An Industry Perspective on What We Should be Teaching our Next Generation of Software Practitioners in the Universities

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Traditional Software Engineering Education

Versus

Real World
Transition: University to Industry

This is the way we work here
Transition: University to Industry (cont.)

This is the way we work here

Agile?
Agile at Scale?
Waterfall?
Transition: University to Industry (cont.)

This is the way we work here

Learn Expected Way of Working
Improve Expected Way of Working
First practical thing we should be teaching is how to improve an existing method. Example: Retrospective Practice.

Focus
- How we can teach future software practitioners to improve any existing method using Essence.
A little background on Essence

• Object Management Group (OMG) standard in 2014. Current version 1.2, Released 2018
• A kernel and language for software engineering methods
• NOT a method, but a common ground of essentials underlying all methods
Essence

• 7 Alphas
• Each Alpha has 5 or 6 states
• Each state characterized by a list of checklist items

Examples:
  Requirements
  Stakeholders

Multiple examples of their use
My own background

Sharing stories
My own background

Sharing stories

Stories from real world experiences
Guidelines used in transforming real life stories into Essence checklists

• Natural language
• Not “check-the-box” checklists
  – Intentionally worded to elicit conversation
  – Teams decide on interpretation given context
• Focus on achieving the goal

Can help with effective use

Example shortly
Where we are headed

• A number of concrete examples ...

• Teaching future software developers how to conduct a root cause analysis of a problem to aid in arriving at an optimum solution
Examples common industry challenges

• “We are always dealing with unclear requirements”
• “We can’t get our stakeholders to work with us”
• “The hardware is always late and management ends up cutting the software test time”

But before we dig into these...
Essence Education Forum

University

Requirements → Develop software

Industry

Real stakeholders?

Ambiguous requirements?

Gap
Actual case study example: **Using Essence in “stealth mode”** to solve a problem

1. Let me explain the problem we have. Our 2 key customers use our system differently.

2. Stakeholders

3. Often when we get focused on changes for one, we break critical functionality for the other.

4. System functionality tested? Defect levels acceptable?

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Actual case study example: Using Essence in “stealth model” to solve a problem

1. Let me explain the problem we have. Our 2 key customers use our system differently

2. Stakeholders

3. Often when we get focused on changes for one, we break critical functionality for the other

4. System functionality tested? Defect levels acceptable?

It’s just a conversation using natural words that can help guide teams to find their own effective solutions.

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Client Services

Use Essence when teach Scrum

Everyone’s agile is different

Focus on the goal
Use Essence when teach Scrum

Jeff Sutherland, co-founder of Scrum
1/3rd Scrum practices implemented well
1/3rd poorly
1/3rd not at all
Getting back to client with 2 key customers who use product differently
Getting back to client with 2 key customers who use product differently

Real Goal –
Get stakeholder feedback
Stakeholder

Involved

- Representatives assist the team
- Timely feedback and decisions provided
- Changes promptly communicated

Helps teams focus on the goal

Note: Alpha State Cards (available for download from SEMAT Website)
In Agreement

- Minimal expectations agreed
- Rep’s happy with their involvement
- Rep’s input valued
- Team’s input valued
- Priorities clear & perspectives balanced

Often misunderstood

- Words carefully chosen from real world situations

Students can be taught situations so don’t get big surprise in industry
Essence sounds like a new method and its inconsistent with agile.
Essence sounds like a new method and its inconsistent with agile.

Must be interpreted within the context of your agreed to practices.

How to use checklists needs to be taught to students. Best done through concrete examples.
Conflicting requirements identified and attended to

Not telling you “how to” do this
When new developers leave University

Taught “Backlog Grooming” Practice

Organization 1: Way of Working X

Big surprise!

Organization 2: Way of Working Y

Big surprise!
Back to the Essence Workshop...

Requirements are not always requirements!
Back to the Essence Workshop...

Requirements are not always requirements!

Requirements

- Enough addressed to be acceptable
- Requirements and system match
- Value realized clear
- System worth making operational

Students should be taught this because it is the way the real world of industry operates
**Stakeholders**

- Recognized
- Represented
- Involved
- In Agreement
- Satisfied for Deployment
- Satisfied in Use

**The people, groups, or organizations who affect or are affected by a software system.**

**The stakeholders:**
- Provide the opportunity and are the source of the requirements
- Use and consume the software system
- Fund the development of the software system
- Actively represent the groups and organizations affected by the software system
- Are actively involved all the way through the endeavor
- Have representatives that collaborate with the team to reach agreement on an acceptable system

**Note:** Alpha Definition Cards (available for download from SEMAT Website)
Stakeholders need to have a stake

Who do I need to talk to in order to get the data we need?
Stakeholders need to have a stake

Who do I need to talk to in order to get the data we need?

Students can understand these kind of real stories

Stakeholder
- Recognized
  - Stakeholder groups identified
  - Key stakeholder groups represented
  - Responsibilities defined

Stakeholder
- Represented
  - Responsibilities agreed
  - Representatives authorized
  - Collaboration approach agreed
  - Way of working supported & respected

Stakeholder
- Involved
  - Representatives assist the team
  - Timely feedback and decisions provided
  - Changes promptly communicated
Stakeholders need to have a stake

Next time why don’t you write a penalty clause into the contract?

Students can be better prepared to help their organization on day 1 when they start their first job in industry
Teaching students to effectively apply checklists to aid critical thinking

150
Checklist
Items

Not Essence checklists
Expect teams to add own
Teaching students to effectively apply checklists to aid critical thinking

We are going to give them a passing grade because they got 140 out of 150.

All checklists don’t carry the same weight!

Need to teach next generation how to be good critical thinkers

Not Essence checklists
Expect teams to add own
We are trying to create a culture of listening... If our tone is dialogue based, people will self-include and exclude... Today more and more people are growing up in dialogue rather than edict.
We are trying to create a culture of listening... If our tone is dialogue based people will self-include and exclude... Today more and more people are growing up in dialogue rather than edict.
Principles, Values and Cybersecurity

Safety ?
Security ?
Privacy ?
Way of Working

Principles Established

- Team actively support principles
- Stakeholders agree with principles
- Tool needs agreed
- Approach recommended
- Operational context understood
- Practice & tool constraints known
Way of Working

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Essence doesn’t tell teams what their principles or values need to be, but...
Risk and critical thinking
Critical thinking and Cybersecurity

Our conventional programs seek 99% solutions that take years, whereas the wars we are in today require 75% solutions in months.
Critical thinking and Cybersecurity (cont.)

But how do we decide which 25% to cut?

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Our conventional programs seek 99% solutions that take years, whereas the wars we are in today require 75% solutions in months.

But how do we decide which 25% to cut?

Risk to safety, security or privacy?

Need for critical thinking and balancing trade-offs
Another essential skill to teach next generation: Estimating

When will you be done?
Work

Prepared

- Commitment made
- Cost and effort estimated
- Resource availability understood
- Risk exposure understood
- Acceptance criteria established
- Sufficiently broken down to start
- Tasks identified and prioritized
- Credible plan in place
- At least one team member ready
- Integration points defined

SEMAT 2 / 6
Work

Under Control

- Tasks being completed
- Unplanned work under control
- Risks under control
- Estimates revised to reflect performance
- Progress measured
- Re-work under control
- Commitments consistently met
Work

Under Control

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Team

Seeded

- Mission defined
- Constraints known and defined
- Growth mechanisms in place
- Composition defined
- Responsibilities outlined
- Required commitment level clear
- Required competencies identified
- Size determined
- Governance rules defined
- Leadership model selected
The power of Essence checklists isn’t so much the checklists themselves, but the opportunity they bring to share experiences and stories from the volunteers who developed them...
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Another way to say this is:
We are sharing past experiences to help new University graduates raise their competency level faster so they can start contributing on day 1 when they leave the University and enter Industry.
Conclusion

If you are interested in more info on this subject refer to www.essence-in-use.com for references to related blogs, books and training course

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References

• [5] Alistair Cockburn Interview https://www.youtube.com/watch?v=xDlz6mEm-7I,