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ETL and Data Warehousing

What is ETL

ETL is abbreviated for Extract, Transform and Load. ETL is a process that extracts the data from different source systems, then transforms the data and finally loads the data into the Data Warehouse system. ETL is a recurring activity (daily, weekly, monthly) of a Data warehouse system and needs to be agile, automated, and well documented.

Why ETL

ETL helps providing a common and consistent data repository to analyze their business data for taking critical business decisions. Transactional databases cannot answer complex business questions that can be answered by ETL. It helps improving productivity because it codifies and reuses without a need for technical skills every time.

ETL as a 3 Steps ProcessETL

ETL Process
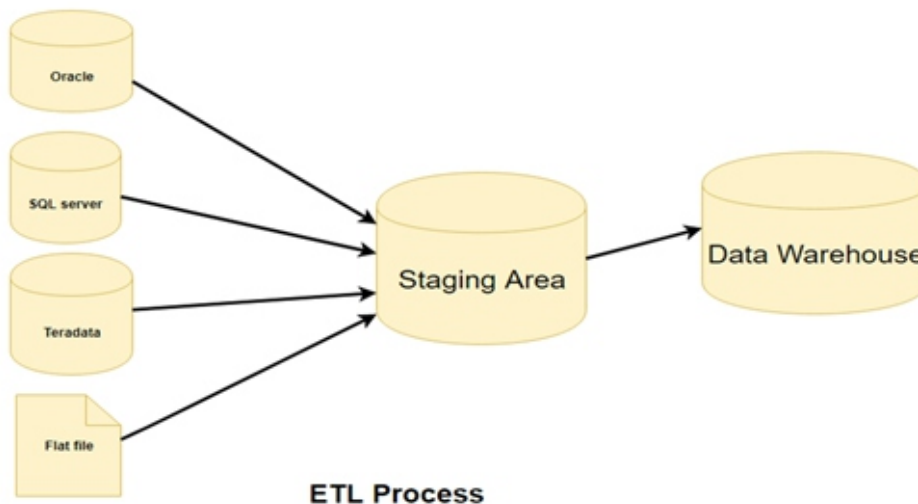
Extraction - Data is extracted from online transaction processing (OLTP) databases, commonly known as 'transactional databases', and other data sources. Sources could include legacy applications like Mainframes, customized applications, Point of contact devices like ATM, Call switches, text files, spreadsheets, ERP, data from vendors, partners amongst others.

Transformation - Data extracted from source server is raw and not usable in its original form. Therefore, it needs to be cleansed, mapped, transformed and validated against business rules. In fact, this is the key step where ETL process adds value and changes data such that insightful BI reports can be generated. This process is done in staging area so that source remain non-impacted.

ETL Tools

ETL tools come with a number of functions to facilitate the ETL workflow. With the growing popularity of the ETL tools, the data warehousing market has seen the emergence of several commercial and open source ETL tools like below listed:

- Informatica PowerCenter
- Business Objects Data Integrator
- IBM InfoSphere DataStage
- Microsoft SQL Server Integration Services
- Oracle Warehouse Builder / Data Integrator
- Pentaho Data Integration (Open Source)
- Jasper ETL (Open Source)

Characteristics of Data Warehouse

- **Subject-oriented**. They can analyze data about a particular subject or functional area.
- **Integrated**. Data warehouses create consistency among different data types from disparate sources.
- **Nonvolatile**. Once data is in a data warehouse, it's stable and doesn't change.
- **Time-variant**. Data warehouse analysis looks at change over time.

Main Capabilities of DW and Business Values

- Predicting future performance (data mining) - Develops visualizations and forward-looking business intelligence
- Tactical analysis (spatial, statistics) - Offers "what-if" scenarios to inform practical decisions based on more comprehensive analysis
- Stores Historical Data - Stores many months or years of data helping for business analytics.
- Slice and dice, ad hoc query, BI tools - Expands capabilities for deeper insights and more robust analysis

Future of ETL and Data Warehousing

Today's data warehouse is not what you think! It has capabilities that weren't imagined even just a few years ago. The data warehouse used to be accessed through SQL only and primarily by business users, but now also supports languages such as R, Java, Perl, Ruby, and Python running in parallel inside the database and used not only by business users but also by data scientists and application developers. The data warehouse will become an integrated enterprise processing engine, fusing multi-structured data and analytics.

SkyDrive Japan's Flying Car start-up successfully carries out Test Flight

The decades-old dream of hovering around in the sky as simply as driving on highways may be becoming reality. SkyDrive Japan's a flying car startup, has carried out a successful though modest test flight with driver on aboard.

The single-seat car, powered by a battery and four pairs of propellers, was lifted to six feet above the ground and hovered in a netted test area for about five minutes. Most significantly, the car had a pilot on board. The startup backed by Toyota aims to turn the prototype into a two-seater commercial model by 2023.

A flying car, or vertical take-off and landing vehicle, is different than an airplane or a helicopter in that it doesn't require a special takeoff and landing site and is designed to provide quick door-to-door transportation by both ground and air.

The SkyDrive car is about four meters long and two meters high, just small enough to fit into two average parking spaces and ideal for urban use.

In developed countries, flying cars are expected to be used as a means of transportation to ease traffic jams and respond in times of disaster, while in developing countries they are likely to be used as a form of transportation that requires far less infrastructure.

According to news right now, the SkyDrive model can fly for only five to ten minutes at a low speed of few miles per hour. The next step is to raise its speed up to 60 km per hour and extend flight duration to 30 minutes.

Google Duo Video Calls to Be Soon available on your Android TV

Google Duo will be coming soon to Android TV in beta, in the form of a native app. With this, you'll be able to directly initiate video calls from your TV via Google Duo. Earlier this month, Google had added support for Chromecast on Google Meet. The search giant seems to be aiming to increase the efficiency of its video calling apps, with people relying on virtual methods to connect more than ever.

Google revealed the feature in a blog post, saying that the big screen wasn't just for work meetings, and it aimed to make video calling family and friends better, too. Google Duo on Android TV will allow you to initiate one-on-one and group calls directly from your TV. If your TV doesn't have a built-in camera, you can plug in a USB camera for the purpose of the video calls.

Noting that 2020 may go down as the year of the video call, TJ Varghese, Google Meet hardware's Group Product Manager, wrote on the blog that video calls have become an indispensable tool, one that we are all probably using more often than we would have imagined. This could, however, give rise to meeting fatigue, he said, and using the right devices could make a big difference in making video calls more enjoyable and engaging.

This move seems to be a part of Google's strategy to add more features to the video-calling bandwagon, enhancing the way people can connect and work during the pandemic. Google Meet had recently added Chromecast support, through which you can stream your lectures and meetings on the big screen. This feature will work with work with Chromecast, Chromecast Ultra, and second-generation Chromecast devices as well. Google had also launched Meet on Nest Hub Max a few months ago.

The search giant has reportedly been planning to replace Google Duo with Google Meet. G Suite head Javier Soltero had reportedly told employees that the coexistence of Duo and Meet, both video calling apps, doesn't make sense. A merger is reportedly being planned, internally referred to as 'Duet' (Duo + Meet.)

Amazon fitness band Halo will make the 3D model of body & tracks the emotions

Amazon on 27th August 2020 announced its entry into the fitness smartwatch market with a smart band called Halo and a subscription service by the same name. The e-commerce platform has launched the smart band with a lot of features that are unheard of. Apart from tracking the basic fitness activities, the app will also detect your tone and determine how positive you sound and also 3D scans your body fat.

Not just the features, the Halo band looks different from other smartwatches that are available in the market. Any smart band or watch that you pick up from the market will feature a screen but the Halo band does not have a screen. The Halo band and Halo service with all its unusual features will be available for a special price of $64.99 including 6 months of Halo membership.

Talking about Halo's features, Maulik Majmudar, Principal Medical Officer, Amazon Halo, said, "We are using Amazon's deep expertise in artificial intelligence and machine learning to offer customers a new way to discover, adopt, and maintain personalized wellness habits. Health is much more than just the number of steps you take in a day or how many hours you sleep. Amazon Halo combines the latest medical science, highly accurate data via the Halo Band sensors, and cutting-edge artificial intelligence to offer a more comprehensive approach to improving your health and wellness."

Although the Amazon Halo does not have a display like other smartwatches, it has sensors including the accelerometer, a temperature sensor, a heart rate monitor, two microphones, an LED indicator light, and a button to turn the microphones on or off, among other functions.

Amazon with its smartwatch not only wants to let people know about the number of steps they have taken in a day but also aims to take care of the user's physical and emotional well beings. Its one of the most talked-about features is the Tone feature. "The innovative Tone feature uses machine learning to analyze energy and positivity in a customer's voice so they can better understand how they may sound to others, helping improve their communication and relationships," Amazon said in a blog.

Apart from that, the Halo band will monitor your body weight using a machine learning tool. Users can measure their body fat percentage at home and the company claims that the results are accurate and more reliable than the home scales.

About the privacy and security bit, Amazon has said that "multiple layers of privacy and security are built into the service to keep data safe and in customers' control." Users can download or delete their data at any time directly from the app.

Eufy a Hybrid Robot Vacuum-Mop launched in India by Anker Robovac

I t is a smart robotic vacuum cleaner with Wi-Fi connectivity, compatibility with Google Assistant and Amazon Alexa for voice commands, and app-based controls. The new affordable robotic vacuum cleaner comes with an additional mop function. Both functions can be carried out simultaneously.

The Robovac G10 Hybrid features smart dynamic navigation and can be controlled using the Eufy-Home app. This lets users start, stop, and schedule cleaning jobs, remote control the robot for manual cleaning, provides maintenance alerts, and more. The vacuum cleaner has a rated power of 2000pa for suction. It also provides voice prompts to alert users of its ongoing tasks.

It's also possible to link the Robovac G10 Hybrid with Google Assistant and Amazon Alexa This would allow users to control the robot through voice commands on compatible devices such as smart speakers and smartphones. Wi-Fi connectivity allows the Robovac G10 Hybrid to work with the app and voice assistants. The cleaner's mop fittings and water tank allow it to mop while vacuuming.

Google studied historical accelerometer readings during earthquakes

Alphabet's Google's Android phones on Tuesday started detecting earthquakes around the world to provide data that could eventually give billions of people precious seconds of warning of a tremor nearby, with an alerting feature first started in California.

Japan, Mexico, and California already use land-based sensors to generate warnings, aiming to cut injuries and property damage by giving people further away from the epicenter of an earthquake seconds to protect themselves before the shaking starts.

If Google's approaches for detecting and alerting prove effective, warnings would reach more people and to other developing countries with few traditional sensors. Seismology experts consulted by Google said turning smartphones into mini-seismographs marked a major advancement, despite the inevitably of erroneous alerts from a work in progress, and the reliance on a private company's algorithms for public safety. More than 2.5 billion devices, including some tablets, run on Android operating system.

Accelerometers - sensors that measure direction and force of motion - are mainly used to determine whether a user is holding a phone in landscape or portrait mode. The company studied historical accelerometer readings during earthquakes and found they could give some users up to a minute of notice.

Android phones can currently separate earthquakes from vibrations caused by thunder or the device dropping only when the device is charging, stationary, and has user permission to share data with Google.

If phones detect an earthquake, they send their city-level location to Google, which can triangulate the epicenter and estimate the magnitude with as few as several hundred reports.

Google expects to issue its first alerts based on accelerometer readings next year. It also plans to feed alerts for free to businesses that want to automatically shut off elevators, gas lines, and other systems before the shaking starts.
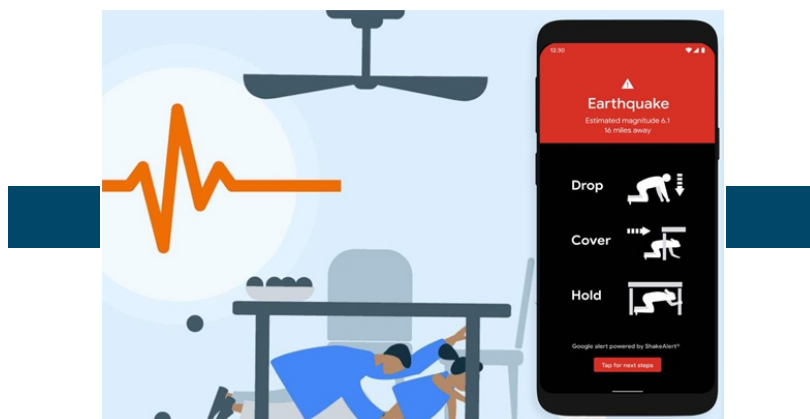
SpaceX Crew Dragon Capsule with NASA Astronauts Returns Safely to Earth

US astronauts, who flew to the International Space Station in SpaceX's new Crew Dragon, splashed down in the Gulf of Mexico after a two-month voyage that was NASA's first crewed mission from home soil in nine years.

The crew's retrieval from Crew Dragon was delayed slightly as the teams worked to flush its fuel tanks after sensing traces of nitrogen tetroxide fumes outside the capsule, a toxic gas from one the spacecraft's flammable fuels.

For the return sequence, on-board thrusters and two sets of parachutes worked autonomously to slow the acorn-shaped capsule, bringing US astronauts Bob Behnken and Doug Hurley speed of 17,500 miles per hour in orbit down to 350 mph upon atmospheric re-entry, and eventually 15 mph at splash-down.

NASA, aiming to galvanise a commercial space marketplace, awarded nearly $8 billion (roughly Rs. 59,985 crores) to SpaceX and Boeing collectively in 2014 to develop space capsules, experimenting with a contract model that allows the space agency to buy astronaut seats from the two companies.

Elon Musk's SpaceX became the first private company to send humans to orbit with the launch of Behnken and Hurley.

'BlackRock' Android Trojan Malware can Steal confidential Banking information

The BlackRock malware is based on the leaked source code of another malware strain called Xerxes. However, unlike what it's based on, BlackRock has been upgraded with features that can steal credit card credentials and passwords. The country's cyber security agency has issued an alert against an Android malware dubbed "BlackRock", that has the potential to "steal" banking and other confidential data of a user. It can extract credentials and credit card information from over 300 apps such as email, e-commerce apps, social media apps, besides banking and financial apps, the CERT-In said.

According to computer emergency response team of India the "attack campaign" of this 'Trojan' category malware is active globally.

Some suggestion to prevent your device from this malware are to do not download and install applications from untrusted sources and use reputed application market only; always review the app details, number of downloads, user reviews and check "additional information" section before downloading an app from play store, use device encryption or encrypt external SD card; avoid using unsecured, unknown Wi-Fi networks among others.

Also, when it comes to downloading banking apps one should use the official and verified version and users should make sure they have a strong AI-powered mobile anti-virus installed to detect and block this kind of tricky malware.
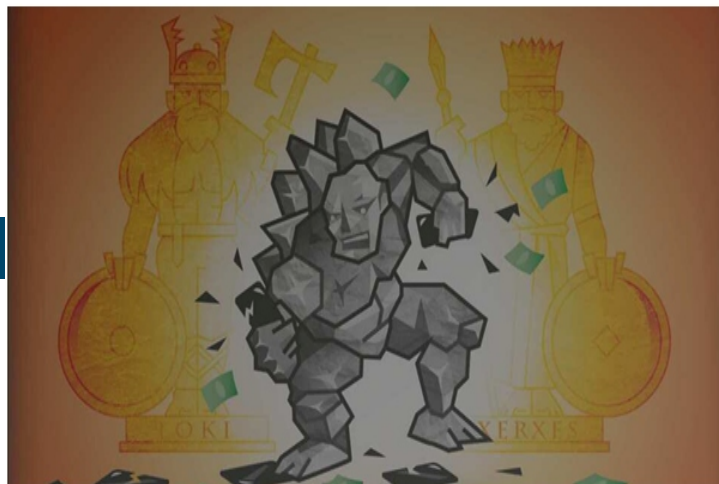
Bengaluru-based startup developing air-launched drones with US Air Force Research labs

The project would be one of the first success stories for the intergovernmental DTTI that has yet to show significant results, despite intense efforts by both India and US.

Bangalore based startup is part of the first Indo-US technology collaboration project in the aerospace sector and will work with the US Air Force Research labs to develop future air launched drones for the armed forces.

NewSpace Research and Technologies Pvt Ltd, a start-up that lists itself as a 46 member team, is part of a project selected under the Indo-US Defence Technology and Trade Initiative (DTTI) to do-develop air launched unmanned aerial vehicles, ET has learnt. While the company did not offer comments when contacted by ET, it is learnt that it has been selected for a futuristic program that involves collaboration with the US Air Force Research Labs, the Indian Air Force and the Defence Research and Development Organisation (DRDO).

Details of the project have not been shared yet but is likely to involve drones that act as force multipliers for combat aircraft on mission. The project would be one of the first success stories for the intergovernmental DTTI that has yet to show significant results, despite intense efforts by both India and US.

At a seminar last month, top Pentagon official Ellen M Lord, Under Secretary of Defence for Acquisition and Sustainment had referred to the air launched drones program but had not mentioned the name of the Indian start-up being involved.

Experts have welcomed the move to involve the private sector in the Indo-US technology sharing initiative. "A lot of the work under DTTI isn't terribly advanced, certainly not the kind that requires high-level enabling S&T research from organisations like DRDO and DARPA. Given that, it makes sense to involve private businesses, particularly the more agile and specialised outfits, to collaborate on meeting high level requirements set out by the militaries of both sides," aviation expert Angad Singh with the Observer Research Foundation (ORF) says.

He adds that projects like these need to focus on development of technology and not be treated as an arms sale. "The key thing is to frame DTTI as cooperative tech development -- where both sides contribute and both benefit from the outcomes -- rather than one-sided arms sales or technology transfer from the USA to India," Singh said.

While the US side seems to be keen to work with Indian companies and start ups, as is clear from the selection for the first aviation project, it remains to be seen how things go ahead, given that traditionally such initiatives have been driven by the DRDO that is bound to a set governmental procedure and pace.

IT services will continue to be an attractive job market: TCS CEO

The IT services sector will remain an attractive Job market for India's young workforce and the demand for talent will only increase due to stepped up technological innovactions going forward, said Rajesh Gopinathan, CEO of Tata Consultancy Services, India's largest technology services company.

Technology companies impacted by the Covid-19 pandemic over the last few months have chosen to save costs by freezing hiring and laying off employees, posing a challenge to fresh graduates seeking jobs. Companies including Cognizant, IBM and Accenture have and are likely to lay off thousands of technology professionals across the country.

However, Indian IT services companies like TCS, Infosys and HCL Technologies have said that they would honour commitments and hire a combined 100,000 professionals in the current year.

TCS had said that it would hire 40,000 freshers from Indian campuses similar to last year's levels.

"In absolute terms, Indian IT's employment potential will continue to be quite strong and will relatively keep growing in pace with where we see the opportunity," Gopinathan said at a webinar organised by professional networking site LinkedIn.

"Into the foreseeable future, IT services will remain very attractive and a significant part of the job environment in India because I believe that the demand for talent and the demand for these services is only going to explode given the role that technology is playing today and in the future," he added.

Young executives will not lose jobs due to automation of functions across industries because they are native to new technologies; however, older professionals should embrace new skills, he said.

"My bigger message is to those who have more experience, 10-15 years' experience, they also need to embrace it (new skills) rather than being worried about it. They need to invest in contextual knowledge and upgrade their skills in terms of tool usage," Gopinathan said. TCS is on the path to revenue and margin recovery that it forecast at the beginning of the Covid-19 pandemic, he added. "We expect that we will recover on the revenue front by the end of Q3 and we should be able to recover to where we were on the margin side by the end of Q4. We are seeing that in the way things are panning out in this quarter also. Standing at the middle of the quarter, I am quite confident that the trajectory we laid out, we are holding steady on that," said Gopinathan.

Europe will remain an attractive market for the company and will outperform other regions from a growth perspective, he said. S&P Global Ratings on Tuesday revised its outlook on TCS to 'stable' from 'positive'.

Department of Computer Applications (MCA)

Need framework to tackle digital payment frauds: DSCI-PayPal India report

The report has highlighted various emerging and existing fraud risk scenarios relating to digital payments and the approaches Indian regulators, policymakers, and consumers can take to mitigate them. The growing adoption of digital payments in the country, especially during the Covid-19 pandemic, has necessitated the need for a comprehensive framework to tackle cybersecurity risks involving digital transactions, according to a joint report by the Data Security Council of India (DSCI) and payPal India.

The report has highlighted various emerging and existing fraud risk scenarios relating to digital payments and the approaches Indian regulators, policy makers and consumers can take to mitigate them. Rajesh Pant, national cyber security coordinator, and K Rajaraman, additional secretary, department of Economic Affairs launched the report on Wednesday in a virtual event. "The government is already working closely with the Industry, and Covid-19 has proved to be an accelerator (of this process)," said Rama Vedashree, CEO of DSCI, at the launch event.

"In order to find the right balance between enablement and protection, it is critical that a collaborative effort be undertaken by all stakeholders involved, to establish a comprehensive fraud management framework for digital payments in India," she added.

The report identified lack of awareness among first users of internet and digital payments as a key area of concern. While the growth of online shoppers is 73% for tier-I cities against 400% growth in tier-II and tier-III cities, the ecommerce market is expected to grow to $200 billion by 2026 from $50 billion in 2018, the report stated.

"While we have witnessed a tremendous shift in commerce and financial services, there has been an increase in cyberattacks and the global pandemic has revealed gaps in business continuity plans and IT operations," said Steven Chan, senior director, head of government relations, APAC, PayPal.

"Therefore, developing the right solutions will be essential to enhancing small business resiliency and the recovery of the overall economy," Chan said at the launch.

The report makes several recommendations to regulators and policymakers on how the cybersecurity framework can be strengthened, including use of technologies such as geolocation, machine learning and threat modelling to detect frauds.

Mumbai stress levels at peak, Chennai least: Study

It was much higher than the rest of the country that recorded an increase of 37%.Bengaluru, NCR and Chennai recorded 37%, 35% and 23% respectively. A mental health study done on 8,396 Indians between April and June to capture stress levels of Indians during the lockdown has found that Mumbai was the most stressed - recording the highest net increase of 48% in stress levels.

It was much higher than the rest of the country that recorded an increase of 37%. Bengaluru, NCR and Chennai recorded 37%, 35% and 23% respectively. The study - Mental health implications of Covid and lockdown in India - was conducted by YourDost, an online mental health platform, that has reached out to two million Indians in the past five years. The study draws attention to the fact that the onset of lockdown did have a major psychological impact in India with 65% people experiencing moderate to severe stress. The biggest trigger was the uncertainty of how long the pandemic would last.

The study recorded a 41% increase in anxiety in the participants and a 38% percent increase in anger and irritability during the lockdown period. And 6% dip in 'happiness'. Some 59% Indians reported being affected by a fall in work-life balance.

At the beginning of the lockdown, 33% of all respondents reported being highly stressed. By the end of June this figure had increased to 55.3%. Top stress point at the beginning of the lockdown was 'how long will the lockdown last' which, after three months of lockdown, became 'difficulty in maintaining work-life balance', 'postponement of exams' and 'paycut/job losses. Two in five Indian employees are facing pay cuts. "Team managers also reported high stress levels. They said they don't have the skill set to manage huge teams remotely and don't have the tools to measure output in such a situation," said Dr Jini K Gopinath, clinical psychologist and chief psychology officer at YourDost.

Students recorded the highest net increase in stress levels - 39% -followed by working professionals at 35%. As the lockdown progressed, students continued to be the worst hit emotionally, reporting highest net deterioration in their emotions, particularly in terms of anger, anxiety, and happiness.

Emotional outbursts due to lockdown notched up a 22% increase and sleep deteriorated by 11%. To survive, people adopted a number of coping mechanisms and speaking to friends and family on the phone was the most popular method to cope for students while reducing news consumption was the second most preferred way to beat stress for working professionals.