SELECTING BETWEEN AGILE, PLAN-DRIVEN, AND HYBRID SYSTEMS PROJECT OPTIONS

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TUTORIAL

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Abstract:
SA&D—encompassing requirements, design, and project approach—has always been complex and challenging. But at least there once was a single, standard approach: plan driven. Plan-driven (e.g., traditional SDLC or “waterfall”) prescribes detailed, up-front requirements and linear, one-activity-at-a-time project execution. That changed in the mid-1990s when, given unacceptably high project failure rates, agile emerged as a key alternative, radically different from plan driven. Agile (e.g., eXtreme Programming, Scrum) defers detailed requirements and executes activities iteratively. In reality, many projects integrate elements of plan-driven and agile into a hybrid model. This complicates SA&D, requiring knowing how to:

- Do everything in multiple ways
- Choose the optimal approach

This workshop cuts through the confusion with concepts, frameworks, and exercises helping you learn:

- Essence of plan-driven vs. agile vs. hybrid
  - Two key dimensions: Requirements analysis and software construction
  - Underlying project assumptions: Impacting the value of plan-driven vs. agile vs. hybrid
  - Systems development process framework: Illustrating a unified understanding of each approach

- How to choose the optimal approach
  - Key project characteristics: Using an extended “home grounds model” describing circumstances ideal for each approach
  - Radar chart tool: Analyzing each project in terms of functional requirements, non-functional requirements, and team characteristics, which point to the best approach

Keywords: systems development, SA&D, methodology, hybrid approach

I. INTRODUCTION

The intensity of discussions and decision processes regarding the way systems development work is organized is frequently very high. Often, however, the choices are made at the level of an entire organization or an organizational unit instead of a development project. In this tutorial, we will make the case for the importance of selecting the development approach at the project level and using a systematic, well-structured process for making the decision regarding this choice. We propose a process model for making the development approach decisions.
II. TUTORIAL PLAN

This tutorial is designed to provide the participants with an introduction to a) the key characteristics of the hybrid approach to systems development, and b) a technique that allows the conceptualization and structuring of complex SA&D projects through visual models that capture and portray the key characteristics of these projects. The tutorial guides the participants in learning how these visual models can be used for the identification of the optimal project approach for software development—agile, plan-driven, or hybrid. Further, these models provide guidance for determining and balancing the needs for functional requirements, non-functional requirements, and team characteristics.

The tutorial will alternate between presenting the models, facilitating a discussion regarding them, and allowing participants to apply mini-case studies that are addressed in small groups. The tutorial will also engage the participants in a discussion regarding the pedagogical implications of the proposed way of structuring and analyzing SA&D projects.

After the tutorial, participants will be better equipped both to employ these principles in industry and to teach them in SA&D and IT project management courses.

III. AUDIENCE/PARTICIPANTS

We expect the tutorial to serve best faculty members who as scholars and educators are interested in a systematic approach to systems analysis and design that recognizes the need to adapt a project’s methodology to the needs of the project and to choose an optimal approach based on project characteristics. Our hope is that the workshop will be particularly helpful for IS educators teaching courses in SA&D and seeking for an educational model that recognizes the significant role that hybrid approaches have in contemporary SA&D practice.

IV. PRESENTERS

Dr. Gary Spurrier has extensive experience in software development, including roles as a CIO, COO, product manager, software development project leader, and consultant. His research focuses on developing pragmatic and effective approaches to the development of enterprise software.

Dr. Heikki Topi has dedicated a significant part of his academic career to leading and participating in national and global efforts to develop resources for IS and general computing education (such as IS 2010, MSIS 2016, and CC 2020), mostly through AIS and ACM. He is also a co-author of a leading data management textbook, and a new textbook on systems analysis and design together with Gary Spurrier. Furthermore, he is co-editor of several large-scale handbooks on IS practice and research.