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Agility, Quality, Innovation, Joy in Work



Excellence

Methodology Assists, Discipline Delivers

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Excellence

Making success *repeatable*

- Continuously advancing the boundaries of quality
- Customer feedback

☒ Exceeded Needs ☐ Met Needs ☐ Need to Improve for Quality
☒ Exceeded Needs ☐ Met Needs ☐ Need to Improve for Value
☒ Exceeded Needs ☐ Met Needs ☐ Need to Improve for Timeliness

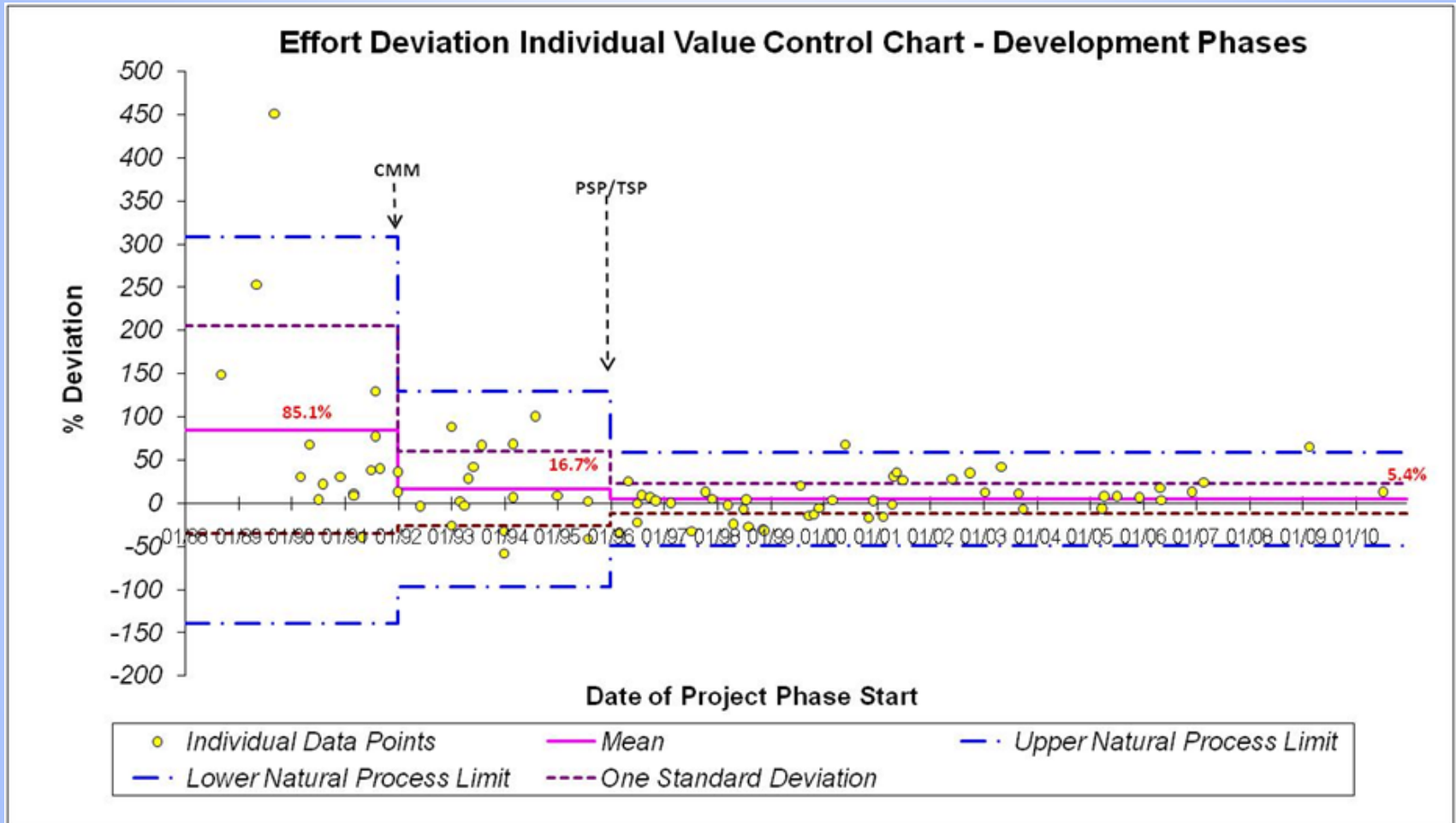
ais Advantage - 1

- Founded In 1986; over *25 years* of industry experience
- *Winner* of IEEE Software Process Achievement Award
- The *first* U.S. Small Business assessed at SEI *CMMI Maturity Level 5*

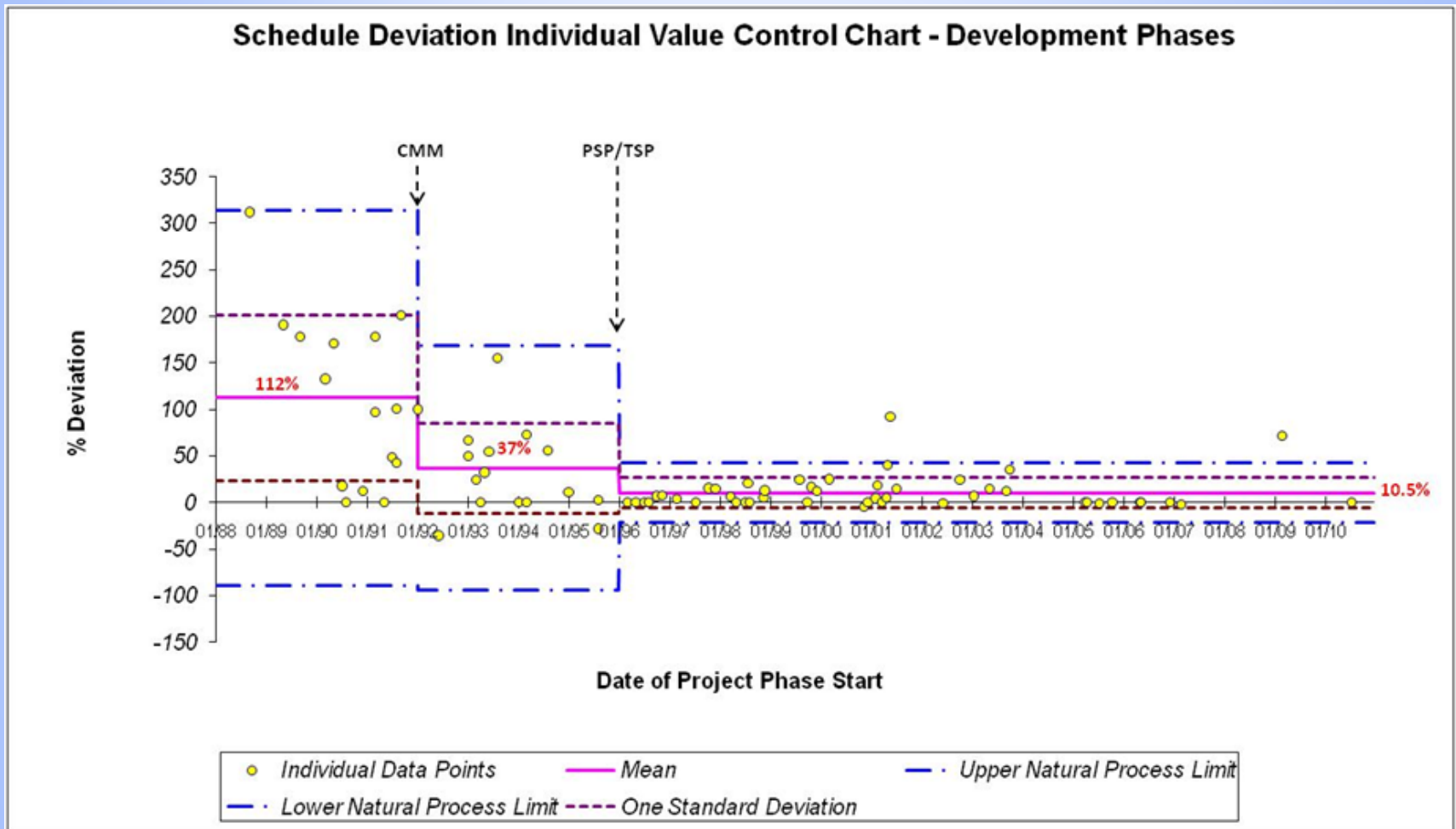
ais Advantage - 2

- *High velocity* maturity level 5 - organization (CMMI), team (TSP), individual (PSP)
- Bottom up driven - *over 330 customized and home grown* processes developed and continuously enhanced by engineers
- *Over 15 years history* of high quality and predictability
 - Effort deviation: 5.4% average
 - Schedule deviation: 10.5% average

ais Advantage - 3



ais Advantage - 4



Typical Project - 1

- Modernization
 - *Streamline* for improved efficiency
- Firm *fixed* deadline
 - Dependencies with other agencies and applications
 - Major cost impact on overrun
- Fixed bid, multi-year project
 - In *production* by end of year 2
 - Productivity enhancements in year 3
- *Multiple* customer points of contact

Typical Project - 2

- ~500K undocumented COBOL code
 - Not standardized – evolved over time
- ~800 million records to be migrated
 - With business logic
- ~70 non-standardized external interfaces
- System *performance* is key

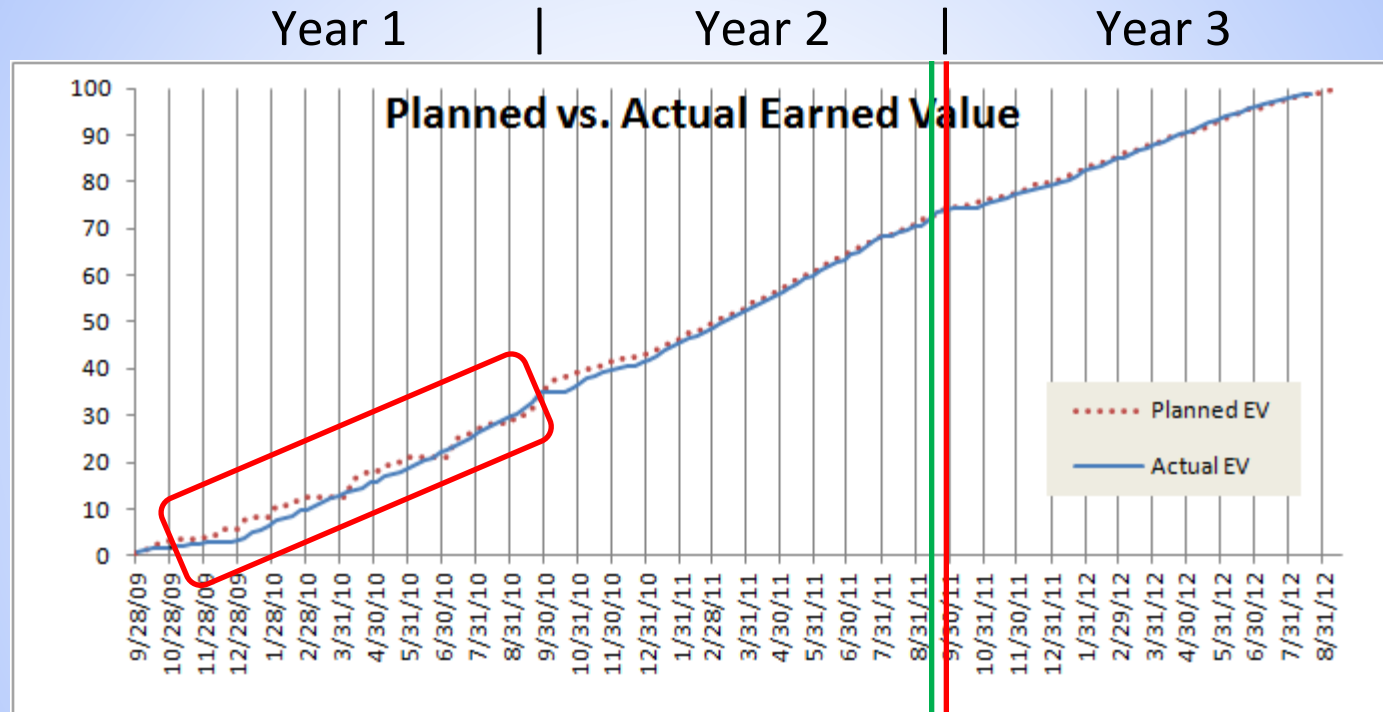
Typical Project Concerns

- *Largest project* undertaken by AIS
- *Organization's historic data* not available for some project work products
- *Largest distributed team* with 40% new employees
 - 17 person team
- Typical questions
 - Will team size impact quality and schedule?
 - How quickly will new team members be able to work at maturity level 5?
 - Are historic data and experiences valid?
 - *Will processes scale up?*

Project Status - 1

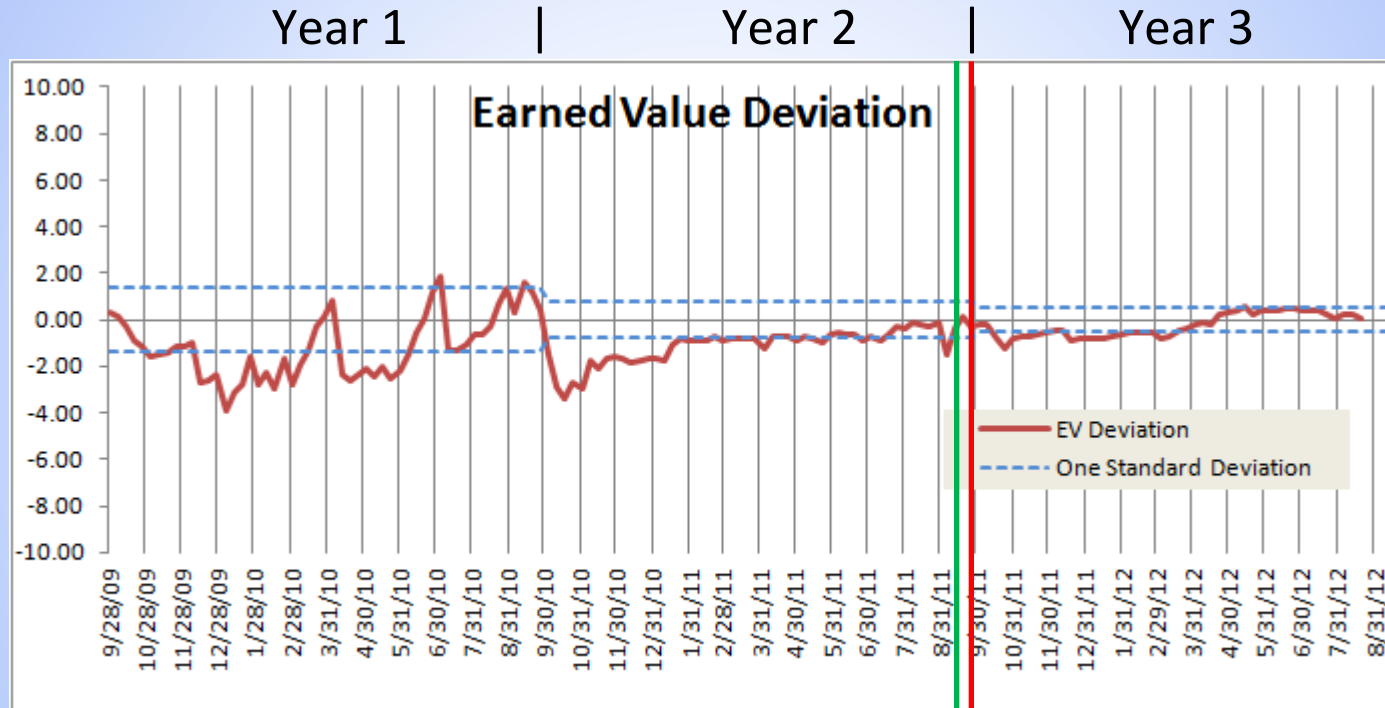
- System in production *1 week ahead* of schedule
- *No changes* in commitment to customer
- *High velocity* development with over 570 KLOC delivered into production in ~100 weeks
- Met federal mandates for *security*
- Product engineering effort was 82.7% of total project effort (17 person team)
- *0.097 defects/KLOC* in Production

Project Status - 2



In production ahead of schedule
Production target

Project Status - 3



In production ahead of schedule
Production target

Start The Project Right

- *Jelled* team at project initiation – formal team launch process
- All team members involved in making plans they can *fully commit* to, based on organization and individual historic data
- Teams take *ownership* of process, plan and quality
- Teams have *required* skills – technical, planning and quality management

Plan In Detail

- Use *historic data* where possible
 - Developer will *re-plan* each assigned component
 - Use *team data* when individual data is not available
- Plan the unknowns
 - Plan for proof of concept / research / *pilot component* tasks
- Keep plan current
 - Track against *current* plan, report against *baseline*
 - Detailed planning at start of each year
- *Tailored* processes
 - Revise processes based on project experience and need

Execute With Discipline

- Granular plan with weekly Earned Value tracking – team, individual
- Component postmortems and feedback – individual, team
- Quality above all

Detailed Project Status - Team

Data for week of	5-Apr-10	31	of 61				
				PROJECTED END DATE	Week Of	Week(s) Ahead	
	Baseline Plan	Actual	Actual/Plan	Rem EV Effort & Avg EV Eff/Wk	20-Dec-10	-16	
Project Hours			1.09	Avg EV Eff/Wk	15-Nov-10	-11	
Project Hours To-Date			0.81	Rem EV Effort and Estimating Accuracy			
Earned Value			1.47				
EV To-Date			0.71	To Date Hours Per EV (excl Blocked EV Eff)			
EV Effort				FOR ONTIME COMPLETION			
Blocked EV Effort				Avg EV / Week			
				Avg EV Effort / Week			
To-Date Hours for EV Tasks Closed			0.90	Total EV Effort Required			
To-Date Hours for Rework Tasks Closed			0.90				
Cost of Quality [(A+FR+PREV)/TOTAL EFFORT]					Actual	%	
Appraisal COQ (Closed Tasks Only)				Product Engineering		74.67%	
Failure COQ (Closed Tasks Only)				Non Product Engineering		25.33%	

➤ Key information

- What is the project's current *status*?
- What is the *projected* completion date?
- What is required for *on-time completion*?
- Is the team's actual effort *distribution* as planned?

Corrective Actions

- Processes streamlined to minimize non-product engineering effort
- Processes and task % distribution revised for standard components
- Processes redefined for new component types
- Each team member committed to expending additional effort over a *12 week period* instead of adding 1.5 additional resources

Weekly Plan - Individual

Individual Status Plan for <Resource> for the Week Of		13-Feb-12	TODAY: 15-Feb-12	
Total Planned Effort For Tasks Targeted To Close This Week	29.5	37.0	<- Expected Effort for Week	
Total Planned Effort For Tasks Targeted To Close Thru This Week	38.2	9.8	<- Planned Effort for Tasks Closed	
Code - Task Name (Include Product Engineering Tasks only)	PI Effort	Status	INITIAL Target Date	Dependencies / Revised Date
MT ABC				
CmtABC - Postmortem	0.6	Complete	14-Feb-12	2/16/2012
DUI XYZ				
DuiXYZ - Walkthrough and rework draft screen layouts	4.4	Complete	10-Feb-12	R1, 2/15/2012
DuiXYZ - Prepare for Screen Design JAD	1.8	Complete	15-Feb-12	R1, R2
DuiXYZ - Execute Screen Design JAD	3.0	Complete	16-Feb-12	
DuiXYZ - Debrief from Screen Design JAD	0.7	In Progress	16-Feb-12	
DuiXYZ - Develop Screen Layouts	7.3	In Progress	17-Feb-12	
DuiXYZ - Personal Review Screen Layouts	2.1	To Be Started	17-Feb-12	
SCR Defect				
SCR 123	0.0	Complete	14-Feb-12	R3
Update A12 Use cases				
Create/Update Use cases	4.3	In Progress	23-Feb-12	R4

➤ Key information

- What *tasks* do I need to work on?
- *When* should I close each task?
- What are the *dependencies*?
- Am I making *sufficient* progress for the week?

Component Postmortem

- Data analysis at completion of each component
 - Questionnaire with *5 basic analysis* questions regarding size, productivity, quality and schedule
 - If pilot component, actual productivity data is used for future components
 - Updated personal review checklist
 - Updated inspection checklist
 - Revised development process steps

Quality Above All

- Staff trained in quality methods
- Structured personal reviews and team inspections of all work products
 - Individual checklist for reviews, revised based on current defects and data analysis
 - Statistical process control analysis to assist in identifying components for re-inspection
- Predicting component quality using PQI
 - Revised based on analysis of over 150 components
 - Database components: > 0.365
 - Middle-Tier components: > 0.369
 - User Interface components: > 0.249
- Highest quality into test
 - 76.4% of components with *0 post unit test* defects

Most Valuable Asset

- Team morale
 - Team members have *positive experience* on the project
 - Effective *communication* within the team

- Employee confidence and growth
 - Matched with *strengths*
 - Opportunity to *expand skills*
 - One-on-one *coaching*
 - *Mentoring* by peer

Customer Communication

- Periodic documented status updates
- Frequent issue resolutions, technical interchanges and product demonstrations
 - Discuss and *defend* technical decisions and suggestions
 - Maintain *decision log*
- Provide intermediate and frequent deliveries for acceptance
- *No surprises and achieve buy-in*

Project Summary

- *~680 total KLOC* developed over 3 years
- Met required *federal standards*
- *Zero system downtime* due to functionality
- *0.097 defects/KLOC* in Production
- Final product in production *1 month ahead* of schedule
- End user *productivity increased* by ~300%
- *Saved* the customer ~2 million in support costs
- *Exceeded* customer needs for Quality, Value and Timeliness

Summary

- CMMI, TSP & PSP form the *backbone of AIS' success*
- Training, mentoring, and one-on-one coaching expedite a new resource's *capability to work at high maturity*
- *Processes customized by developers* form the backbone of project development
- Individual's and team's *dedication and discipline in following the processes* deliver the results

Success
is understanding and adapting
from experiences.

Excellence
is making
success repeatable.

Dedicating the
success of this project
to
Watts Humphrey

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