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**INTRODUCTION**

- **CubeMaster Online** is the world first and best cloud solution with the subscribers more than 8,200 as of 6/01/2018.

- It allows you to build optimal load plan for ULD, pallet and vehicles with single and mixed products through the intelligent loading and space utilization anytime, anywhere with any devices.

- We propose **CubeMaster Online** for your best choice of load planning and optimization solutions.
Many companies are shipping & delivering wasted spaces.

They waste so much time to calculate how many products can be loaded into containers and trucks.

They are unsure how many containers will be needed to ship multiple orders.

Logistics cost is higher than manufacturing’s in Supply Chain.

More companies are seeking cost saving solution in Logistics.
WHAT IS CUBEMASTER ONLINE?

- The world first and best cloud based load planning system.
- The present number of subscribers are 6,500 as of 7/01/2016.
- No software installation on your computer. Just access your web browser.
- Create a load plan in minutes and share it with your team.
- State-of-art user interfaces for loading trucks, trailers, sea containers, pallets and ULDs.
- Very powerful and sophisticated algorithm proven by hundreds of applications.
- Open APIs for integrating with customer’s legacy system such as ERP, WMS, TMS, OMS, SAP.

The world #1 cloud based load planning system.
WHAT CAN YOU DO WITH CUBEMASTER ONLINE?

- **Simplify**
  - Simplify the distribution of load plans to separate team members and customers by using the online service.

- **Enhance**
  - Enhance communication among departments and with customers by sharing centrally stored shipment data.

- **Use**
  - Use extensive stacking rules and configurations to minimize damage during transit.

- **Prepare**
  - Prepare optimal plan for multi-stops and priority loading.

- **Cut time**
  - Cut loading and unloading time with step-by-step load instructions and diagrams.

- **Guess**
  - Take the guess work out of load planning by having exact calculations prior to each shipment and minimize labor errors.

- **Cut cost**
  - Cut freight and fuel costs.

- **Optimize**
  - Optimize filling space and increase space utilization.

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CubeMaster provides proven software solutions to optimize loading patterns, improve utilization, reduce the use of transit vehicles and cut freight costs.

CubeMaster uses intelligent loading algorithms and extensive stacking rules to optimize loads.

It will place cargoes in the transit vehicles after taking into consideration the following questions:

- Should cargoes be placed on floor?
- Should cargoes be placed per order or stop off?
- Should cargoes be placed in a defined ratio?
- Should there be a maximum allowable layers or supporting weight?
- Should cargoes be floor loaded or in unitloads?
- Should cargoes have certain pattern when placed in unitloads?
- Should loose cargoes be placed on a mixed pallet?
- Should cargoes be stacked on another for stability and to minimize damage?
Implementing CubeMaster Online will reduce the cost of your logistics by:

- Increasing inbound and outbound load efficiency of 10~15%
- Reducing labor costs by 30%
- Reducing the palletizing and packaging costs by 4 to 10% depending on complexity of items
- Reducing shipping and transportation costs
- Increasing productivity in the packaging and loading process
OPTIMIZATION TYPES

Vehicle Load Optimization (VLO)
Pallet Load Optimization (PLO)
Carton Load Optimization (ACO)
Air Cargo Optimization (ACO)
VEHICLE LOAD OPTIMIZATION (VLO)

- CubeMaster VLO optimizes the loading of transport units such as trucks, trailers, railcars and sea container.
  - Minimizes the number of vehicles to fulfill the orders
  - Allocates orders to the proper vehicles with maximized load efficiency
- Various load types
  - Mix Load finds optimal number of vehicles to load all orders of different size cartons
  - Unit Load calculates optimal pattern type for full container loads of single-size product
  - Set Load calculates best qty of each cargo when several cargos should be kept to compose one product
  - Multi-Set Load finds optimal number of vehicles to load all orders of different size cartons with regarding multiple destinations and stops
VEHICLE LOAD OPTIMIZATION (VLO) - 2

Considers diverse loading rules
- Multiple cargo styles such as shipcase, palletload, unitload and roll
- Multiple vehicle types (e.g. 40FH x 2, 40FT x 3, 20FT x1)
- Stacking rules
- Grouping for same destinations or stops
- Load orientations and max/min layers
- Loading and unloading sequences

Useful tools for improving the filled containers
- Change the size of loaded container on the fly
- Spread the load on the floor
- Fill with additional cargoes
- Move loads between two containers
- Palletizing to a vehicle
  - Build full or partial pallets and mixed pallet loads before loading a vehicle by using the Palletizing options
  - CubeMaster will configure full, partial and mixed unitload and fill the vehicles with them automatically with maximum load efficiency
CubeMaster Online PPO calculates the loading of order picking pallets while considering numerous restrictions such as multiple pallet types, palletizing height and packing weight.

Pallet Types
- Wood, Steel, Paper, Flat, 2-Ways, 4-Ways
Pallet Optimization (PPO) – 2

- Palletizing Rules
  - Overhang
  - Multiple Loading Patterns
    - 1 Block, 2 Blocks, 3 Blocks, Pin-wheel, Interlock, Multi-surface
  - User Selectable Patterns

- Single & Mix Loaded Pallet
  - It fills pallet with single SKU type and multi SKU types as many as possible.

- Packaging Materials
  - You can add banding, wrapping, top & angle panel to palletizing
**AIR CARGO OPTIMIZATION (ACO) - 1**

- CubeMaster ACO optimizes the air freight cargo loading with diverse ULD and air-pallet types.

- **Vehicle Type**
  - ULD (Unit Load Device)
  - Air Pallet
  - User Defined Type
A ULD has following properties
- Name
- Exterior size and thickness
- Empty and max weight
- Empty and max price
- Max volume % allowed in the ULD
- Max number of cargoes allowed in the ULD
- Color
- A contour shape one of the right pictures.
- The shape can be modified with the Shape Editor.
A custom shape can be defined at the ULD Shape window by defining six points.
Three steps to build a loading plan of an air craft

Step 1: Defining an air craft
- Define various ULD shapes
- Assign ULD shapes to each air craft
- Air crafts are saved to the database

Step 2: Loading an air craft
- Choose an air craft from the database
- Define a shipment list to be placed in the air craft

Step 3: View the loading plan of the air craft
- View the loading diagrams of all ULDs in the air craft
- Create the loading reports including the loading instruction and step-by-step images
- Print the loading reports or send to email messages to the operating team
CONFIGURATION OF CUBEMASTER ONLINE

CubeMaster Online Servers
MS Windows Server 2012

GoDaddy.com at Arizona IDC, USA

Internet

Users
Windows 7, 8, 9, XP, VISTA
Mac, Android, iOS

Somewhere in the world

Database
- Orders
- Shipment
- Vehicles
- Cargoes

MS SQL Server 2012
CubeMaster Online is composed of the following components:

- Orders
- Shipment
- Vehicles
- Cargoes
- Grouping
- Stacking
- Palletizing
- Naming

CubeMaster Online is composed of the following components;
CubeMaster Online is composed of the following components:

- **Database**: The storages for the industry standards trucks, trailers, pallets, sea container, ULDs and user defined cargoes, rules and master data.

- **Five Views**: The main pages - Home, Simulation, Analysis, Reports & Database allow the users to access the system.

- **Data Interfaces**: HTML pages allow the users to upload shipment and master data to the database.

- **Calculation Engine**: An object to collect the load data and calculate a load plan.

- **Graphics Engine**: Renders the 2D/3D graphics of the load plans.

- **Business Objects**: A set of object to process the industry specific business algorithm.

- **Data Objects**: A set of objects integrate the database with the calculation engine and HTML pages.

- **Mobile Pages**: Special pages optimized for mobile screens.

- **Web Services**: A set of APIs for allowing the external application to integrate the system.
WORK PROCESS

- **Build a load plan** with uploading a shipment or entering orders at Simulation view. The calculation engine will calculate it automatically.
  - A new load plan is started at the Home > Today page.
  - Or existing load plan is opened at Home > Document Explorer page.

- **Analyze a load plan** with 3D graphics and analytic tools at Analysis view.

- **Change a load plan** - The load of each vehicle can be modified at Analysis > Load Editor page if the physical load for some reason doesn’t match the load plan.

- **Print or export reports** at Reports view.
  - 7 reports are created and ready for printing.
  - A load planner sends a loading instruction by email to other persons.
  - A PDF file is created with each report exported.

- **Save a load plan** into the load plan database for later opening.

- **Share a load plan** - Load plans are shared and published to other users and they see and open them at Home > Document Explorer page.

- **Manage the load plans** – All the load plans are deleted, shared or restored at Home > Document Explorer page.
Cargoes Database

Define your cargoes data in the built-in database so they will be available for you to load into ULDs.

The names, descriptions, dimensions, stacking requirements, loading orientation and placement, palletization preference and more are defined at the Cargo Properties window.

Just pressing the Save button stored all the changes to the Cargoes Database.
Databases - 2

- Containers Database
  - The industry standard containers for Truck, Trailers, Pallets, ULDs are created in the containers database at the time of the installation of CubeMaster program.
  - Not only they are modified at any time but also new sizes are added to the database.
**DATABASES - 3**

- **User Managements**
  - **Users Database**
    - An user has email, user name, password and role.
    - All users are stored and manages at Users Database.
    - A new user created.
    - An existing user deleted or modified.
    - A user is given one of pre-defined roles – Supervisor, Normal, Viewer.
  - **Usages History**
    - All login are stored at Usages Database.
  - **Mailing History**
    - All mails history are stored at Mailing Database.
Excel/CSV Import Wizard

For bring in the existing data in Excel or CSV files more seamlessly, use the Excel/CSV Import Wizard.

It allows CubeMaster to easily and accurately import cargo names, descriptions, dimensions, stacking requirements, loading orientation and placement, palletization preference and more from your Excel or CSV files.
- **New Load from XML**
  - CubeMaster will start a new load optimization automatically from the XML where the order and shipping information are defined in a one file. That XML file should include several tags for the list of containers and cargoes with order quantities for the new load.
  - This feature is quite convenient for the seamless integration with an external application if it is capable to create a XML file.
Great Looking User Interface

Our R&D team works hard to make CubeMaster Online not only look fancy but get organized.

It allows you to handle complex simulation data and navigate the load results in ease and simple way.
Inserting Your Logo to Your Program

- Define your company information including the logo and insert them on your program and reports.

Multiple Unit of Measure

- Switch on-the-fly between mm + kg, cm + kg and inch + lbs. All the sizes and weights of your load are converted automatically by the change.
Multiple Languages

Switch on-the-fly between different languages such as English, German, Spanish, Chinese, Japanese and Korean.
Synchronize with your foreign supplier or customer if each has CubeMaster. Just a click will switch between different languages.

Tab System

Helps reducing your error while creating the load plan with keyboard and mouse handling.

Program Settings in One Place

For easy and integrated configuration of the program settings.
Easy Load Setup

- **No Moves across the Different Windows** – Just stay there and make an easy and fast setup of the load calculations with a few clicks.

- **As Easy as Excel for Building Cargo List** – We developed hard for putting the same functionalities to the cargo list.

**USER INTERFACES — 4**
Easy Load Setup – Trucks/Sea Containers/Pallets/ULDs list

- **Multiple Containers types** – Build a set of multiple containers types to maximize the space utilizations of the mixed cargoes with different sizes and quantities.

- **Easy Add from Trucks/Sea Containers/Pallets/ULDs database** – Just one click of the database will add to the list.

- **Bestfit vs Your choice** – Each container type has max quantity and sequence to be filled.
Easy Load Setup – Cargo List

- Provides several options to build cargo list
  - Entering by manual editing
  - Bring cargoes database with searching
  - Uploading an Excel file
- The entries can be removed.
- An existing cargo can be changed with manual editing.

- Easy Access to Frequently Used Rules – The most frequently used rules are in front of you. No need to open a popup either move to a different window.
- Automatic loading of rules – Stacking and special handling codes are loaded from the database.
▪ **Smart Analyzing Tools**
  - Load Explorer window helps you to analyze the solutions easily.
  - Load List window shows the list of items with size, weight and volume % in a load.
  - Load Blocks window tells the position and size of all blocks in the container as well as the arrangement.
  - Graphics window shows the 3D diagrams of the filled container.
  - Empty spaces window shows the list of space left empty in a container.
Multiple Reports and Printouts

- Well Structured Load Summary - Display of the % cube, % weight and % cost of your transit vehicle.
- Color Coded Manifest – Enables the interactive showing or hiding the certain loads on 3D graphics.
Multiple Reports and Printouts - 2

• 3D Graphical Views – For load plans, step-by-step loading diagrams, empty spaces, placements list and comprehensive summary reports.

• 3D Weight Distribution Chart - With axle weight and center of gravity.
▪ **ULD Shape Editor**

▪ The air container and air pallet can be modified and customized for your special size and shape in addition to standard database.
### Mobile Pages
- Special pages display when CubeMaster Online is accessed by mobile devices.
- They are optimized for the mobile screen sizes such as iOS and Android tablets and smart phones.
The following reports are provided:

- **Load Summary** – Overview of the load plan
- **Solutions** – The list of ULDs filled
- **Loading Instruction** – Step by step instruction
- **Loading Diagram** – 2D and 3D graphics of the filled ULDs
- **Loading Request** – Load list for the warehouse pickups
- **Commercial Invoice** – Document for exporting and importing
- **Packing List** – Document for exporting and importing

All reports are printed and exported to a PDF file.
While CubeMaster Online provides a self-sufficient data model, integration with ERP/TMS/WMS can be done at an application level, using web services. Three types - Load Calculation, Database and Archive web service are available for your seamless integration of CubeMaster Online into your application.

For more information, please visit http://cubemaster.net/Subcription/integrations.html
Load Calculation Web Service
A set of APIs for your application such as ERP/WMS/TMS to send the shipment data to CubeMaster Online and get back the load plan.
With using the service, your application can calculate a load plan automatically and save to CubeMaster Online without the manual work.

Database Web Service
A set of APIs allowing your application to upload the master data to CubeMaster Online automatically without the manual works.
Using this service replaces and automate the manual works such as uploading an Excel sheet.

Archive Web Service
A set of APIs allowing your application to download the load plans from CubeMaster Online automatically.
WEB SERVICES - 3

- How the Calculation Web Service work

1. Send the shipment
2. The load plan uses the master database
3. The load plan saved to the database
4. Take a load plan

A load plan is calculated by the **Calculation Web Service**

Your system such as ERP, WMS, TMS, OMS

CubeMaster Online Server
(http://www.cubemaster.net)

Master Database

Documents Database

Calculation Engine

Data Objects

Load Plan

CubeMaster Online Server
(http://e3.cubemaster.net)

Load Plan

Shipment

1. Send the shipment
4. Take a load plan

APIs (Web Services Objects)
### WEB SERVICES - 3

- **Alternative way – Dropbox like.**

This service is available at the on-premise model.
WEB SERVICES - 4

- How the Calculation Web Service integrated to your app

Step 1: Importing WSDL to your development tools such as C++, C#, SAP, Java and build your custom app.

Step 2: Executing your app to fill the shipment class of the web service and send it to CubeMaster Online.

Step 3: Executing your app to access the load plan taken from the server with using the classes of the web service.

Step 4: Executing your app to store the load plan to your database or computer screen for your users.

CubeMaster Online Server (http://www.cubemaster.net)

1. Send the shipment

2. The load plan uses the master database

3. The load plan saved to the database

4. Take a load plan

Master Database

Documents Database

Calculation Engine

Data Objects

Load Plan

Shipments

Load Plan

APIs (Web Services Objects)
Inputs and outputs

**Inputs**
- Title/Description
- Container list
  - Name
  - Size
  - Capacity
  - Empty and Max Weight
- Cargo list
  - SKU
  - Size/Weight
  - Orientations
  - Stacking
- Rules
  - Grouping
  - Sequences
  - Stacking
- Option
  - Settings/UOM

**Outputs**
- Overview
- # of containers filled
- # of cargoes loaded/left
- Solutions
  - A list of containers filled
  - A list of spaces in the containers
  - A list of blocks in the containers
- Loading Guide
  - Step by step load list
  - Manifest
- Graphics
  - 3D/2D loading diagram
  - Weight distribution chart

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1. Send the shipment

CubeMaster Online Server (http://www.cubemaster.net)

4. Take a load plan

Shipment

Load Plan

APIs (Web Services Objects)
WEB SERVICES - 4

- Inputs and outputs

**Shipment**
- Title/Description
- Container list
  - Name
  - Size
  - Capacity
  - Empty and Max Weight
- Cargo list
  - SKU
  - Size/Weight
  - Orientations
  - Stacking
- Rules
  - Grouping
  - Sequences
  - Stacking
- Option
  - Settings/UOM
WEB SERVICES - 4

- Inputs and outputs

**Load Plan**
- **Overview**
  - # of containers filled
  - # of cargoes loaded/left
- **Solutions**
  - A list of containers filled
  - A list of spaces in the containers
  - A list of blocks in the containers
- **Loading Guide**
  - Step by step load list
  - Manifest
- **Graphics**
  - 3D/2D loading diagram
  - Weight distribution chart
How the Archive & Database Web Service work

3. The load plan uses the master database

5. The load plan stored to the database

APIs (Web Services Objects)
ALGORITHM

- Algorithm
  - Improved by more than 3,000 users in the world
  - Heuristics (Released at JORS 2006)
  - Meta Heuristics (Tabu Search + GA)

- ULD Types
  - Most industry standard sizes
  - The air container and air pallet can be modified and customized for your special size and shape in addition to standard database.

- Cargo Types
  - Rectangular
  - Unit Load
  - Roll
ALGORITHM - 2

- **Mix Load**
  - Finds optimal number of vehicles to load all orders of different size cartons or pallets. It also considers a unitization of the cargos before vehicle loading.

- **Unit Load**
  - Calculates full load of ULD filled with single size cargoes. There is no need to provide the quantities of cargoes because they are calculated by CubeMaster.
  - It also considers multiple pattern types in the full loads. The pallet unitload can be used as a cargo to be placed into a vehicle.
ALGORITHM - 3

- **Set Load**
  - Calculates the number of complete products to maximize the space utilization of the container when the product is consisting of several cargoes and the number of those cargoes should be kept in relational ratio.

- **Multi-Set Load**
  - Finds optimal number of vehicles to load all orders of different size cartons with regarding multiple destinations and stops.
LOAD RULES

Floor Stacking for Cargo Level
- Bottom Only, No Bottom and Best Fit selected together with the option Supports Others.
- Stack code and stack value available for the advanced stacking options.

Multiple Stacking Rules
- For meeting with your specific needs. Stacking matrix and stack codes are customizable.
Max Limits for Truck and Container

- Max weight, volume %, cost and number of cargoes for sea container or truck.

Cargo Orientations

- Loading rules at cargo level include the orientations allowed, max number of layers for each orientation and turning orientations allowed on the floor.
- Priority and special position available for each orientation.
Multiple Stops

- Load according to multiple stop offs and stop sequences. Each stop could have the priority or preferred container.

Sequential & Priority Loading

- Put cargoes in the same sequence, positions or sizes together.
LOAD RULES - 4

Supporting Rules
- Min support rate and max support weight for more accurate and stable loads.

Min Support Rate=51%
Weight=80Kg
Max Support Weight=100Kg

Min Support Rate=100%
Weight=80Kg
Max Support Weight=200Kg

Max Placement Size
- Limits the placement in vehicle for easy loading and unloading.

Before
A B C D E

After
A B C D D E E

Max Placement Size
Max Placement Size
Max Placement Size
Balance Control
- Use 4 rules to make full load into the remaining vehicles after initial load.
- Next Vehicles Exchanging: Changes the vehicles of lower space utilization with next smaller vehicles
- Order Pulling: Fills the vehicles of lower space utilization with the packages of next orders
- Order Rounding-Down: Drop the vehicle of lower space utilization (Total shipping amount decreased)
- Order Rounding-Up: Fills the vehicles of lower space utilization with the packages existing in the vehicles (Total shipping amount increased)

Piece Count of SKU
- Use the piece count for specific SKU. For example, a new ship case called BOX has 12 cans inside. You will enter 12 as the piece count when defining BOX as a new SKU. When you add a quantity of 100 BOX to the load list, the total piece count will indicate 1200 cans.

No Turning on the Bottom of Vehicle
- Even when all orientations permitted, control allowance of the turning orientations on the bottom of vehicle.
LOAD RULES - 6

Partial Load through Locking
- You can lock loads or vehicles to prevent them from changing next load. Through this rule, you can make a partial loads and fleets plan.

Change Vehicle Type on the fly
- Without reloading all vehicles, you can replace the specific vehicle with another type with just one-click.

Loose Item
- Breaks up pallet loads and load the SKUs in the pallet as loose items to fill vacant space in the vehicle.

Limit Load Weight and Volume
- Controls total loads not exceed the maximum weight and volume of the vehicle. It allows the user for example to equally divide the boxes among the available containers.

Axle Weight and Center of Gravity
- Axle weight and exact location of center of gravity for all loads are calculated automatically.
SCREEN SHOTS
LOAD SAMPLES — AIR CARGO OPTIMIZATION
MAIN CUSTOMERS

- Mitsubishi Electronics, Japan
- Energizer, Singapore
- Samsung Electronics Home Appliance, USA
- SONY Electronics, Philippines
- Nike, USA, China
- Starbucks, LTD, USA
- LG Electronics, Belgium
- Boeing Company, USA
- Far East Brokers and Consultants, Inc., USA
- Samsung Electronics White Electronics, Korea
- Niagara Conservation Corp. USA
- Markpeak, Hong Kong
- FRACHT, NETHERLANDS
- Medopharm, India
- Chocolat Frey AG, Switzerland
- SVC Limited, Shenzhen, China
- THE SEMKGROUP, Hong Kong
- 3M, Thailand
- NYK Logistics, Singapore
- DSIDE International, Italy
- TP Activity Toys, UK
- Excellence, Hong Kong
- Event Fabrication Services, Australia
- Panasonic AVC Networks, USA
- POLYLUX, S.L., Spain
- Leeward Espana, S.L. Spain
- Michael Zagler, Spain
- Seaway Network, Iran
- Unity Opto Technology, Taiwan
- Gander and White Shipping, France

- Nintendo, USA
- Globe Express, USA
- DHL, South Africa, India, Australia, Turkey
- Eley Corporation, USA
- ERIMEX Limited Liability Company, Russia
- Hannibal Industries, USA
- Hyundai Motor Company, Automobiles, Korea
- LG Electronics White Electronics, Korea
- Hyundai MOBIS, Automotive, Korea
- LAMPLUX CO., LTD., China
- BAX Global, Shanghai, China
- Joke Confectionery, Gum, Biscuit & Snack, Korea
- Ludwig Transport Limited, Germany
- Shmetmetal Fabricated Products, New Zealand
- Hoffman's, Netherlands
- International Trade & Research, Israel
- Chombo Suits Corp. Thailand
- Maclaren, Hong Kong
- Unilever, Egypt
- Plastic Omnium, France
- SKC Co., Ltd, Digital Media, Korea
- Pacific Co., Ltd., Cosmetic, Commodities, Korea
- Hankook Tires, Korea
- BEInteractive, Australia
- Instore Products Limited, Canada
- Impact Plastics, USA
- Bauli SPA, Italy
- LISEGA SE, Germany
- LETSARA Transportes Logistica, Brasil

More than 4,000 companies
Logen Solutions USA

Andrew Chang

Ph.D. Vice President
Email: chang@logensolutions.com

US Office:
3003 North 1st Street San Jose, USA CA 95134
Tel: +1 (408)519-5771

Korean Office:
7F, Building# 103, Digital Empire 2, Suwon, Korea
Mobile: +82-16-9816-4633
Tel: +82-2-466-6091
Fax: +82-2-466-6093