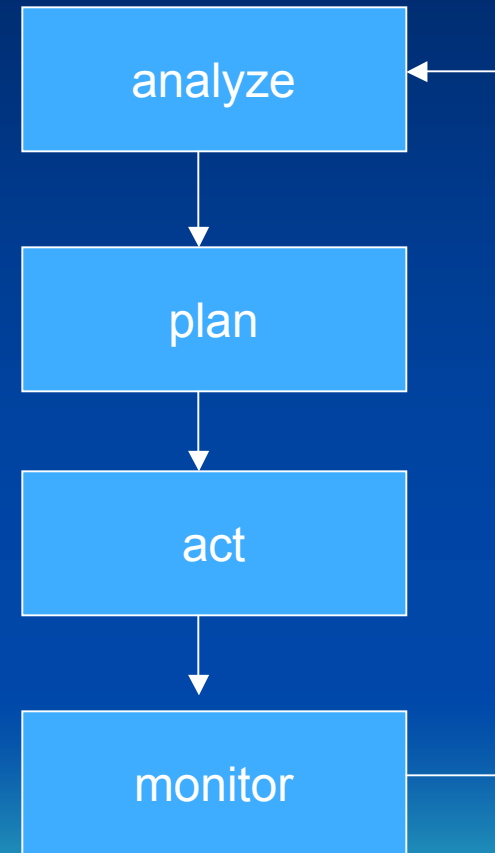
Purpose of this talk

- Reframe the problem and threat of autonomic computing to the profession of system administration.
- Discuss some lessons from history and experience.
- Develop a strategic plan that we can use to address the threat.
- Side-effects: respect, dignity, professional stature, increased pay: everything you've always wanted.



Many names, same idea

- “Autonomic” systems.
- “Self-*” systems
- “User-aware” systems.



If you're so smart,

- “why ain't you rich?”
- Writing an autonomic system is something like predicting the stock market!
- It needs a lot of help when unexpected things arise!



Before and after

Before autonomics	After autonomics
Manage configuration	Manage architecture
Twiddle bits on disk	Set policies
Troubleshoot configurations	Analyze system dynamics
Understand file formats	Understand performance factors



Do what I think, not what I say

- Dream of autonomics: managers will input business process, all goes well.
- Reality: we'll find out that what we say is not what we want.
- Role of new sysadmin: figure out what people **really** want and **make it happen**.
- We are the translators of the new age!



“Blue collar” or “white collar”?

- Without autonomies, we're plumbers.
- With autonomies, we're managers.
- Not all plumbers can become managers.
- But the ones that do get more respect!



Can you be replaced?

- Autonomic systems exhibit:
- narrow but substantial technical expertise.
- compulsion to protect themselves to the exclusion of other considerations.
- limited communications skills.
- no social skills.



Reframing the threat

- Myth: autonomic systems require **no management** and will eliminate the profession.
- Reality: they require a **different form** of management, and goodly bit of it.
- But you might have to become a **different kind** of system administrator in order to manage them.
- We are neither educating nor producing this new breed.



Darwin was wrong!

- It's not “survival of the fittest.”
- It is “survival of those who fit.”
- Keys to survival
 - develop a new niche.
 - exploit its strengths.
 - avoid its weaknesses.



Not with a bang, but a whimper

- There will be no sudden house-cleaning.
- Selection process is subtle.
- “Certain people” become less crucial.
- “Certain people” become more crucial.
- **Probabilities** change, not certainties.
- Lots of “old jobs” still around.
- Just slightly fewer, each year...



Pruning failures from the gene pool

- The old niche is full: nut-turners and techno-hermits are an endangered species.
- The new niche: intermediary between humans and complex systems.
- “Managers of human-computer communities”



Survival skills

- technical and non-technical communication: vocabulary, written, spoken.
- intrapersonal: collegiality, negotiation, conflict resolution.
- time management: balancing, prioritizing.
- analysis: scientific method, statistics, predictive techniques.



Survival attitudes

- self-valuation and professionalism.
- placing management goals above self-interest.
- ability to “close a box” and leave it closed.
- ability to leave “good enough” alone.



What color is your epitaph?

- “My job was just too difficult”?
- “I didn’t get no respect”?
- “1,203,492 asses saved”?



A hard lesson learned

- Good works aren't enough.
- Clean sweeps can eliminate everyone who owes you anything.
- Cannot base job security upon being essential now.
- Must be perceived as essential to the future!

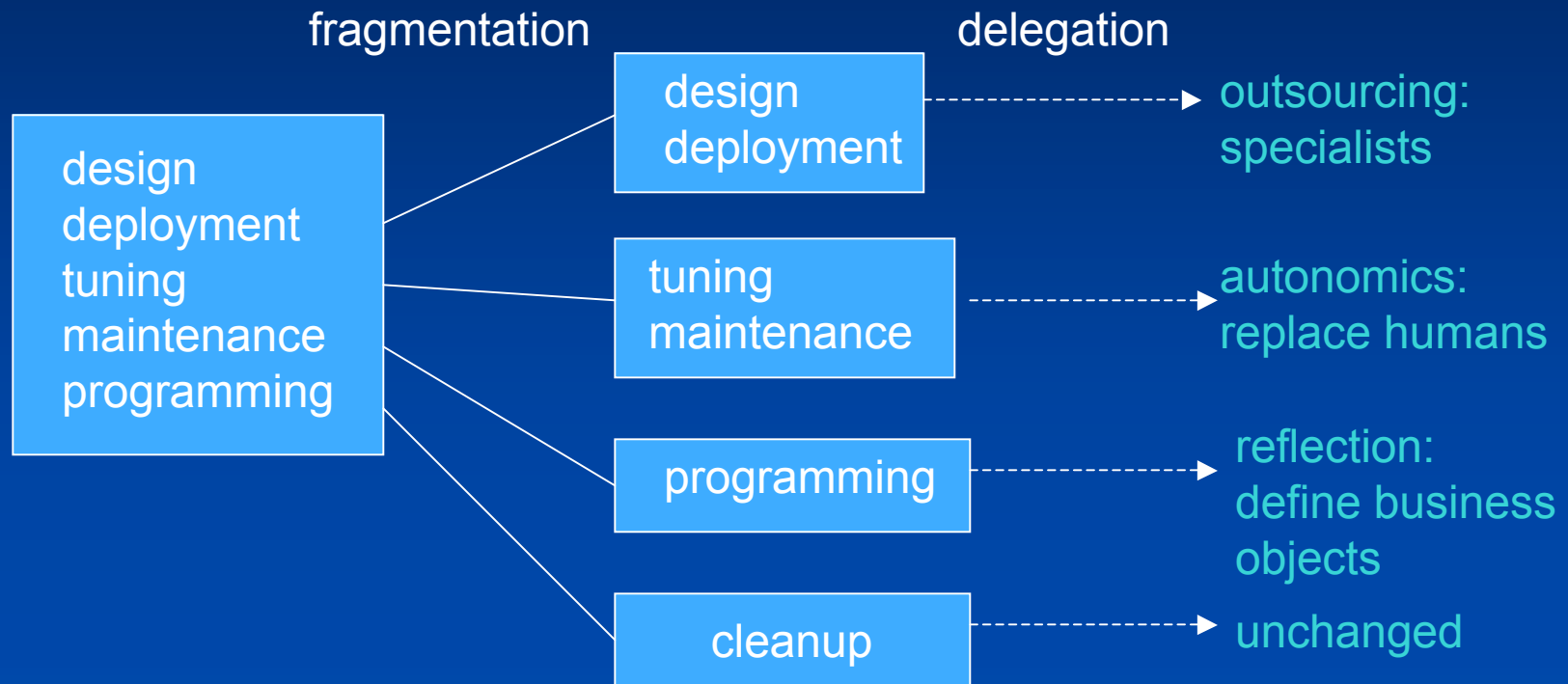


Lesson from a Chemistry T-shirt

- “If you’re not part of the solution, you’re part of the precipitate.”
- This isn’t a **problem**.
- You’re just **irrelevant**.



Lessons from Database Administration



the past:
do everything

the present:
specialization

the future:
humans define policies

time

Trends in DBA

- Specialists do **design**.
- Autonomics take over **grunt work**.
- Much of what autonomics do, humans were perhaps **not doing already**.
- But you can't outsource **refining business goals!**



Right now...

- Design of databases is already an outsourced thing.
- Autonomics can tune performance at 80% of the capabilities of a human administrator.
- Reflection modeling is replacing lots of database programming.
- The former kind of DBA is slowly becoming obsolete.
- But a new kind is becoming crucial...!



The new DBA...

- Understands and supports business process.
- Designs business objects that model that process.
- Optimizes object methods.
- Updates models as business processes change.
- **Serves as interface between management and infrastructure.**



Lessons learned from DBA

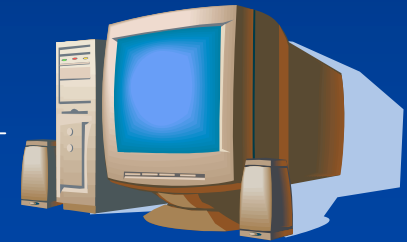
- When automation threatens:
- human problems remain (help desk is safe)
- systems become more complex (and require more mediation)
- people who remain move upwards in business hierarchy.
- perceptions of those people **improve.**



Old and New



old: mediate between
users and infrastructure



new: mediate between management
goals and infrastructure



System administrators and post-it notes

- If you want to be essential to a business, users aren't the primary vector.
- You have to get to management.
- Best way: make your job the easiest way to accomplish business objectives.
- Put post-it notes on desk of every Fortune-500 CEO in the country.



Analogy to system administration

- Best way to become more important: get on management's radar:
 - support business process.
 - become crucial in their eyes.
 - connect yourself to the future, not the past.



System administrators and asbestos abatement contractors

- EPA: This stuff is dangerous.
- State government: Don't do this yourself. Hire someone licensed by us, or you'll make a mess!
- Result: highly trained people who form a licensed "guild", with higher pay, better benefits, etc.



Autonomics as an abatement process

- This stuff is dangerous.
- One slip and the business loses lots of money.
- Driven by complex policies that untrained people can't understand.
- Don't try this at home.



Lesson learned from abatement contractors

- It all works better when:
 - the government sanctions professionalism.
 - there is licensing.
 - the culture takes a stand against doing it yourself without a license.



So, what's the prognosis?

- You *might* lose your job.
- You might, however, become more crucial than ever before.
- Key is how you as an administrator react to this threat.



Interfacing with management

- Stop distinguishing between “us” and “them”:
- Make your goals their goals.
- Learn to speak their language.
- Learn to justify your decisions in their terms.
- Make yourself partners rather than servants.



Psst...

- I don't want to be the one to tell you this, but, you're managers already.
- A lot of how people view us is how we view ourselves.
- If we view ourselves as downtrodden, abused people, they will too.
- It's time to change our perception of **ourselves.**



Case study: learning to speak with management

- “Broadband in dorms” stalled at an edu.
- Administration unresponsive to “what we can do” to solve the problem.
- Arguments about
 - how it’ll help students
 - how it’ll help faculty don’t work.



The cost of not doing things

- Key issue: “what is the cost of not solving the problem?” This includes:
 - faculty and student satisfaction.
 - applicant and alumni perceptions.



Lesson learned

- No power in the universe could interest the administration in spending money to fix the problem for the benefit of faculty or existing students.
- Everyone jumped when Admissions feared an impact upon new student applications.
- Key lever: what's important to the business?



Learning to listen

- Lots of us waste lots of time trying to explain our point of view to management.
 - This is a waste of time.
 - They aren't trained to understand your point of view.
- Most important skill of the next generation: learning to listen to management.
 - Not to obey, but to understand.
 - Not to argue based your *own* goals, but instead based upon *theirs*.



Learning to understand autonomies

- Autonomic systems don't function like non-autonomic ones.
- One crucial key: understand what it's doing.
- Must engage instead in a form of science:
 - Hands off.
 - Minds on.



Service Science

- A new way of conceptualizing management.
- Based upon invariant laws of services and service composition.
- Key methodology is scientific:
 - analyze, predict, plan, act, evaluate



Summary

- Autonomic systems don't require present-day system administrators.
- They require *a new kind*.
- We can either be eliminated, or we can benefit.
- The risks are great, the benefits are greater.



Conclusions

- Don't fear the future; be **part of it**.
- Don't build walls around management; **become it**.
- Don't resist change; **exploit it**.
- And we will evolve toward a better profession.

