THE APPLICATION OF ACTIVITY BASED COSTING FOR DATA ANALYSIS IN CORRECTIONAL PRACTICE

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ABSTRACT

This paper develops an Activity Based Costing (ABC) model that shows how big data can be used in an integrated method to holistically and systematically manage the financial and operational aspects of a jail or prison system. By linking financial and accounting resources to activities or processes, and activities to cost objects, benchmarking comparisons using costs drivers and performance measures can be made across different entities. The ABC model can be used for a wide variety of reasons, including process analysis, management and budget control, cost reductions, safety improvements, team performance, quality control and productivity.

Keywords *- activity based costing, jail and prison data and performance measures*

INTRODUCTION

New York City has recently embarked on a plan to close the Rikers Island jail complex and replace it with a smaller and decentralized network of modern jails in an effort to effectively manage the jail population by reducing the cost, size and density (NYC Mayor's Office of Criminal Justice (2018), NYC Mayor's Office of Criminal Justice (2016a). Their stated goals are three fold:

Create a smaller jail system by reducing the average daily jail population (ADP) density to 7,000 in the next five years.

Create a safer system for jail employees and well as those who are incarcerated.

Create a fairer system by improving the culture inside city jails through the professional development of corrections officers, and in promoting educational, vocational and recreational programming for incarcerated people to help reduce future returns to jail.

One part of NYC's plan to minimize the risks to public safety and maximize correctional staff effectiveness is the application of data and analysis in correctional practice. Particularly, the planning includes program evaluation, performance management, analytics and metrics using administrative big data to help fight crime.

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The main goals of this paper are to describe a model based on the two dimensional (cost assignment and process) views of ABC principles that can aid in the daily and long-term strategic management of data in a correctional setting.[1]

Secondly, this paper addresses some of the recommendations by (Perrone and Pratt 2003) that prison research should move beyond the case study approach; equal weight should be given to both management operational practices and budgeting concerns; and a reliable set of metrics developed that could be contained in a centralized database for empirical research. Activity Based Costing is an integrated method that can be used to holistically and systematically manage data that are associated with incarceration at the city, state or federal level.

BENEFITS OF AN ABC MODEL

Brown et al. (1998); Kumar and Mahto (2013); Oseifuah (2014) suggest than when the cost assignment and process views are combined in an ABC model, they provide an integrated approach to productivity measurement by:

- the comprehensive monitoring of daily, weekly, monthly or quarterly views of an organization's efficiency and effectiveness. This picture can be a view as shown on dashboards or scorecards for real-time decision-making by senior executives or front-line managers.
- easily measuring the financial, economic and statistical relationships among activities, processes, sub-processes, cost objects and performance indicators so that costs can be controlled and reduced.
- detecting mis-allocated (wasted) resources or performance (leadership) weaknesses earlier and corrective measures applied sooner.
- benchmarking unit costs and performance measures against other city, state and federal or private corrections facilities to improve an organization's performance or ineffectiveness.
- determining which resource costs can be centralized at the budgeting stage and what activities (along with their share of expenses) can be decentralized to various cost objects.

As an example, an ABC model is applied to NYC's Department of Corrections to show how the roles financial, accounting, economic, statistical, operational and psychometric data play in a correctional (jail) setting. The model provides a snapshot of how an organization can effectively and efficiently monitor productivity or performance measures over time, manage limited resources or diagnose gaps that might require corrective action.

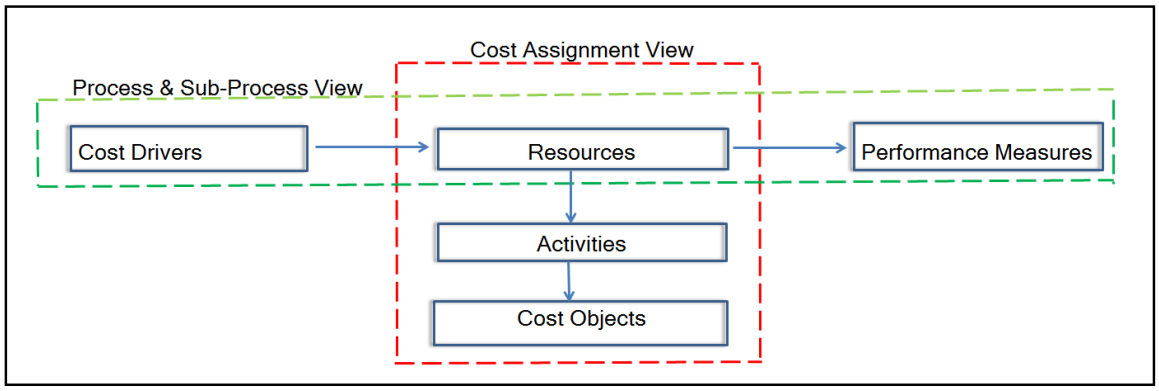
Theory Review

Cooper and Kaplan (1991); Turney (1991) popularized the theory of ABC as a method to measure the assigned costs of activities or processes, cost drivers and performance measures in a business enterprise using accounting, financial and performance data. ABC has been used as an alternative to the traditional method of cost accounting in which overhead costs were tracked to product units. ABC models were designed to capture the

economics associated with manufacturing processes, but it can be easily applied to service organization as well (Melese, Blandin, and O'Keele 2004).

An extensive review of ABC systems that have been implemented by large companies and the public sector is discussed in (Kumar and Mahto 2013). In our public sector ABC model the activity costs associated with fighting crime or minimizing public safety and maximizing team effectiveness are assigned to cost drivers such as average daily population (ADP).

Figure 1: ABC Model



The Two Dimensions to Activity Based Costing

Figure 1 shows the two dimensions, the cost assignment and process views associated with an ABC model that has been adapted from (Turney 1991, p. 81). The model was designed to provide managers and other stakeholders with the data necessary for critical decision-making, process improvements, and performance management.

Cost Assignment View

First, there is the vertical cost assignment view in which the building blocks are financial resources, activities and cost objects. The underlying assumption is that cost objects create the need for activities, and activities in turn create the need for resources (Turney 1991, pp. 80-82).

Resources are the financial and economic elements needed for performing an activity or process. These resources may be city, state or federal allocated funding for a particular activity.

Activities are the work performed by personnel and can include the activities involved in the arrests, arraignment, disposition and sentencing of inmates.

Cost objects are work units for which a separate accounting or budgeting process may be involved. For example, in disbanding Rikers Island and decentralizing the jail population (but centralizing the cost allocation functions) in New York City, a cost object can be broken down by the five boroughs of Brooklyn, Queens, Manhattan, Bronx and Staten Island or consolidated as needed.

Process View

Second, there is the horizontal or process view in which the building blocks are cost drivers, activities (process and sub-processes), and performance measures. The process view reflects what causes work and how well its performed (Turney 1991, pp. 80–81).

Cost drivers are factors that quantity the frequency of work load, the demands required to perform an activity (Turney 1991, p. 86).For example, the numbers of arrests are driven by the number of felonies and misdemeanors committed on a given day.

Performance measures describe how well, efficient and timely a particular activity was performed. Performance measures can also reveal the areas that need improvement or suggestions for staff training or re-training. Performance measures can include financial and non-financial data such as reliability and validity of risk assessment instruments (Austin 2004; Entorf and Sattarova 2016).[2]

Data, Methodology and Model Development

ABC systems evolved from the earlier and conventional cost accounting methods in which overhead fixed and variable input costs such as capital, labor, energy, materials, services and other expenses (KLEMSO) were allocated to a product line or cost center.

The two-dimensional ABC approach was designed to provide additional data for both internal and external analysis while retaining some of the traditional cost accounting methods. Budget, financial and gap analysis (budget versus actuals) still play key roles in ABC models; it is just that they are tied to specific cost drivers, activities or processes and performance measures.

Linked Activities in Correctional Practice

People enter the criminal justice system based on a series of decisions made by law enforcement officials such as police officers, judges, prosecutors, defenders, and the defendants themselves. As shown in Table 1, police officers must often decide whether or not to arrest someone when certain crimes are committed. Arrests can be classified as either as a felony or a misdemeanor. These decisions initiate the correctional process and often lead to increases or decreases in the jail population.

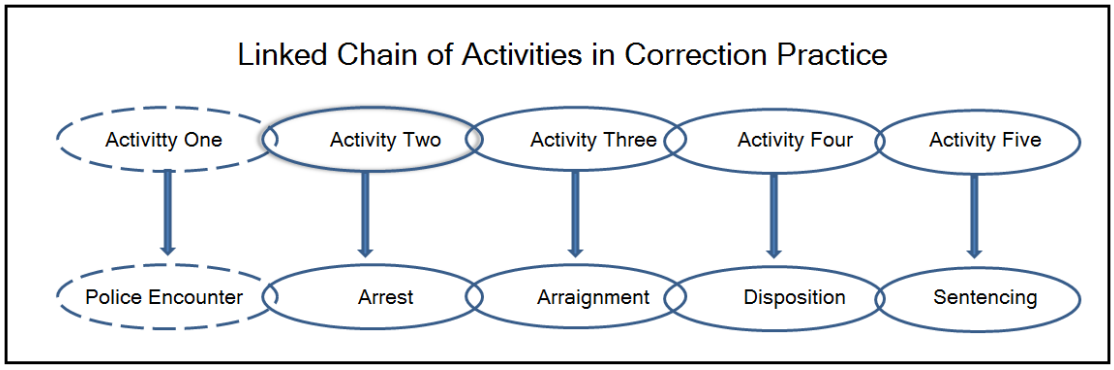
Prosecutors and judges often decide on the severity of felony or misdemeanor charges, whether to dismiss charges, reclassify charges or proceed to trial with risk assessment decisions on whether or not to grant bail. Bail is usually decided based on statistical risk assessment factors such as a defendant's threat to public safety or flight risk, which is a failure to appear in court at a later date (Austin 2004).

Table 1: Decisions that Drive the Size of the Jail Population

Decision Maker	Decisions Made
Defendant	Commit a Crime or Not
Police Officer	Arrest or Not Arrested
Prosecutor	Level Charges or Not
Judges	Dismiss a Case, Set Bail, Remand (No Bail),
	Release With or Without Conditions

Crimes committed by individuals often lead to police encounters. Police encounters begin the law enforcement process that is shown in Figure 2 as a linked chain of police encounters, arrests, arraignment, disposition and sentencing activities. The goal of these activities is to fight crime by reducing the risks posed by criminals to public safety.

Figure 2: Linked Activities in Correctional Practice



In a concrete example of the correctional process with clearly defined activities, shown in Figure 3, there were 674,000 police encounters in NYC in 2016 (NYC Mayor's Office of Criminal Justice 2016b , p. 6).

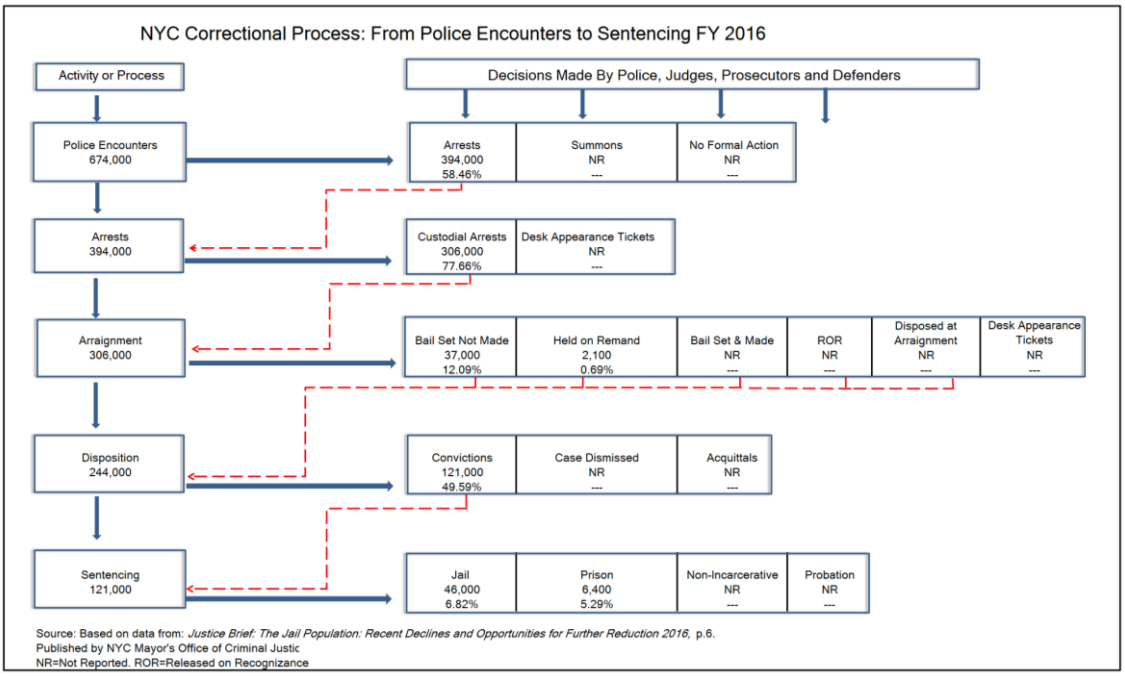
Police encounters can result in arrests, summons or no formal action taken, depending on the crime that is involved. Summonses, summon warrants, and stop and frisk encounters are unlikely to result in jail admission in New York City (NYC Mayor's Office of Criminal Justice 2016b, p. 28).

Some arrests are resolved with desk appearance tickets at the time of arrest or following arraignment. From the 674,000 police encounters, 394,000 arrests or 58.46% of the total were made and that resulted in 306,000 arraignments.

At arraignment, some defendants were released on their own recognizance to appear later in court. Some cases were disposed of at the time of arraignment because of adjournment to dismiss, the defendant plead guilty to the charges and would be sentenced later or some other reason.

The number of defendants held on remand totaled 2,100, meaning no bail was granted, and another 37,000 were granted bail but were unable to make payments. The number of defendants in which bail was set and made was not reported.

Figure 3: NYC Correctional Process



Following the arraignment process, 244,000 cases followed through to the disposition or trial stage. At the disposition stage, cases were resolved through case dismissals, acquittals or convictions. Defendants that were convicted could be sentenced to a non-incarcerative program, probation, jail or prison. Following their 121,000 convictions, 46,000 defendants faced jail, that is a sentence of less than one year that is served in a city jail, while another 6,400 defendants were sent to state prisons for longer sentences. The other defendants received probation or non-incarcerative sentences.

Table 2 reveal a few interesting facts about police encounters and convictions in NYC in 2016. For example, approximately 38.02% of convictions resulted in a short jail sentence of less than one year and 5.29% of convictions resulted in a prison sentence for a total of 43.31%. The remaining 56.69% resulted in either probation or a non-incarcerative form of punishment.

Overall, less than 7% of police encounters in 2016 resulted in a person convicted and sent to jail, while less than one percent resulted in a longer prison sentence.

Table 2: Incarceration as a Percent of NYC Correctional Activity 2016

Activity	Charge	Jail [a]	Prison[b]	Total
(Process)		**Sentenced**	**Sentenced**	
Police Encounters	674,000	6.82%	0.95%	7.77%
Arrests	394,000	11.68%	1.62%	13.30%
Arraignment	306,000	15.03%	2.09%	17.12%
Disposition	244,000	18.85%	2.62%	21.48%
Sentenced	121,000	38.02%	5.29%	43.31%

a= 46,000, b=6,400.

Key Cost Drivers in Reducing Jail Population

The most critical steps in the entire ABC process is to identify the resources consumed for a particular activity and the corresponding cost drivers. The key metrics or cost drivers used by---NYC Mayor's Office of Criminal Justice 2016b---in measuring the reduction in jail populations in New York City are the annual number of admissions, the average daily population (ADP) and the length of stay (LOS).

Admissions are usually a much larger number than ADP because the length of stay (LOS) of each inmate varies by the number of daily discharges. For example, as shown in Table 3, 60,700 inmates were admitted into the NYC jail system in 2016, but the average daily population was only 9,680. LOS varied from short stays for those able to make bail and were in and out to those held on violent felonies.

Table 3: Jail Admissions, LOS and ADP Fiscal Year 2016

Charge	Admis-sions	% Share	LOS	Est. ADP	% Share	Actual ADP	% Share
Misdemeanor [a]	16,400	27.02%	22	988	11.35%	630	6.51%
Non-violent Fel-ony [1]	16,000	26.36%	75	3,288	37.76%	3,000	30.99%
Violent Felony[b]	11,500	18.95%	111	3,497	40.17%	3,600	37.19%
City Sentenced	7,100	11.70%	17	331	3.80%	1,250	12.91%
Other [2]	5,700	9.39%	NR	—-	—-	630	6.51%
State Parole Vio-lations	4,000	6.59%	55	603	6.92%	570	5.89%
Total	60,700			8,707		9,680	

Source: Based on data from: NYC Mayor's Office of Criminal Justice, 2016b, pp. 25-26.

a=Pretrial. NR=Not Reported. b=Warrants or State Holds.

ADP is a key measure (or cost driver) of the number of beds occupied by inmates on any given day in New York City. The formula for its computation is as follows:

Number of Beds = [Number of Individuals Affected] *[Average Length of Stay] / [365]

From Table 3, we see that the total number of misdemeanor charges were 16,400 and with an average LOS of 22 days, 988 beds would have been forecasted, but the actual demand was only 630 beds in 2016. It is not surprising that non-violent and violent felonies required the most beds and had the highest LOS.

Table 4 shows the type of external data (crimes) that drive the internal correction's process in New York City, and we have aggregated several categories for data illustration purposes only. We see that in Fiscal Year 2018 in NYC, the average daily population of inmates totaled 8,974.

Drug (use, possession, sale), other felonies and misdemeanors, robberies and murders made up more than 50% of charges for the year (NYC Department of Correction, 2018). Something counter-intuitive shows up in the table: What has been the impact on the so-called 'war on drugs' on ending drug use and trafficking? For example, drug related crime is the top category in 2018 and it appears as though the resources expended on the 'war on drugs' since the 1960's has actually increased the rate of jail and prison incarceration.

Table 4: NYC Average Daily Population (ADP) Fiscal Year 2018

Charge	ADP	Percent	Cum. Percent
Drug [1]	1,403	15.63%	15.63%
Other [2]	1,260	14.04%	29.67%
Robbery [3]	1,056	11.77%	41.44%
Murder [4]	976	10.88%	52.32%
Assault	953	10.62%	62.94%
Warrants	881	9.82%	72.76%
Burglary	713	7.95%	80.71%
Weapons	650	7.24%	87.95%
Larceny	571	6.36%	94.31%
Sex [5]	323	3.60%	97.91%
Vehicular	131	1.46%	99.37%
Missing	41	0.46%	99.83%
Prostitution	8	0.09%	99.92%
Violations	8	0.09%	100.00%
Total	8,974		

Source: Based on data from: NYC Department of Correction (2018). 1. Sale & possession 2. Other felonies and misdemeanors 3. Robbery, burglary & grand larceny 4. Murder, attempted murder & manslaughter. 5. Rape & sexual offenses.

ADP can be grouped into various categories by demographic profile (race, adolescents, adults, gender, transgender), marital status, risk of recidivism, mental illness, education, residency, employment, drug use, and security risk while detained that we do not show here. All of these categories are the static and dynamic factors required for developing various statistical risk models.

LOS is a measure of how long an inmate has been incarcerated. LOS may decrease due to shorter jail or prison sentences. LOS rates increase due to requirements that inmates serve a higher proportion of their sentences behind bars; missed scheduled court appearances due to logistical transportation issues; court adjournments for procedural matters; unprepared prosecutors and defenders; paperwork delays; and witness participation issues.

It is also not uncommon for defendants to face multiple serious charges which may keep them in custody (increasing LOS) until each individual case is resolved. Some inmates are in and out in a short period, others are held without bail (remand), and may have had bail set but unable to afford it. Inmates convicted of a crime and sentenced to one year or less serve their time in city jails, while sentences over one year are served in a state prison.

In general, increases in the size of the U.S. population and the number of police encounters that lead to arrests each year increase the jail and prison population. In addition, determinate sentencing laws, which include confinement sentences that have fixed or minimum durations depending on the crime committed, have also led to more people being convicted with mandatory prison terms. Determinate sentencing limits both prosecutorial and judicial discretion in regard to both charges filed and sentencing (MacDonald 2013).

In Fiscal Year 2018, the average LOS for NYC jail population was 68 days with 32% of the population detained for fewer than 4 days; 20.7% detained for 3 months or more; 17.2% discharged to NYSDOCCS and 75% discharges to the community

NYC Department of Correction (2018) calculates that to save one bed annually, the system needs to divert or release an average number of inmates and their length of stay as shown in Table 5. For example, approximately 51 inmates with charges ranging from violent felonies to misdemeanors would be have to be released or diverted to save one bed annually (NYC Mayor's Office of Criminal Justice (2016b, p. 26).

Table 5: Diversions or Releases Needed to Save One Bed Annually

Charge	Number of Inmates	Average LOS
Violent Felony Detainees	3	111
Non-violent Felony Detainees	5	75
City Sentenced Individuals	21	17
State Technical Parole Violators	6	55
Misdemeanors Detainees	16	22
Total	51	

Table 6 shows the signs of progress in the decline of the number of admissions and ADP between 2016 and 2018 in New York City. For example, NYC reduced the number of admissions by 11,545 or 18.93%. Its average ADP was reduced by 706 or 7.29% during the same period.

Table 6: Year over Year Change in Admissions and ADP in NYC 2016–2018

	FY2016	FY2018	Change	% Change
Admissions	61,000	49,455	11,545	18.93%
ADP	9,680	8,974	706	7.29%

Sources: NYC Department of Correction (2018); NYC Mayor's Office of Criminal Justice (2016b, p. 6).

In order to reduce the size of the jail population, it is thought that reducing the number of admissions and time in custody (LOS) and revisions to sentencing guidelines are all good correctional policies.

ABC Model in Correctional Practice

The overall financial and economic picture of an organization engaged in work activity is shown by the cost assignment view in an ABC model. Figure 4 shows the vertical or cost assignment view and the horizontal or process view of the correctional process in New York City from the time of arrest to sentencing.

The Cost Assignment View

The cost assignment view gives both a centralized and decentralized accounting view in which operating costs can be traced to cost objects. The three building blocks in the cost assignment view show the flow from financial resource allocation (city, state or federal) to activities (arrests, arraignment, disposition and sentencing), and from activities to cost objects (the boroughs of Manhattan, Brooklyn, Queens, Bronx and Staten Island).

The financial-resources-allocation block show the primary costs associated with managing the average daily population that can occur in a city, state or federal correctional system. These variable costs typically include wages and salaries, training, housing, utilities, medical, transportation, food and equipment supplies. Capital costs that may be budgeted over multiple years are not included here. Financial resources flow to the various activities, processes or sub-processes that we described in Figure 3.

Each process, including sub-processes, form a cluster of unique activities pertaining to that process that are linked in a sequential manner as shown in Figure 2.

Table 7: Distribution of Jail Admissions by NYC Boroughs 2016

Borough	**Percent***
(Cost Object)	
Manhattan	33.00%
Brooklyn	24.00%
Bronx	19.00%
Queens	19.00%
Staten Island	3.00%

Source: (NYC Mayor's Office of Criminal Justice (2106b), p. 9). *May not add up due to rounding.

The cost objects block is shown at the bottom of Figure 4, but it can also be shown as the starting point to define activities in a decentralized system where each borough can be viewed as an individual cost center for strategic planning purposes. Each individual cost object can then be rolled up to form a centralized view. For example, as shown in Table 7, Manhattan and Brooklyn account for larger share of jail admission, followed equally by Queens and the Bronx boroughs. Staten Island accounts for the least number of jail admissions in NYC.

The Process View

The horizontal building blocks in the process view in our ABC model are cost drivers and performance measures. Costs drivers and performance measures can include financial as well as non-financial measures.

Cost Drivers

Cost drivers measure the effects of resources consumed or needed for ADP management. We discussed earlier some of the key metrics or cost drivers used in measuring the reduction in jail populations in New York City and that included the number of charges, the annual number of admissions, the average daily population (ADP) and the length of stay (LOS).

Cost drivers include the operating or variable input costs of running a jail system and can include expenses such as staff wages & salaries, training, utilities & telephone, material & equipment supplies, routine maintenance, inmate food, inmate medical expenses, inmate clothing & laundry and inmate transportation. These expenses are often used in the estimation total factor productivity (TFP) measurement.[3]

Performance Measures

Financial and operational performance measures define the way in which activities meet or exceed internal or external benchmarking standards, and it is often used to measure team effectiveness over time. Performance measures often differ by activities and the difference reflects the complexity of the activity. Financial performance measure show where costs can be reduced, the amount of money that could be saved and identify additional opportunities to save costs.

Operation performance measures using an ABC model provide a powerful behavioral incentive to continuously improve operations, while at the same time increasing the level of communication of an organization by making sure that everyone is on the same page. Operational performance measures would include the reduction in admissions; ADP (adults and adolescents); recidivism, that is the low, medium or high risk of repeating a crime and reincarcerated; security risk (the risk of harming self, staff or other inmates); and quality of life measures (security, jail conditions, access to medical and mental health services, community reentry programs) while behind bars.

ADP is often used as a performance measure when the goal is to minimize or reduce admissions over time while increasing public safety. Declining ADP over time means that jails are getting smaller, safer and the cost of operations should also be declining. When ADP is combined with operating costs such comparisons can be used to determine areas where improvements and cost controls are needed in a typical benchmarking procedure.

Table 8, Table 9 and Table 10 based on data from (United States Government Accountability Office (2016), pp. 41-62), illustrate how ADP and operating costs can be combined to give different views of the data on prison operations and costs, depending on managerial needs. [4]

For example, Table 8 shows ADP and major operating costs categories for four districts in New York State (NYS) for Fiscal Year 2015. Guard's salaries are aggregated here for model illustration purposes only, but these expenditures can be broken by uniformed versus civilian employees and overtime pay, which may be substantial in certain cases.

The four NYS districts accounted for $59,252,326 (4.19%) in operating costs when compared to a grand total of $1,414,842,460 for all U.S. districts. The data reveal that while the Southern District of New York had the highest ADP in New York State, the Western District has the highest operating costs due to housing and medical expenses. The story is the same when we look at the comparative prisoner operating cost per ADP in Table 9 and Table 10 where labor and medical expense have the largest shares of operating costs in the Southern District of New York.

The Northern, Southern and Western New York districts were all above the average cost of labor (guards' compensation] when compared to the overall average of $856. Housing, medical and transportation operating expenses were all below average operating cost when compared to the overall U.S. totals.

Figure 4: ABC Model in Correctional Practice

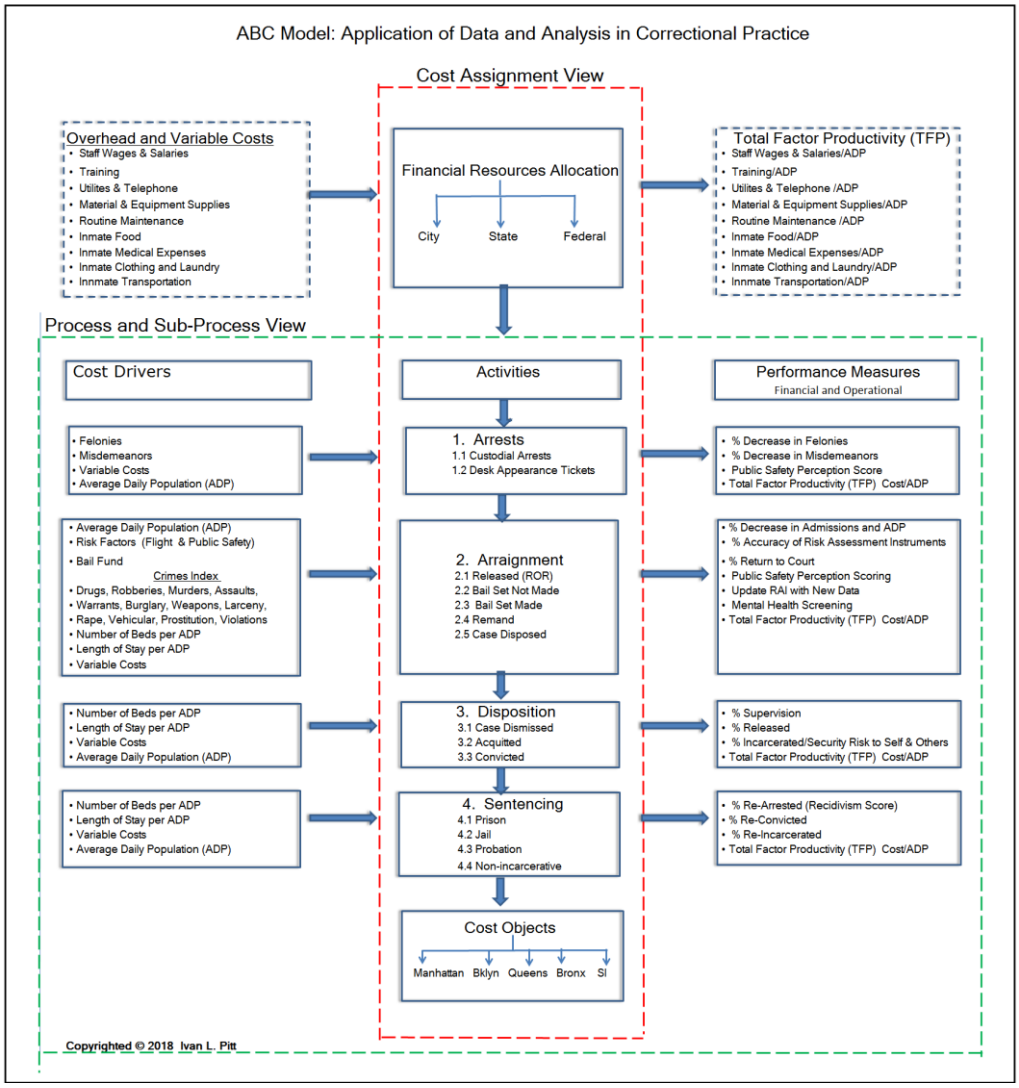


Table 8: U.S. Marshalls Service ADP and Selected Resource Costs By N.Y. Districts FY2015

District	ADP	Guards [1]	Housing	Medical	Transporta-tion	Total
(Cost Object)						
Eastern NY	933	$710,882	$11,237,819	$316,244	$609,010	$12,873,955
Northern NY	265	$326,771	$9,408,883	$463,497	$292,219	$10,491,370
Southern NY	1,499	$1,601,684	$12,004,911	$2,941,164	$23,789	$16,571,548
Western NY	480	$808,155	$16,968,137	$925,291	$613,870	$19,315,453
Sub-To-tal NY	3,177	$3,447,492	$49,619,750	$4,646,196	$1,538,888	$59,252,326
Total All Districts	51,670	$44,211,250	$1,202,240,462	$114,977,694	$53,413,054	$1,414,842,460

Source: Based on data from:(United States Government Accountability Office (2016), pp. 41-62.

1. Prison guard costs include private, local and district security facilities.

Table 9: Selected Costs per ADP By N.Y. Districts FY2015

District	ADP	Guards	Housing	Medical	Transportation	Total
(Cost Object)						
Eastern NY	933	$762	$12,045	$339	$653	$13,798
Northern NY	265	$1,233	$35,505	$1,749	$1,103	$39,590
Southern NY	1,499	$1,069	$8,009	$1,962	$16	$11,055
Western NY	480	$1,684	$35,350	$1,928	$1,279	$40,241
Sub-Total NY	3,177	$1,085	$15,618	$1,462	$484	$18,650
Total All Districts	51,670	$856	$23,268	$2,225	$1,034	$27,382

Table 10: Percent Share of ADP and Selected Costs by N.Y. Districts FY2015

District	ADP	Guards [1]	Housing	Medical	Transportation	Total
(Cost Object)						
Eastern NY	1.81%	1.61%	0.93%	0.28%	1.14%	0.91%
Northern NY	0.51%	0.74%	0.78%	0.40%	0.55%	0.74%
Southern NY	2.90%	3.62%	1.00%	2.56%	0.04%	1.17%
Western NY	0.93%	1.83%	1.41%	0.80%	1.15%	1.37%
Sub-Total NY	6.15%	7.80%	4.13%	4.04%	2.88%	4.19%

Although, it is not shown in the ABC model presented here, ADP performance measures can be further broken down into percentages of inmates who are known gang members; the use of force with or without deaths by officers; jail-based arrests of inmates for injuries to staff and other inmates; drug and weapons charges following routine searches; escapes, and participation and graduation rates for inmates in vocational training.

Housing performance can be measured by beds or cells available or unavailable due to repairs and capacity utilization.

Medical performance indicators can include the percentage of inmates diagnosed with mental or other serious medical issues; clinic visits; suicides; unnatural deaths and medical treatments.

Transportation performance indicators can include accidents and collisions per ADP during inmate transportation to and from court appearances, and the on-time arrival for court appearances.

CONCLUSIONS

The ABC model shown here promotes the use of financial and statistical data insights at all levels in an organization and that can include the daily and long-term strategic management of a correctional facility's operations. The data can be visualized or communicated in a two-dimensional (cost assignment and process view) format for process analysis, program evaluation, time-based accounting, performance monitoring, standardized analytics, internal and external research, and identifying gaps for future data collection.

The ABC model—as a tool for managing the complexity of correctional practice — showed where ADP costs can be reduced or dollars saved, and identified additional opportunities to improve performance measures in order to increase efficiency and productivity. By linking financial resources to jail (prison) activities and to cost objects, comparisons using costs drivers and performance measures can be made across different institutions, boroughs or states. The key is to isolate the costs and the directly related activities in a process flow that we outlined.

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However, like most models, the ABC model has its limitations and not every cost driver, activity or performance measure could be listed. The ABC model presented here may not address all issues such as private (profit motive) versus public prisons, and the quality of confinement such as security levels, capacity, geographic locations, social programs, medical conditions of prisoners and the age of facilities. All of these factors can contribute to higher operating costs (Perrone and Pratt 2003).

Second, there are other challenges to the implementation of ABC models in public sector organizations. Some costs cannot be directly assigned to activities; indirect costs may be hidden; unfunded financial liability costs may not get included, the cost of implementation may be high; entrenched management, employees and departments may be resistant to change; lack of top management support; lack of knowledge of ABC theory; problems in defining cost drivers, activities and accurate performance measures; and higher priority projects may take precedence (Oseifuah 2014).

NOTES

[1] An earlier draft of this paper was presented to New YorkCity Department of Corrections on September 21, 2021.

[2] Pitt (2019a) provides one method that can be used for modeling risk and to test the accuracuy of of risk assessment instruments.

[3] TFP estimation using a cost function (RVCF) is discussed in Norsworthy and Jang (1992) and Pitt and Norsworthy (1999).

[4] NYC data were not available at the time of writing.

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