

## Aspirations and Realizations: The Smart City of Seattle

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### Abstract

*Smart city initiatives have been launched on every continent. That notwithstanding the concept of “smart city” has remained ambiguous. We systematically interviewed officials of an acclaimed Smart City (Seattle) and explicitly asked the officials for their own definitions of “smart city,” which we then compared to the respective projects run by that City. While the definitions given by the practitioners were found different from those in the literature, the smart city projects lived up and matched the practitioner definitions to a high degree. We document the projects and their expected and realized benefits, which illustrate where a leading City government is headed in terms of smart government. However, “Smart City” initiatives in local government might be only a steppingstone in making the greater urban space a “smart city,” which appears to be a more challenging undertaking.*

### 1. Introduction

The term “smart city” appeared in the trade press, in vendor communications (for example, IBM, Oracle, and Siemens), and in the academic literature around the turn of the millennium. It is an obvious literary device used to conceptually describe an urban space, which has successfully addressed challenges of crowding, crime, sprawl, traffic congestion, waste, energy overconsumption, pollution, divides, government red tape, and bureaucratic inertia to name a few. However, so far no widely accepted definition of smart city has emerged, and its meaning has remained somewhat lofty and nebulous.

With this paper, we attempt to shed light on what a smart city might practically mean in the context of local government. We were interested in learning what practitioners, that is, government officials, understand by “smart city.” We further wanted to see what was practically done to further the idea of a smart city, and what benefits results from such undertakings. It intrigued us to uncover, how the project orientations

and resulting benefits would match up with the vision and notion of a smart city as defined by the practitioners themselves. This would we hoped lead us to discover gaps between aspiration and realization, and also gaps between the academic understanding hitherto and the practical realities of a smart city. The case we used (Seattle) has been touted as a modern, forward-looking, technology-savvy, and innovative city with a population of some 650,000 and a city government that matches the ambitions and aspirations of its stakeholders, many of whom (for example, Amazon, Boeing, and Microsoft) are leaders in their respective high-technology fields.

The paper is organized as follows: first, we review the academic literature on smart city. Next, we formulate our research questions and describe the methodology used. This is followed by the presentation of our findings. Then, we discuss the findings and conclude that smart government appears as a necessary but not sufficient prerequisite for making complex and multidimensional urban spaces livable, energy-efficient, clean, safe, sustainable, competitive, attractive, and affordable, along with other qualities which might add up that give the term “smart city” a practical meaning and a measurable quality.

### 2. Literature Review

Various attempts have been made to academically define and conceptually describe a “smart city”, for example [3, 4], [8, 9], [10], and [18]. However, no generally accepted academic definition for a “smart city” has emerged so far. In the following, we highlight the most frequently mentioned concepts of “smart cities” that we found in the literature.

Giffinger et al. [3] created a smart-city ranking scheme based on certain urban characteristics. They identified six categories, in which a city’s smartness could manifest itself: economy, people, governance, mobility, environment, and living. Along those categories and based on a number of factors and indicators the authors ranked 70 cities within the European Union (EU). While several smart city

initiatives have been carried out in European cities on grassroots level, the European Commission has also developed a Smart Cities and Communities Initiative, whose major objective has been to reduce energy use by 2020 and to develop a low-carbon economy by 2050.

Hollands [11] found three variants of “smart city” projects or initiatives: smart city as (1) a celebratory label, (2) a marketing hype rather than a practical engine for infrastructural change, and (3) a loaded term carrying an uncritical, pro-development stance. For the author serious smart city projects consider human capital as the most important component.

Leydesdorff and Deakin [12] introduced a Triple-Helix model of smart cities, which emphasizes smart cities as a process of cultural reconstruction underpinned by policy, academic leadership and corporate strategy in their guidance. Simultaneously, the Triple-Helix model frames the relationship between industry, government and academia as reflexive and as an overlay that influences how technologies co-evolve.

Nam and Pardo [13], in turn, introduced a smart city model of Three Dimensions, that is, technology, people, and institutions, by which smart cities strategize. They view a smart city as model for improving city government services and economic development catalyzed by local governments. In all smart city models they analyzed the authors found a recurring theme of variable social components linked with technologies aiming at transforming economy, environment, and community.

So far, the most comprehensive and integrative framework for analyzing smart city projects has been presented by Chourabi et al. [2] who identified a set of eight dimensions to understand smart city initiatives. The eight dimensions include (1) management and organization, (2) technology, (3) policy, (4) governance, (5) people and communities, (6) economy, (7) built infrastructures, and (8) the natural environment (see. Table 1).

Dimensions	Meaning
Technology	Technology used as infrastructure, backbone, enabler, and facilitator of initiatives and for meeting/overcoming challenges.
Management and organization	Managerial and organizational factors influence projects broadly, such as project size, managers’ attitudes and behavior, organizational diversity, alignment of organizational goals, and compliance to change.
Policy	The policy environment of the initiative, that is, the relationships

	between political factors, e.g., mayor-council or council-manager, and institutional factors, e.g., law, regulation, code, and inter-governmental agreements.
Governance	The governance model, the authority, and the involvement of stakeholders in the initiative
People and communities	People and communities of the city affecting and affected by the implementation of smart city initiatives.
Economy	Economic inputs to and outcomes from smart city initiatives, such as business creation, job creation, talent attraction, workforce development and retention, and improvement in productivity.
Built infrastructure	The impact of the initiative on improving and leveraging the built infrastructure.
Natural environment	The impact of the initiative on preserving and protecting the natural environment.

Table 1. Smart City Initiatives Framework [2]

As Chourabi et al. [2] maintained, modern information technology (IT) appears to be at the core of any smart city initiative or project. However, with the technology challenges to security and in terms of technical skills are associated, which need to be addressed. Managerial and organizational factors influence government projects broadly. These include: project sizes, managers’ attitudes and behavior, organizational diversity, alignment of organizational goals, multiple goals, compliance to change, and jurisdictional integrity.

The managerial and organizational dimension is interwoven with the policy context. The legislative settings (laws, regulations, codes, statutes, and intergovernmental agreements) and the City’s governance structure (council/elected mayor or council/appointed city manager) influence the nature, potential scope, and the likely outcomes of a smart city initiative. The policy context may or may not be nurturing to the smart-city initiative. Either way, it also deeply influences the model of governance used for and within smart initiatives, which might range from hierarchical to network approaches.

Smart city initiatives have been touted for an orientation towards citizens and communities. Both individual citizens and communities can affect smart city initiatives and can also be affected by the

initiatives. Smart city initiatives typically aim at benefitting citizens and communities and also at actively involving them.

The initiatives also have economic impacts and are sometimes directly geared at increasing the city's competitiveness, fostering business development, job creation, and talent attraction, developing and retaining the workforce, and improving productivity. Quite a few smart city initiatives are also directed towards preserving and protecting the natural environment and improving and leveraging the built infrastructure.

As outlined above, the eight smart city dimensions influence and permeate each other to various degrees. This multi-dimensional understanding of smart cities and the initiatives designed to help cities and city governments to become "smart" inspired our research.

### 3. Research Questions

As we pointed out, "smart city" serves as an umbrella term for a wide-ranging array of definitions and understandings as well as practical initiatives and projects. This paper aims to advance the understanding of smart cities in practice and by practitioners. Little is known about how practitioners see and define a "smart city." As far as we know actual practical projects aiming at making a city smart have never been systematically juxtaposed to the practice and practitioner definitions and understandings of a "smart city." In this study we attempt to narrow this gap of knowledge and try to answer the following research questions:

*Research Question #1 (RQ#1):* How do city officials define a "smart city"?

*Research Question #2 (RQ#2):* What are actual smart city projects and initiatives about and how do they match up with these definitions of "smart city"?

### 4. Methodology

With our exploration we hope to help build and further develop theory on what makes a city (and a City government) smart, and what characteristics smart city projects in practice might have.

*Instrument.* Although the extant theory is not comprehensively developed, we used it as a basis for developing a semi-structured interview instrument [14, 16] and [7]. In particular, we incorporated elements of

the eight-dimensional Smart City framework into our study [2]. However, we also anticipated that we would identify additional concepts in a grounded fashion, which is why the instrument was deliberately structured only in part [5, 6, 17].

*Sample.* In various departments including the central Department of Information Technology (DoIT) the City of Seattle employed some 400 IT and IT-related professionals at the time of our study. We conducted twelve interviews, which were purposively sampled [15], with sixteen management-level city IT officials and senior IT professionals from various departments within a period of three months.

*Data collection:* Interviews were conducted in person and lasted between forty-five to seventy-five minutes. All interviews were audio taped, transcribed, and coded by at least two coders for analysis. During the interviews also notes were taken and participant interaction was observed and recorded.

*Data analysis and coding:* In total, 150 codes and sub-codes were used for coding the data, 114 of which were derived ex ante from extant theory (the Smart City framework [2]), while 36 codes were derived from the data (open coding, [16]). That is, we incorporated a hybrid approach for data analysis and theory evolution [7]. The codes were pre-clustered into eleven groups of categories (general information, defining smart city, project description, management and organization, technology, governance, people and communities, policy, economy, natural environment, and built infrastructure, the latter eight of which correspond to the Smart City framework, [2]). Independently, both researchers coded the transcripts using a cloud-based software tool for qualitative and mixed-method data analysis (Dedoose 4.2.83). The coded data were compared one by one and demonstrated high inter-rater reliability.

For this study, the clusters (main categories) of general information, defining smart city, and project description were analyzed. After the open coding an axial coding process was applied, during which the converged main categories/clusters and subcategories were further analyzed regarding their inherent structures and processes leading to paradigms, whose internal relationships were identified wherever possible [16].

*Interview categorization:* Also independently, the two researchers categorized all interview transcripts with regard to pre-defined descriptors of project orientation (technology focus, service focus,

technology and service foci), emphasis (internal, external, internal and external), and participation (intra/inter government, non-government, intra/inter government and non-government). The descriptors were then compared and discrepancies of categorization discussed and resolved.

## 5. Results

### 5.1. How Do Practitioners Define a “Smart City” (RQ#1)?

With an open-ended question, we asked the interviewees about their ideas and their definition of a “smart city.” Our results indicate that in the officials’ view a “smart city” mainly refers to “Smart City Government” rather than to the city as a complex socio-economic urban space (including the City Government). From the high frequency of code occurrences in the transcripts, we infer that city officials’ main orientation with regard to “smart city government” is directed towards *information integration* in terms of both technology and service.

A smart city (government), as portrayed by city officials in the interviews, therefore has predominantly an internal emphasis, and it encompasses intra- and inter-governmental participation. As one interviewee put it:

If you have a barricaded shooter and the police block off a section of the downtown area, it’s a real challenge getting that word out to all the other departments who may be coming in to fix a utility pole, or fire has an emergency, want to drive right through the area. And so, right now that’s all handled, really, manually. People just have phone lists, “Oh, we’re doing this, be sure you don’t interrupt us here”. So with Common Operating Picture the hope is, everyone will have that on their screens, and they can go to an application and see what’s happening in an area. Alerts will be proactively pushed to the right people.

According to many interviewees, a smart city is also about *proactive service* and government action internally as well as interaction with citizens. Proactive service was understood to be also about service innovation and integration, interactive service, and service of high quality. One interviewee commented:

A “Smart Utility” is one that uses technology to facilitate and streamline interactions between its customers and the back office. And that can be anything from metering, to web, to service requests and web requests, to emergency and response types

of issues. And so, being smart, I think, is the innovative ways in which we can facilitate that interaction with our customers.

With less frequency, “smart city” was also related to *smart grids* (that is, smart traffic grid, smart electric grid and metering, and smart utility), which are characterized by interactivity, effectiveness, efficiency, mobility, and infrastructure integration. One of the interviewees said:

From the electric utility perspective, you would understand, where your electricity is being used, who is using it when, be able to predict how much they are going to use, be able to know when it’s out, be able to restore it as quickly as possible, send your crews out as efficiently as possible to restore power when it goes down, know where you should be doing vegetation management, know where you should be doing field and stream management, operate the dams most efficiently.

Only a few interviewees thought that a smart city (that is, smart City Government in most interviewees’ perspective) is also about *openness*, referring to open/transparent government, open data, efficient and effective resource usage, and energy efficiency. One said:

Helping to align the IT departments within the city to get them talking more together and figure out how they can—I don’t think it’s so much utilize information to help each other as it is to help our constituents out there, to let the public know better what we’re doing and when we’re doing it and how we might be impacting their street or their electricity. Finally, smart city is about culture and people centric. One said: I think that a smart city is one which is taking community needs and values and using that to drive its choices about how the city is run.

Interestingly, to a few, echoing Hollands’ concerns, smart city is just a buzzword that is undefined or a fad. As one interviewee said: “*We don’t have anything resembling a smart city initiative nor should we.*”

In summary, the definitions and descriptions of a “smart city” that we heard from City officials (IT and business managers) can be abstracted like this:

The term “smart city” (a) mainly refers to Smart City government. In that, (b) it manifests itself via proactive action and service to and interaction internally as well as with citizens, businesses, and other government entities. Furthermore, (c) it provides “smart grids” in terms of traffic, power, and communication, all of which lead to improved efficiency, mobility, and infrastructure integration. Also, (d) “smart City government” is about openness,

that is, open and transparent governing, open data, and effective/efficient use of resources. Finally, (d) a “smart city” is culture and people-centric.

Comparing this practice-based definition to Giffinger et al [3], Nam and Pardo [13], and Chourabi et al.’s [2] definitions it strikes that the practitioner definition by and large refers to “smart government” while the literature definitions go beyond the governmental realm and include elements or even the entirety of the urban space.

In the next section, we present the projects and initiatives, which the City actually pursues, which then can be compared to this summary definition.

## 5.2. What are Actual Projects About and how Do they Match up with the Smart City Definition (RQ#2)?

We address the first part of the second research question (what are the actual projects about?) in this section, while we cover the second part (how do they match up with the Smart City definition?) in the Discussion section. In order to answer the first part of the second research question, we had to first identify the projects, to which the practitioners referred as their City’s smart city projects.

Quite a few projects we identified were found closely related and interconnected. In Table 2 we list the smart initiatives/projects undertaken in Seattle at the time of our study (fall 2011), all of which were discussed during the interviews. The project list is quite extensive showing a total of 24 projects including those, which are closely related to each other.

# of proj.	Project Name / Project Group	Main Orientation
2	<b>Data.seattle.gov; Seattle.gov:</b> The City’s Web portal and public access point to information and services	Government external
4	<b>Community Technology Planner:</b> People, especially underserved communities, are able to access and use computers and the Internet. Related projects: <b>Equitable Justice Delivery System; communities Online Project; Puget Sound-Off.</b>	Government external
6	<b>Smart Grid:</b> It is the synergy between all systems and components that allows for two-way communication between the utility and its customers. Its benefits include: efficiency and reliability improvement, economic development, and sustainability of	Government internal and external

	electricity services. Related projects: <b>Automated metering infrastructure (AMI); Meter Data Management; Electric Vehicle Infrastructure; Pacific Northwest Regional Demonstration Project.</b>	
2	<b>Fiber to the Premise:</b> Homes, apartments, and businesses connected with fiber cable at 100 megabit or gigabit speeds to improve availability of broadband. Related projects: <b>GigU</b>	Government internal and external
2	<b>Customer Relationship Model (CRM):</b> Using mobile technology in the government-customer relationship. Related projects: <b>Mobile computing/mobile apps.</b>	Government internal and external
1	<b>Supervisory Control and Data Acquisition (SCADA):</b> Building a data warehouse intended to provide business intelligence and make good decision for the least amount of money.	Government internal
2	<b>Drainage and Waste Water System:</b> Building a sewer system able to handle heavy rain more effectively. Related projects: <b>Rain Watch Program</b>	Government internal
1	<b>Field Operations Mapping System (FOMS):</b> GPS-based system to streamline and manage logistics, field operations, assets, and field crew dispatching through map interface in real time.	Government internal
1	<b>Common Operating Picture:</b> A common view of data in various forms to be available for different departments. Alerts will be proactively pushed to the right people.	Government internal
1	<b>IT Cloud:</b> Moving IT services and data into the cloud	Government internal
1	<b>Electronic Plan Review System:</b> electronic submission of plans for review.	Government internal
1	<b>Digital Evidence Management System (DEMS):</b> A central repository of electronic data and evidence is created for police activity.	Government internal

Table 2: City of Seattle’s smart city projects

Six smart-city projects at the City of Seattle had a government-external orientation (that is, toward citizen or business), ten projects were oriented both internally

and externally, while eight projects had an internal-only orientation. In other words, from this high-level perspective the projects appeared to be almost balanced between an internal and external orientation, although with a slight tilt toward government-internal business.

5.3. Benefits of Smart City Projects

Next we had to understand, why City officials categorized the projects in the list as smart, and what had motivated the projects in the first place. We inferred that this would become visible when understanding the potential benefits the projects were expected to produce (see Figure 1). We further assumed that both the order and frequency of mentioning certain benefits when asking for the project motives during the interviews would point at the first and foremost motives. In fact, in the data we found ample evidence for this assumption.

*Service improvement* and *cost savings* were the most frequently and foremost mentioned benefits and motives for launching the project as well as for project outcomes. *Information sharing and integration*, on the other hand, was of far lower priority.

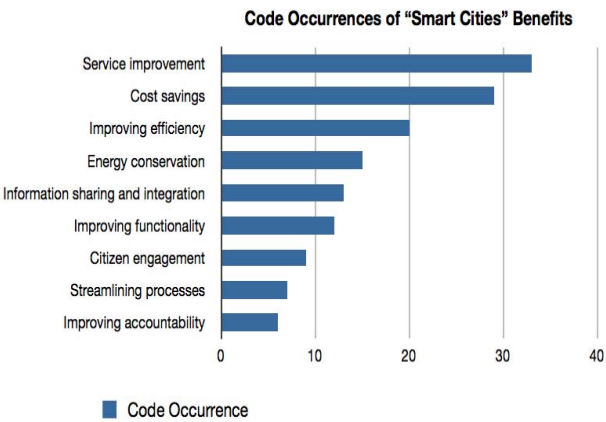


Figure 1: Code Frequency of “Smart City” Benefits

When analyzing desired and expected benefits from the projects mentioned, we found that several benefits co-occurred and were related to each other; for example, service improvement co-occurred with streamlining processes and functionality improvement. We also found cost savings, which ranked second, clustered with efficiency improvement and energy conservation. Finally, the benefit of citizen engagement was clustered with improving accountability but showed a relatively low overall

ranking indicating a lower importance in the projects in focus.

These results were further qualified when we compared the code occurrences for project benefits to the categories of transcripts (see methodology section): Over 94 percent of the codes for benefits mentioned were found in transcripts with a project orientation on both technology and service. Also, 74 percent of the codes for benefits occurred in transcripts with an emphasis categorized as internal. Finally, 60 percent of the benefits-related codes were found in transcripts that had been categorized as representing intra-/inter-governmental and non-governmental participation in the projects, while 41 percent of those codes were located in transcripts with a focus on intra-/inter-governmental participation (see Figure 2).

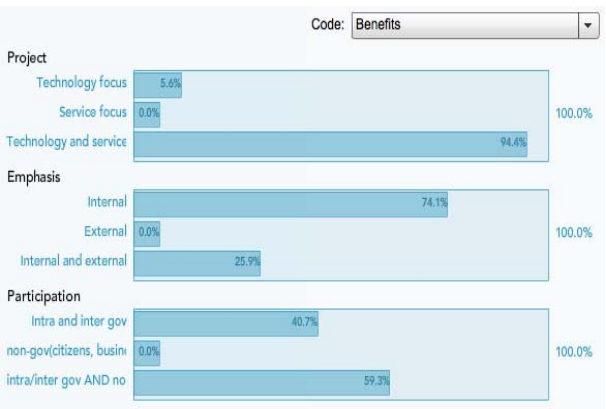


Figure 2. Benefit Occurrence in Transcript Categories

Next, we investigated the code frequencies in major projects. The major projects that we found were (1) Smart Grid, (2) AMI, (3) Fiber to the Premise, and (4) (data.)seattle.gov. Not only were they mentioned and discussed the most, they also appeared as the best resourced projects under investigation. Interestingly, the nature of the desired benefits indicates that smart city projects mainly have a focus on government-internal business (see Table 3).

Like in the overall project breakdown, service improvement, cost savings came out on top of benefits in terms of code frequency followed by energy conservation. Interestingly, the AMI project showed the highest code totals in all listed benefits.

Project Names / Benefits	Smart Grid	AMI	Fiber to the premise	(data.)seattle.gov	Totals
Service improvement	9	16	7	11	43
Cost savings	12	15	0	4	31
Energy conservation	13	15	1	0	29
Improving efficiency	5	13	1	8	27
Improving functionality	4	8	6	5	23
Information sharing and integration	3	9	8	2	22
Streamlining processes	0	4	4	3	11
Improving accountability	2	3	1	1	7
Citizen engagement	0	0	0	0	0

Table 3: Code Frequency for “Benefits” in Major Projects

While the Smart Grid project mostly focuses on energy conservation, cost savings and service improvement, it places less emphasis on improving efficiency, improving functionality and information sharing and integration. Fiber to the premise, conversely, is more focused on information sharing and integration, service improvement, improving functionality and streamlining processes than on energy conservation, improving efficiency and improving accountability. On the other hand, (data.)seattle.gov mainly highlights service improvement, improving efficiency, improving functionality and cost savings over information sharing and integration, streamlining processes, and improving accountability. Citizen engagement was not prominent, or more precisely, not even mentioned in any top-4 project (see Table 3).

In summary, although at first sight the smart city projects appear fairly balanced with regard to a government-internal perspective as opposed to a government-external perspective, a closer inspection reveals that internal benefits such as service improvement and cost savings prevail. Also, the major emphases both in terms of motivation, purpose, and expected benefits clearly lie on government-internal business.

## 6. Discussion

In the literature as well as in our study, the concept of a “smart city” appears in various guises, and as we had already found in the literature, no widespread agreement exists regarding what a “smart city”

encompasses. While the literature extends the definition beyond the realm of government into parts or the entirety of the urban space, our interviewees’ definition mainly referred to smart City government. Yet, among our interviewees we still did not find a unified view of the smart city either, although certain overlaps in perspectives were clearly identifiable.

At a minimum, we detected two elements to be present in all smart city-related presentations and discussions as well as in our findings: (a) a policy orientation along with the political will aimed at becoming smarter in government actions and interactions (both internal and external), and (b) the reliance on modern information technology as a backbone and enabler for doing so. In the following part of the discussion, we particularly address the second portion of the second research question (*RQ#2*), that is, how do the smart city projects match up against the officials’ smart city definition.

*Aboutness of Smart City.* Unlike a number of academics and also unlike practitioners elsewhere, the City of Seattle officials clearly understood under “smart city” first and foremost “smart City government.” This understanding displays itself in 22 of a total of 24 projects dedicated to City government, or almost 92 percent of all smart city projects in the City of Seattle (see Table 4). From an administrative perspective, this government operations-oriented emphasis appears only logical and consequential in terms of the administration’s mission, mandates, and budgetary constraints.

However, some interviewees were well aware and supportive of the more encompassing notion of smart city as a complex and multidimensional urban space that includes all dimensions spelled out in the Smart City framework [2]. Extending the reach of smart city initiatives beyond the administrative confines might be subject to forming coalitions and alliances on political level first such that communities, businesses, and non-governmental organizations can be reached and involved. After all, the genesis of a smart city as a complex and multidimensional urban space has to involve stakeholders well beyond city government. Nevertheless, City officials saw a role of City government in serving as catalyst when advancing the smart city agenda beyond smart government.

*Focus.* In the officials’ perspective (and with the understanding of the smart city as smart government of the City) the focus in the definition lied predominantly in government agility, that is, proactive government action and interaction internally, and with external stakeholders including citizens. Again, we were able to identify almost 92 percent of all smart city projects at the City of Seattle (22 of 24 projects) that addressed



agility and proactivity in government action and interaction (see Table 4). In other words, the focus given in the officials' smart city definition was well matched through actual projects carried out in the City, notwithstanding that the City did not have an official "smart city" agenda at the time when this study was conducted.

*Select Areas and Related Goals.* The notion of smart grids in terms of power, traffic, and communication appeared as important elements in the definition of City smartness. A third of all smart city projects (eight of 22 projects, see Table 4) directly addressed smart grids at our study site. Interestingly, the various smart grid projects revealed a strong emphasis on the management, efficiency, and energy conservation aspects of the grids. A number of City officials also pointed at the benefits for the population at large as well as the increases in urban competitiveness and attractiveness coming with smart grids.

*Openness.* For a number of years before this study was conducted, transparency, accountability, and openness in government had already been a focus in the City's administrative orientation. Hence, it came as little surprise to find openness (including open data and monitored use of public resources) in the definition of Smart City government. Although just two projects (that is, only 8 percent of all projects, see Table 4) could be directly linked to openness, the two projects manifest the City's effort and commitment to this particular aspect of smartness.

Smart City Definitional Elements	City Officials' Definition	City Projects Addressing the Definition	City Projects Addressing the Definitional Elements
<b>Aboutness</b>	Smart city government	22 projects qualified as city-government projects; two projects were seeding projects for communities	91.7%
<b>Focus</b>	Proactive action and service to and interaction internally, with citizens, businesses, and other government entities.	The 22 government-related projects all had identifiable elements of process streamlining as well as intelligence gathering providing for proactive action and interaction	91.7%
<b>Select Areas and Related Goals</b>	"Smart grids" in terms of traffic, power, and communication, all of which lead to improved efficiency, mobility	The Smart Grid project (including five related projects) as well as the Fiber-to-the-premise projects (2) aimed at higher efficiency, higher speed, and mobility	33.3%
<b>Openness</b>	Open and transparent governing, open data, and effective/efficient use of resources	Two renowned projects aimed at openness (seattle.gov and data.seattle.gov)	8.3%
<b>Societal Impact</b>	Culture- and people-centricity	Four projects in total, two of which were seeding projects.	16.7%

Table 4: Smart City Definitions versus Smart City Projects at the City of Seattle

The City has repeatedly been recognized for its technology savviness and as a leader in administrative innovation with regard to its interactive Web portal and open data sites (seattle.gov and data.seattle.gov) winning national awards against the other 275 municipalities with a population of over 100,000 in the United States [1].

*Societal Impact.* Although culture and people were identifiable elements in the officials' smart city definition, a total of four projects (16 percent, see Table 4)) were culture- and people-centric, two of which were community-based seeding projects. While the officials have not lost sight of culture, people, and communities, it is fair to state that other projects and other aspects of smartness dominate in the smart city project portfolio of the City of Seattle.

In summary, the smart city projects at our study site were remarkably consistent with the officials' definition of a smart city. However, the definition the City officials shared with us refers to smart government at local (City) level, that is, City government rather than the complex and multidimensional urban space of a city (including its local government as a part of that urban space). "Smart City" in this practitioner definition and enacted via the described projects is focused on continuous administrative innovation enabled and facilitated by modern information technology. Citizen-, communities-, and culture-oriented projects appeared to play a second-tier role in the overall smart city initiative, at least up to the point when our study was conducted. As mentioned before, the City had not defined an official "Smart City" agenda by the time this study was carried out.

It might be pointless to strive for an exact and coherent academic definition of either "Smart City" (local government) or "smart city" (multidimensional urban space). Rather either term might be more helpful when understood as marking a *conversation* among stakeholders in local government and in the respective urban spaces about where the city and its government are actually going, and where they might need to go (instead). To the authors it appears conclusive that a smart local government is necessary but not sufficient to help make an urban space *smart*.

Smart city in terms of the urban space can, for example, mean among other things that it is attractive, globally competitive, diverse, full of opportunity, forward-looking, equitable, highly educated and versatile, technology-savvy, energy-consumption-wise, safe, environmentally sound and sustainable, livable, and inclusive and participatory to its people, communities, and businesses. Entertaining and



maintaining a conversation among stakeholders about both “smart city” and “Smart City” might help aligning ideas and interests as well as forging a shared vision about the presence and the future of the urban space and its government, which benefits all stakeholders.

## 7. Conclusion

The object of this paper has been to juxtapose the various definitions of smart city to practical “smart city” projects and to the expected (and realized) benefits of such projects in order to better understand what “smart city” might stand for in practice. We were able to find that the projects and their observed outcomes aligned fairly well with the “smart city” understanding of City officials, although their definition of City smartness differed from those in the academic literature. This led to the distinction of “Smart City” (local government) and “smart city” (complex and multidimensional urban space). Smart government appears as a prerequisite to lead and stimulate an urban space into a composition of resources and an interplay of stakeholders that helps create a “smart city.” Our future research is geared toward further case studies of the phenomenon, which will extend into the areas described by the Smart City framework [2]. This will allow us to conduct comparative case studies of cities aspiring to become smart.

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