Expired Medicines, How To Avoid Their Financial Losses

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The objective of this business report is briefly introduced is to demonstrate how to me can solve the problem of **Expired medicines in the USA, how to avoid their financial losses**

I believe that I have a better solution to face expired drug in USA pharmacy market and hospital.

The problem:

Pharmacies and hospitals, the pile of expired drugs they are required to toss out add up to about **$200,000 per hospital** each year.

When you count the costs of expired medications that thrown away by pharmacies and consumers, at least **$1 billion worth of drugs destroyed each year**.

There's a lot of waste in any hospital system," noted Dr. Robert Pedowitz, DO, medical director of the Family Practice of CentraState in New Jersey. "From multi-use bottles used once and packages that are never opened, there's so much we waste on a daily basis based on the expiration date and not because we know that it's definitely not still good."

https://www.healthline.com/health-news/your-prescription-expiration-date-might-be-inaccurate#1

Background information:

What Does Expiration Date Mean?

The expiration date, required by law in the United States, beginning in 1979, indicated the date the manufacturer guarantees the full potency and safety of the drug. At the time of the medication expiry date, the drug must be at least 90% of the original potency under proper storage conditions.

https://www.emedexpert.com/tips/expired-meds.shtml

The environmental side effects of medication:

Effect of drug disposal and environmental destruction.
Drugs flushed into the environment could be cause of wildlife decline.
https://www.theguardian.com/environment/2014/oct/13/drugs-flushed-into-the-environment-could-be-cause-of-wildlife-decline

Contaminants in the American Water Supply.
Improperly discarded prescription medications are a growing threat to America's water supply. In South Carolina, **128 million prescriptions filled every year**, and about **40 percent** of them result in unneeded medicine thrown away

Antibiotic-resistant bacteria already cause about **65,000 deaths per year**, and that number could rise if proper medication disposal techniques are not followed well and safe.

https://www.commdiginews.com/environment/the-cause-effect-drugs-environmental-destruction-32959/

The drug residues detected in water supplies generally flushed into sewers and waterways through human excretion. Many of the pharmaceuticals known to slip through sewage and drinking water treatment plants.

That is up from **41 million people** reported by the **AP** in March as part of an investigation into the presence of pharmaceuticals in the **nation's waterways**.

www.nbcnews.com/id/26662637/ns/health-health_care/Vmillion-us-have-drugs-drinking-water/#.XXvhkigzaUk

In what described as the first large-scale study of the occurrence of hormones and pharmaceuticals in untreated groundwater aquifers, USGS researcher's analyzed samples for **21 different hormones and 103 pharmaceuticals at 1,091 sites** around the United States

https://www.healthline.com/health-news/heres-the-drugs-that-can-show-up-in-drinking-water

https://link.springer.com/article/10.1007/s40572-014-0015-y

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1299201/

Report: U.S. drinking water widely contaminated with 'forever chemicals'

The contamination of U.S. drinking water with **man-made "forever chemicals"** is far worse than previously estimated with some of the highest levels found in Miami, Philadelphia and New Orleans,

https://www.cnbc.com/2020/01/22/us-drinking-water-widely-contaminated-with-forever-chemicals-report.html

https://www.stltoday.com/news/local/metro/report-u-s-drinking-water-widely-contaminated-with-forever-chemicals/article_45384354-50ee-5f20-8ef3-e3dc113c152a.html

<u>Drugs Expiration dates how costing patients:</u>

The US spends more per capita on medication than anywhere else in the world.

Health care spending in the United States is high and continues to increase, as does the spending for prescription drugs in particular. **In 2016, the U.S. spent $3,337 billion**, or **17.9 percent of the gross domestic product (GDP),** on national health expenditures, of which **$329 billion spent on prescription drugs**

https://www.actuary.org/content/prescription-drug-spending-us-health-care-system

Do you know that the United States imported every year drug **US$72.8 billion (18.2% of imported prescription drugs/medicines)**

http://www.worldstopexports.com/international-markets-for-imported-drugs-by-country/

Medication non-adherence (MNA).

U.S. health insurance system for people over the age of 65. Even accounting for rebates, spending by Medicare beneficiaries for **brand-name drugs rose 62% between 2011 and 2015. Most of those over the age of 65 did not receive 62% more salary** or pension over that period, so the steep rise in prices is causing people real pain

A recent Consumer Reports survey found that a third of Americans taking medication was hit with an increase in prescription **drug costs between March 2015 and March 2016, with most of them paying $63 more per refill**

According to National Health Expenditure data, the US spent **$333 billion in 2017**, up from **$236 billion** in **2007 (an increase of more than 40 percent).**

Among hypertensive patients, **89,000 premature deaths** could be avoid each year with appropriate medication treatment.

Common behaviors include:
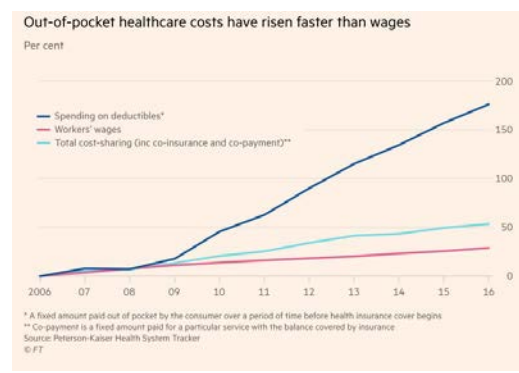One in 2 people missed a dose
One in 4 did not get a refill on time

https://www.marketwatch.com/story/why-do-americans-pay-more-for-drugs-2019-04-24
https://www.pillsy.com/articles/medication-adherence-stats

Nearly 1 in 4 Americans Taking Prescription Drugs Say it is Difficult to Afford Their Medicines, including Larger Shares among Those with Health Issues, with Low Incomes and Nearing Medicare Age

https://www.kff.org/health-costs/press-release/poll-nearly-1-in-4-americans-taking-prescription-drugs-say-its-difficult-to-afford-medicines-including-larger-shares-with-low-incomes/

Out-of-pocket healthcare costs have risen faster than wages
Per cent

— Spending on deductibles*
— Workers' wages
— Total cost-sharing (inc co-insurance and co-payment)**

* A fixed amount paid out of pocket by the consumer over a period of time before health insurance cover begins
** Co-payment is a fixed amount paid for a particular service with the balance covered by insurance
Source: Peterson-Kaiser Health System Tracker
© FT

Expired Costs:

Expired Drug per All U.S. Hospitals

Total Number of All U.S. Hospitals is **6210**
Expired Drug per hospital **$200,000**
Total financial losses =6210 *$200,000 =~**$ 1,242,000,000**

Expired Drug per All U.S. Pharmacies

Total Number of All U.S. Pharmacies is **~ 70,000**
Expired Drug per hospital =?
Total financial losses =70,000 *$? =~**$ 1,000,000,000**

https://www.aha.org/statistics/fast-facts-us-hospitals
https://www.ft.com/content/e92dbf94-d9a2-11e9-8f9b-77216ebe1f17

The financial burden on distribution companies to collect expired medicines from pharmacies and return them to pharmaceutical companies   **$ unknown?**

The Financial burden on pharmaceutical companies to get rid of those drugs through incinerators or Chemical treatment **$ unknown?**

What does the United States government do to prevent the side effects of the medication?

Congress Access to Increased Drug Disposal (AIDD) Act

Last fall, Congress passed the "**Access to Increased Drug Disposal (AIDD)**" Act as part of a larger package of bills aimed at controlling the national opioid epidemic. **AIDD** allows states to compete for **$10 million** in federal grants designed to increase participation in safe medication disposal programs.

https://www.statnews.com/pharmalot/2016/05/03/drug-take-back/

Local governments in-state "take-back programs"

Take-back programs estimated to cost about **one cent** for every **$10** in sales
In Alameda County, Calif., which launched the first take-back ordinance last year and has become a model for other local governments, officials have estimated the cost at roughly **$330,000 a year** on product **sales of $930 million** (although a pharmaceutical industry trade group pegged the price higher, saying it could reach **$1.2 million annually**).

https://www.statnews.com/pharmalot/2016/05/03/drug-take-back/

Asked (FDA) Shelf Life Extension Program (SLEP)

An official with the **Department of Defense**, which maintains about **$13.6 billion worth of drugs** in its stockpile, says that in **2016** it cost **$3.1 million** to run the extension program — which saved the department from replacing **$2.1 billion** in expired drugs. To put the magnitude of that return on investment into everyday terms: It is like spending a dollar to **save $677**

https://www.npr.org/sections/health-shots/2017/07/14/537257884/that-drug-expiration-date-may-be-more-myth-than-fact?live=1?live=1

However, is the US United States government solution safe? In addition, why US people need to consume the expired drugs.

https://www.emedexpert.com/tips/expired-meds.shtml

JOURNAL OF PHARMACEUTICAL SCIENCES, VOL. 95, NO. 7, JULY 2006

Could fresh water become scarce in the U.S.?

America consumes more water per person than any other country. Worldwide consumption is up, too, prompting concerns for the future.

And if the contamination of U.S. drinking water with man-made still in that high level
I think the USA government must act fast

https://www.bbc.com/future/article/20170412-is-the-world-running-out-of-fresh-water
http://facethefactsusa.org/facts/could-fresh-water-become-scarce-us/

The solution to the Problem:

My solution is to minimize the Expiration using Predictable formula and historical usage statistics
And using machine learning

"We using Predictable formula and historical data for product consumes to predict when our product will reach zero balance in inventory and we compare the expire date we generated   from our formula to the actually expired date written in our product
In that point, we will have the market status for our product to show two way a good or bad status
When customers get bad status in its product, they will have the chance to contact other pharmacies with good status to exchange the product with them
However, my dream that system we build to be centralized connects pharmacies and hospitals
In addition, that system shows good status and bad status for a product we can move the product from the area in the pharmacy with a bad status to another area with a pharmacy with good status"

My idea and project, I already submitted it before to **Microsoft Azure AI Hackathon** few-month age 10-July -10-September2019
placed in first "won Participation **(the First 50 eligible submissions)** in Microsoft Azure AI Hackathon! "
Moreover, it placed in first "10" Azure Machine learning from almost **1000 Participation around the world**
Link to that project I submitted to Microsoft Azure AI Hackathon
https://azureai.devpost.com/
https://devpost.com/software/product-in-markets-status

In addition, I join **"IBM Digital - Nation Competition** "It is a local competition in Egypt
However, my project place in six projects in the closing ceremony of **IBM Digital - Nation Competition Egypt**
https://www.linkedin.com/posts/sabineholl_ibm-developers-skills-activity-6594938995132719104-PJM8
https://www.linkedin.com/posts/omarreda291_ibm-digitalnationafrica-competition-activity-6595038344034435072-c_5y
https://www.linkedin.com/posts/information-technology-institute-iti-_ibm-iti-mcit-activity-6594175420088754176-XrFj

Also, my idea and project has GitHub licensed repository

https://github.com/abdelrazekrizk/MARKET-STATUS
https://github.com/abdelrazekrizk/USCARE
https://github.com/abdelrazekrizk/predict-the-end-of-the-expiration
https://github.com/abdelrazekrizk/Product-in-markets-status

Solution Costs:

The cost of host my application in any cloud database and that cost will be cover by Pharmacies and Hospitals subscribe to my application.

Moreover, that cost is nothing if we compare the cost of fixing the American water environment

Conclusion:

I think that my project will run jobs in the USA and save money and help the environment
I know that my project Minimize the Expiration will help our environment.
As Expired, medicine is about **2% of total medicine production worldwide and in the USA especially**
Moreover, The Myth of Drugs Expiration Dates is a global impact

Moreover, I think that I have to convince an environmental organization in my idea first and if I do that, they can drive IT company to obtain my idea

I hope that my idea can by real

To a better world where the poor have their food and medicine

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