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Editorial

## Agile government: Systematic literature review and future research

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## ABSTRACT

Governments need to adapt to changes in their internal and external environments and create systems that allow them to scan trends, identify developments, predict their potential impact on the organization, and quickly learn how to implement changes to their standard operating procedures. As a response, government organizations are adopting agile approaches as part of their process redesigns, project management, and software development approaches. Although agility and adaptiveness are long in use in the private sector, they have been increasingly adopted in the public sector literature and practices. In order to understand the existing theoretical and practical foundations of the field, we have conducted a systematic literature review and identified four streams of research areas: (1) software development approaches, (2) project management approaches, (3) application areas, and (4) potential outcomes. In this article, we synthesize this literature, provide an outlook on future research questions, and introduce several articles as part of the current special issue focused on agile government.

## 1. Introduction

Governments around the world have to respond faster to citizen needs, like the expectation of 24/7 availability and personalized access to government services generated by the so-called ‘Facebook generation’. Seamless user-centric experiences on social networking suites, such as Weibo or Twitter, as well as online marketplaces such as Amazon, increase the demand for similar experiences with government services. In addition, industry trends that include Big Data, predictive analytics methods, and Smart City approaches drive the need for governments to create internal capacity and skill sets to evaluate, respond to, and implement new technologies and internal processes.

The previous new public management era has left many government organizations with a reduced skill set and limited capacity to upgrade their IT infrastructure (Dunleavy, Margetts, Bastow, & Tinkler, 2006). As a result, the capability of governments to innovate has been deteriorated due to increasing incentives to outsource, especially IT development and services. The [HealthCare.gov](http://HealthCare.gov) rollout disaster in the U.S. was a clear indication that the role of information management experts in government is oftentimes limited to contract management tasks, such as planning and oversight. One response from government organizations is to create internal innovation labs, organize hackathons, hire Chief Innovation Officers, or try to recruit industry expertise into government, however, it is unclear what success these responses will have on the effectiveness of government IT innovations.

We observe first organizational, structural, managerial, procedural, and technological changes to address the changing internal and external environments of government organizations. As examples, the UK and US governments have adopted new organizational structures in the form of digital services teams that are able to respond faster to ad hoc needs of their internal government clients (Mergel, 2017). They have

adopted an agile government approach designing software in a more information- and user-centric way that is standard in the IT industry. The idea is that once software is developed, it will be shared widely across all levels of government and no longer siloed in one department. In addition to design innovations, governments need to adapt to changes in their internal and external environments and create systems that allow them to scan trends and identify developments, predict their potential impact on the organization, and develop and implement responses (Gong & Janssen, 2012).

While agile methods originate from the software engineering domain, agile government practice extends the focus to a broader spectrum and in this way, it is intended to transform organizational culture and methods of collaboration to achieve higher level of adaptiveness. At the same time, the extensive practice of agile government also requires knowledge and theory to address various challenges and opportunities that governments might face. These challenges include but are not limited to accountability, the potential need for new policy, and information overload, as reported by the articles included in this special issue. Organizations employing agile government approaches would also want to seize the potential benefits and opportunities afforded by making use of social media, big data and emerging forms of new economy such as the sharing economy. It is therefore valuable to discover new applications of agile government approaches and identify the knowledge gaps of current agile government practices in various contexts.

This article provides a brief overview of agile software development, and analyzes and synthesizes the existing literature on agility in government with the goal to provide a shared definition, identify existing research streams, and provide a series of research questions that emerge out of the review. In the following, we will first review the method we applied to conduct the systematic literature review, the

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**Table 1**  
Principles of agile software development.

Principle 1	Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
Principle 2	Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
Principle 3	Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
Principle 4	Business people and developers must work together daily throughout the project.
Principle 5	Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
Principle 6	The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
Principle 7	Working software is the primary measure of progress.
Principle 8	Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
Principle 9	Continuous attention to technical excellence and good design enhances agility.
Principle 10	Simplicity—the art of maximizing the amount of work not done—is essential.
Principle 11	The best architectures, requirements, and designs emerge from self-organizing teams.
Principle 12	At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

Source: <http://agilemanifesto.org/principles.html>

coding approach we have chosen as the basis for our analysis, and provide the synthesis of the current status of agile government.

The article then reviews and summarizes the accepted articles for this special issue on agile government. These articles serve to identify emerging issues, theories, and practices regarding further development of agile government research. In the last section, we will provide a set of open research questions for the government technology community.

## 2. Brief overview of agile software development

This section provides an overview of agile software development as a foundation to the ensuing discussion of agility in government. The review is not exhaustive, but rather selective and intended to describe key principles and concepts.

The notion of agile software development is often traced to the 2001 release of the Agile Software Manifesto (<http://agilemanifesto.org/>), which is founded on twelve principles (see Table 1) that serve primarily as guidelines for agile software development. According to Dingsøyr, et al. (2012:1214), “At its core, agility entails ability to rapidly and flexibly create and respond to change in the business and technical domains.” More broadly, agility refers to the ability of organizations to be nimble and adapt quickly to changing needs and demands, or what Cockburn (2006) describes as a methodology that promotes maneuverability and speed of response.

In their overview article, Dingsøyr et al. (2012:1214) identify several key emergent definitions of agility (see Table 2). Though these definitions provide variations on the notion of agility, they include common themes of efficiency, cost effectiveness, leanness, speed, flexibility, quality, and simplicity.

Although a majority of the literature promotes the positive aspects of adopting agile methods, Fridman (2016) identifies five leading disadvantages of agile methodologies: 1) Less predictability due to the inability to quantify the full level of effort required; 2) More time commitment necessary due to the close communication required across teams involved in the effort; 3) Greater demands on developers and clients (e.g., training, participation); 4) Lack of necessary documentation due to the just in time nature of development; and 5) Potential for projects to get off track due to continually redefined needs.

The above brief overview provides context regarding agile methods and development as derived from the private sector. This special issue focuses on agile methods in government and the extent to which these

**Table 2**  
Selected definitions of agile software development.

Henderson-Sellers and Serour (2005)	The ability to adapt to different changes and to refine and fine-tune development processes as needed
Lee and Xia (2010)	The ability to efficiently and effectively respond to and incorporate user requirement changes during the project life cycle
Conboy (2009:340)	The readiness “to rapidly or inherently create change, proactively or reactively embrace change, and learn from change while contributing to perceived customer value (economy, quality, and simplicity), through its collective components and relationships with its environment.”

Source: Dingsøyr, et al. (2012, p. 1214).

methods translate – and in what ways – to the public sector. The ensuing section presents the methodology used to identify key factors, approaches, and uses of agile methods by governments.

## 3. Methodology

### 3.1. Search strategy

Agility and adaptiveness are keywords that have become popular in mainstream media, particularly in relation to private sector organizations, but are less well documented in the public sector and information technology literature. In order to understand the way that researchers have studied these concepts in the past, the authors conducted a systematic literature following the PRISMA method (Moher et al., 2009). According to the PRISMA statement (Liberati et al., 2009), the method helps researchers summarize existing evidence according to an explicit, rigorous, and transparent step-wise process. The authors identified the keywords and sources, followed by screening the results for eligibility and deciding which sources to include.

### 3.2. Identification of sources

The review was limited to articles and conference proceedings that were published during the last 30 years (1988–2018). We chose this rather long timespan to increase the inclusion of possible sources. We included Web of Science and Google Scholar as our main databases, and our initial search used the following pre-defined keywords: adapt\* AND government, flex\* AND government, agil\* AND government. This initial search yielded over 100,000 hits.

*Inclusion criteria* focused on substantive criteria (i.e., the references had to be published in the context of public management and information management), publication genre (only books, book chapters, and peer-reviewed articles were deemed as academic texts), and their availability in full-text format. We decided to reduce the number of articles for the review by limiting our search only to the (1) the title of the text, (2) the abstract, and (3) the keywords and keywords plus fields, an algorithm that provides expanded terms stemming from the record's cited references or bibliography. After removing duplicates and articles that did not hold to the criteria listed above, this search led to an initial number of 229 references that served as a starting point for our review. Using both automatic search criteria and review of the

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