AGILE AND LEAN Program Management
Scaling Collaboration Across the Organization

AUTHOR OF "PREDICTING THE UNPREDICTABLE"

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capital letters or in all capitals.

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For my family. Thank you for your support.
Contents

Praise Quotes .................................................. i
Acknowledgments ............................................... iv
Foreword ......................................................... v
Introduction ...................................................... vii

1. Defining Agile and Lean Program Management ...... 1
   1.1 Review the Twelve Principles of Agile Software Development ................................................. 3
   1.2 Review the Seven Lean Principles ......................... 4
   1.3 Agile and Lean Together Create Adaptive Programs ................................................................. 4
   1.4 A Program Is a Strategic Collection of Several Projects ............................................................. 5
   1.5 Program Management Facilitates the Program to Release ............................................................ 6
   1.6 Program Management Coordinates the Business Value ................................................................. 6
   1.7 Agile Program Management Scales Collaboration ................................................................. 7
   1.8 Agile and Lean Effect Change at the Program Level ................................................................. 9
   1.9 What Program Managers Do ................................. 9
   1.10 Take a Product Perspective ................................. 10
   1.11 Principles of Agile and Lean Program Management ................................................................. 11

2. Consider Your Program Context ............................. 12
CONTENTS

2.1 Cynefin Helps with Decisions ............................. 12
2.2 Understand Your Product’s Complexity ............... 16
2.3 Know Which Program Teams You Need .............. 18
2.4 The Core Team Provides Business Leadership and Value .................................................. 23
2.5 Do You Need a Core Team? ............................. 24
2.6 Principles of Consider Your Program Context .... 25

3. Organize Your Program Teams ............................. 26
3.1 Create Your Core Team .................................. 26
3.2 Beware of Forgetting Core Team Members .......... 28
3.3 The Product Owner Role Is Key to the Program’s Success .................................................. 29
3.4 Organize the Software Program Team ............... 31
3.5 Don’t Manage More than One Program Team Yourself .................................................. 33
3.6 Principles of Organizing Your Program Teams .... 34

4. Start Your Program Right ..................................... 35
4.1 A Program Charter Sets the Strategy ................. 35
4.2 Develop the Program Charter with the Core Team 36
4.3 We Can’t Afford the Travel ............................. 37
4.4 Lead the Program Chartering Effort .................. 38
4.5 Create Your Own Program Charter Template ...... 39
4.6 Iterate on the Program Charter and Plans .......... 45
4.7 Create the Agile Roadmap .............................. 46
4.8 Create the Big Picture Roadmap ..................... 48
4.9 Principles of Start Your Program Right ............ 50

5. Use Continuous Planning .................................... 52
5.1 Differentiate Between Internal and External Re- leases .................................................. 52
5.2 What Do You Want to Release This Month? .......... 53
5.3 Create Minimum Releasables ......................... 54
5.4 Plan for External Releases .............................. 56
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5</td>
<td>Deliverable and Rolling Wave Planning Helps</td>
<td>57</td>
</tr>
<tr>
<td>5.6</td>
<td>Small is Beautiful for Programs</td>
<td>58</td>
</tr>
<tr>
<td>5.7</td>
<td>How Often Can You Replan?</td>
<td>59</td>
</tr>
<tr>
<td>5.8</td>
<td>Separate the Product Roadmap from the Project Portfolio</td>
<td>61</td>
</tr>
<tr>
<td>5.9</td>
<td>Ways to Rank Items in the Roadmap or Backlogs</td>
<td>62</td>
</tr>
<tr>
<td>5.10</td>
<td>Decide How You Will Evaluate Value</td>
<td>67</td>
</tr>
<tr>
<td>5.11</td>
<td>Update the Roadmaps Often</td>
<td>68</td>
</tr>
<tr>
<td>5.12</td>
<td>Principles of Continuous Planning</td>
<td>68</td>
</tr>
<tr>
<td>6.</td>
<td>Create an Environment of Delivery</td>
<td>70</td>
</tr>
<tr>
<td>6.1</td>
<td>Visualize Program Team Work</td>
<td>70</td>
</tr>
<tr>
<td>6.2</td>
<td>Keep the Program Team Work Small</td>
<td>72</td>
</tr>
<tr>
<td>6.3</td>
<td>How Features Flow Through Teams</td>
<td>73</td>
</tr>
<tr>
<td>6.4</td>
<td>How Often Can You Release Your Product?</td>
<td>74</td>
</tr>
<tr>
<td>6.5</td>
<td>Release Internally, Even with Hardware</td>
<td>75</td>
</tr>
<tr>
<td>6.6</td>
<td>Are You Integrating Chunks or Products From Others?</td>
<td>77</td>
</tr>
<tr>
<td>6.7</td>
<td>Manage the Risks of Integration from Other Vendors</td>
<td>78</td>
</tr>
<tr>
<td>6.8</td>
<td>Create a Culture of Delivery Throughout the Program</td>
<td>80</td>
</tr>
<tr>
<td>6.9</td>
<td>Principles of Create an Environment of Delivery</td>
<td>80</td>
</tr>
<tr>
<td>7.</td>
<td>Encourage Autonomy, Collaboration, and Exploration</td>
<td>81</td>
</tr>
<tr>
<td>7.1</td>
<td>Software is Learning, Not Construction</td>
<td>81</td>
</tr>
<tr>
<td>7.2</td>
<td>Scaling Agile Means Scaling Collaborative Practices</td>
<td>82</td>
</tr>
<tr>
<td>7.3</td>
<td>Create Autonomous Feature Teams</td>
<td>84</td>
</tr>
<tr>
<td>7.4</td>
<td>Create Small-World Networks to Optimize Learning</td>
<td>85</td>
</tr>
<tr>
<td>7.5</td>
<td>Communities of Practice Create Connection and Collaboration</td>
<td>87</td>
</tr>
<tr>
<td>7.6</td>
<td>Avoid Hierarchical Titles</td>
<td>88</td>
</tr>
<tr>
<td>7.7</td>
<td>Continuous Integration and Testing Supports Collaboration</td>
<td>90</td>
</tr>
<tr>
<td>7.8</td>
<td>Beware of Technical Debt</td>
<td>92</td>
</tr>
<tr>
<td>7.9</td>
<td>Invite People to Experiment</td>
<td>93</td>
</tr>
</tbody>
</table>
CONTENTS

7.10 Principles of Encourage Autonomy, Collaboration, and Exploration ............................ 93

8. Conduct Useful Meetings for Your Program ................................................................. 95
  8.1 Explaining Status: Do Not Use Standups at the Program Level ................................. 96
  8.2 Define a Rhythm for Your Program Team ............................................................... 97
  8.3 Organize Your Program Team Meetings ................................................................. 101
  8.4 Program Team Meetings Solve Problems .................................................................. 103
  8.5 Retrospect at the Program Team Level ........................................................ .......... 106
  8.6 Principles for Conduct Useful Meetings for Your Program ...................................... 107

9. Estimating Program Schedule or Cost ....................................................................... 108
  9.1 Does Your Organization Want Resilience or Prediction? ............................................ 109
  9.2 Ask These Questions Before Estimating ................................................................. 110
  9.3 Targets Beat Estimates ......................................................................................... 111
  9.4 Generate an Estimate with a Percentage Confidence .............................................. 111
  9.5 Present Your Estimate as a Prediction ..................................................................... 115
  9.6 Spiral in on an Estimate ......................................................................................... 116
  9.7 Supply a Three-Date Estimate .............................................................................. 117
  9.8 Do You Really Need an Estimate? ........................................................................... 118
  9.9 Beware of These Program Estimation Traps ............................................................. 118
  9.10 Estimation Do’s and Don’ts for Program Managers ................................................. 120
  9.11 Principles of Estimating Schedule or Cost ............................................................. 122

10. Useful Measurements in an Agile and Lean Program ................................................ 123
  10.1 What Measurements Will Mean Something to Your Program? ............................. 124
  10.2 Never Use Team-Based Measurements for a Program ........................................... 124
  10.3 Measure by Features, Not by Teams ...................................................................... 126
  10.4 Measure Completed Features .............................................................................. 128
  10.5 Measure the Product Backlog Burnup ..................................................................... 129
  10.6 Measure the Time to Your Releasable Deliverable ................................................. 132
## 10. Measure Release Frequency
- Measure Release Frequency
- Measure Build Time
- Other Potential Measurements
- Measure Performance or Reliability Release Criteria
- How to Answer the “When Will You Be Done/How Much Will Your Program Cost” Question
- Principles

## 11. Develop Your Servant Leadership
- Program Managers No Longer “Drive” the Program
- Consider Your Servant Leadership
- How Servant Leaders Work
- Some People Don’t Want Servant Leadership
- Welcome Bad News
- Use the Growth Mindset
- Ask For the Results You Want
- Principles of Develop Your Servant Leadership

## 12. Shepherd the Agile Architecture
- Architects Write Code
- Many Developers Become Architects
- Encourage Iterative and Incremental Architecture
- Architects Can Help Expose Risks
- What the Program Architect Accomplishes Daily
- Architecture is a Social Activity
- Problems You May Encounter With Architecture
- Break the Architecture with Purpose
- Principles of Shepherd the Agile Architecture

## 13. Solve Program Problems
- Ask For the Problems or Impediments First
- People on the Core Team Don’t Deliver What They Promise
- Your Product Owners Have Feature-itis
- People on Teams Are Multitasking
| Chapter 13 | How to Start a Program With More People Than You Need | 171 |
| Chapter 13 | Principles of Solve Program Problems | 173 |

### Chapter 14: Integrating Hardware Into Your Program | 175 |
| 14.1 | Hardware Risks Are Different Than Software Risks | 175 |
| 14.2 | Understand Cost and Value for Hardware | 176 |
| 14.3 | Understand Each Part’s Value | 178 |
| 14.4 | See the Work | 180 |
| 14.5 | Design Incrementally and Iteratively | 183 |
| 14.6 | Use Continuous Design Review | 183 |
| 14.7 | Integrate Hardware Often | 184 |
| 14.8 | Manage Hardware Risks | 185 |
| 14.9 | Develop the Software Before the Hardware Is Available | 186 |
| 14.10 | Principles of Integrating Hardware Into Your Program | 189 |

### Chapter 15: Troubleshooting Agile Team Issues | 190 |
| 15.1 | The Teams Are Not Feature Teams | 190 |
| 15.2 | Teams Think They Are Agile, But They Are Not | 194 |
| 15.3 | The Teams Have Dependencies on Other Teams | 200 |
| 15.4 | Your Features Span Several Iterations | 203 |
| 15.5 | You Don’t Have Frequent-Enough Deliverables | 203 |
| 15.6 | Teams Don’t Finish When They Say They Are Done | 204 |
| 15.7 | Principles of Troubleshooting Agile Team Issues | 206 |

### Chapter 16: Integrating Agile and Not-Agile Teams in Your Program | 207 |
| 16.1 | Waterfall Teams Are Part of Your Program | 208 |
| 16.2 | You Have Teams that Produce Incrementally, But Not in an Agile Way | 210 |
| 16.3 | You Have Teams that Prototype and Don’t Complete Features | 210 |
CONTENTS

16.4 Principles of Integrating Agile and Not-Agile Teams in Your Program .................................. 211

17. What to Do If Agile and Lean Are Not Right for You .................................................. 212
   17.1 Try an Incremental Life Cycle ...................................................... 213
   17.2 Organize by Feature Team ......................................................... 216
   17.3 Learn to Release Interim Deliverables ......................................... 217
   17.4 Learn How to Reduce Batch Size With a Large Program ......................... 217
   17.5 Try Release Trains ................................................................. 218
   17.6 Principles for What to Do if Agile and Lean Are Not Right for You ................. 221

Annotated Bibliography .................................................. 223

Glossary ................................................................. 228

More from Johanna .................................................... 231
12. Shepherd the Agile Architecture

One of the big problems in agile and lean program management is how to manage the product’s architecture. If you don’t shepherd the architecture, you end up with a mess. If you create frameworks before you have features, you will be wrong. You might have significant rework (not refactoring) late in the program. Architecture throughout the program is the way we manage that risk. You might need to Encourage Iterative and Incremental Architecture, Architects Can Help Expose Risks, and decide When Should You Consider Architectural Stories.

The risks of deciding on the frameworks up front are considerable in a program. On the other hand, no architectural guidance might be a disaster on your program. Consider how your program can create an iterative and incremental approach to architecture. Also consider when is the most responsible moment to decide on the product’s architecture and the frameworks.

Back in How Often Can You Release Your Product?, you saw the potential for release frequency, based on the kind of product you have. Now, consider when to make architectural decisions.
Release Frequency and the Cost of Architectural Decisions

The closer your product is to SaaS, the longer you can wait to make many architectural decisions. You might have to make product-guidance architectural decisions, but you often don’t have to make many large up-front design decisions. The closer your product is to the right side of the continuum, with hardware, the more you might have to use set-based design approaches, or provide more architectural guidance earlier.

The program architect should not decide alone. The program architect works with feature teams and other architects across the program to collaborate and decide when to select which frameworks.

That makes your program architect’s job one of shepherding the business value of the architecture, which is a social and collaborative role requiring communications. The program architect helps facilitate the autonomy, collaboration, and exploration for the feature teams.

12.1 Architects Write Code

If we start with the premise that all architects on our program write code, we start well.

In software programs, we are accustomed to having enterprise, solution, or application architects. Often, those people do not sit
with the project teams. Instead, they proclaim the architecture from afar, early in the program.

That doesn’t work in agile or lean programs. It doesn’t work in other programs either, but we can discuss that later, over a beverage of your choice.

In an agile or lean program, the architect is responsible for the business value of the architecture, not for telling people what to do. The program architect does this in many ways:

- Balances the short-term goals with the overall system integrity, risk, expediency, technical debt, anything else that you would trade off short term goals against.
- Sustains development against technical debt. For test systems, this is the age-old problem of testing versus automating the tests and how you automate the tests. I’m a huge fan of automate enough and refactor your way into what you need, because you may not know what you need until you see how the system under development evolves.
- Writes acceptance criteria for system qualities and quality scenarios for the product.
- Leads the definition of how a complex system is structured, organized, and implemented. Landing zones can help guide this effort.
- Works with a feature team in a hands-on way. No seagull architects. No PowerPoint architects, (See Practices of an Agile Developer for an excellent description of this, SH06). No prophets. No police. Agile architects develop code and develop tests.
- Works with users (or with the program product owner on behalf of the users) to understand what the users do, how the users work, what the users understand and don’t understand about the system. What is the product vision? (See Develop the Program Vision for more information.)
Architects work with the entire project team, not alone. Architects work on all parts of the product, not just the challenging or interesting parts. In fact, if there are rote parts or boring parts, maybe that’s where the architect is needed most to automate something so humans don’t have to do it.

In my workshops and in my executive briefings, I tell managers they should put their most talented people, aka architects, on the things that are agile or lean impediments. For complex programs, those are most often the build system and test automation. I suggest they use the architects for several iterations to make significant progress on those problems, and get to some version of done.

You may have different roles for your architect, especially if you are integrating Commercial Off the Shelf (COTS) software or vendor-supplied products:

- Act as editor-in-chief for architecture decisions on the team.
- Guide the individual feature team architects who do the actual work.
- Help establish new products that are based on the architecture. This means understanding re-use, and establishing a vision for how the architecture slowly evolves as new products come and go. Can we harvest frameworks and products from what we have now?
- Help the business people understand and take advantage of the architecture for new system features, third-party integrations, and new product lines. The architect might use the product vision to discuss the relative value of features with product owners and the value of frameworks with feature teams.

You can see that people who have architecture responsibility shepherd the business value of the architecture. This is not the traditional “I’ll tell you how to build it because I know everything” position that way too many architects take.
12.2 Many Developers Become Architects

If architects write code, and if everyone owns the code, and we get to the final product by refactoring—which is how agile works—some substantial number of developers will work as architects at any given time. If your teams also pair or swarm over the code, no one will be able to tell who is the architect and who is not. That works quite well.

You still may need a program architect who can discuss risks with the business people, especially on the core team.

A program architect acts as a risk manager. She is experienced and able to talk with business and management with ease. She shepherds the business value of the architecture.

In Avoid Hierarchical Titles, I suggested you don’t call a program architect a “chief” architect. You want the architect to identify with the program, not with the organization’s hierarchy. When you use words such as chief, master, or über, you create or reinforce a hierarchy.

Architects may need to coach other developers, especially in how to create iterative and incremental designs—if they know how.

12.3 Encourage Iterative and Incremental Architecture

Many developers and architects see the big picture of the architecture, before they write any code. They know where they want to go and they want to implement the entire feature, now. That’s not helpful in an agile and lean program.
Instead, request that the architects collaborate on evolving the picture of the architecture over time. If they see that they have “curlicue” features, request that the architects collaborate with the teams to simplify the teams and the features.

Sometimes, this might mean that the teams realize they don’t have a cross-functional team that can deliver value. When the teams realize this, they will agitate for change. Program managers and program architects are technical leaders who can help the teams reorganize themselves, if necessary. See The Teams Have Dependencies on Other Teams for an explanation of straight and curlicue features.

I have yet to see an architecture last from initial design through the end of a program unchanged. Maybe you have.

The risks of totally designing an architecture are too high for an agile and lean program. Help the architects learn how to create features iteratively and incrementally.

Here’s one way to think about iterative and incremental architecture and design. Assume you have a product with a three-tier architecture. People have a picture of the architecture and while security pervades the product, the base security component is in the Platform layer.

As everyone creates features, it appears that the base security component is violating the Principle of Least Surprise and the Single Responsibility Principle. (The Principle of Least Surprise says that the product should act as the users expect it to. The Single Responsibility Principle says that one component should do one, and only one thing. Otherwise, you have coupling.)

This is a great time to refactor the code. Refactoring the code might not be sufficient when security violates two principles. And, you might refactor and discover performance problems. It’s time for iterating on the architecture.

You have several options. Consider the options in Architects Can
Help Expose Risks and Break the Architecture with Purpose.

No one could tell at the beginning of the program that security— as you planned it—would be a problem. The more the teams create features and refactor to patterns, the less likely the product will have a brittle architecture. With features first, everyone can contribute to the architecture.

I recommend as part of the release criteria, the feature teams define any performance or reliability criteria for the product or a piece of the product.

12.4 Architects Can Help Expose Risks

Aside from iterative and incremental development, the program architect can help expose risks. Maybe it’s worth the time for an architectural spike to learn about some area of the product? Back in *Software is Learning, Not Construction*, I said that we can learn about risks early to manage them.

Some product features are quite difficult to refactor in. These include scalability, some performance issues, and reliability to name just three. Don’t proceed with just features when these quality attributes are critical to your product’s success.

One way to manage these risks is to verify your roadmap has a walking skeleton (also known as the tracer bullet) approach to developing features. When you show feature teams and product owners the walking skeleton, they will ask, “How fast is this part?” or “How will this part scale from 300 to 30,000 users?” You now understand their system qualities for performance or scalability. You can adjust the system qualities as you proceed.

What if you need to know about some parts of the architecture first, because they will drive other program tradeoffs? You might. For example, in a smartphone, you might need to know the screen size
because that will drive the common GUI decisions and the heat
dissipation risks.

There are several options for this kind of a potential product prob-
lem. The solution you select might depend on the kind of product
you have, based on your product’s complexity. See Understand Your
Product’s Complexity. Here are some options that might work for
you:

- Do a pre-program research project. Bring together enough
people or teams to prototype the architecture that those
people believe will support the product you need. Once you
have enough information, start the program.
- Develop an architectural roadmap integrated with the pro-
gram roadmap, so you create features and manage architec-
tural risks as you proceed.
- Integrate architecture spikes with feature development. Maybe
your program can still develop the operating system (the
platform), and can answer other questions as you proceed.

The larger the program, the more you want to see architectural
problems early. You can’t do that if you can’t show the product
working. What would it take for your program to show a walking
skeleton of working product? That is the question your product
owners and architects can answer.

**12.5 What the Program Architect
Accomplishes Daily**

Architects lead by doing. Sometimes they do the hard work to pay
down technical debt that’s been accumulating for years. Sometimes
they do the hard work of seeing how the features are evolving into
an eventual framework, or two or three. And, when you have 200
or 300 or 400 people on a program, all over the world, working in 2-week iterations, you may well need people who explore just ahead of feature teams, so that the feature teams are free to develop features.

There is a difference between agile on a small program of about three teams and agile on programs of more than 10 teams. Part of it is the communication paths. No matter how much you try to communicate, the larger program will have more communication issues, just because there are more people.

Coordinating the design and architecture among very large programs is a non-trivial task. It’s partly managerial and partly technical. It’s also social and communication work. See Architecture is a Social Activity.

Evolving the architecture is not a problem that a program can solve with hierarchy and maintain agility. And it is a difficult problem to solve. Communities of Practice can help.

Consider these options for an architect’s daily work:

1. Use an architectural kanban based on the agile roadmap. Decide what risks the architecture wants to address now and how.
2. Perform architectural spikes with a feature team. This helps a team learn how the architect thinks about problems and solutions. In addition, working with a team spreads the architecture knowledge so everyone can work better.
3. Lead (and don’t direct) an Architecture Community of Practice. What do you want people to know, to evolve the architecture in a coherent way? What architecture problems do you want to raise? What do other people want to raise and address?
4. Provide direct coaching to people who want it.