

# TOSHIBA

Orchestrate tasks, resources, and material handling equipment

## WES | Warehouse Execution System

Assisting efficient allocation of resources and planning of operations, to its execution.

Maximize utilization of all warehouse resources, through analysis, visualization, and optimization.

**AI**  
×  
**Mathematical optimization**

Ranked "third in the world"\*1 for the number of patent applications, enables advanced optimization.

**On-site know-how**  
×  
**ICT**

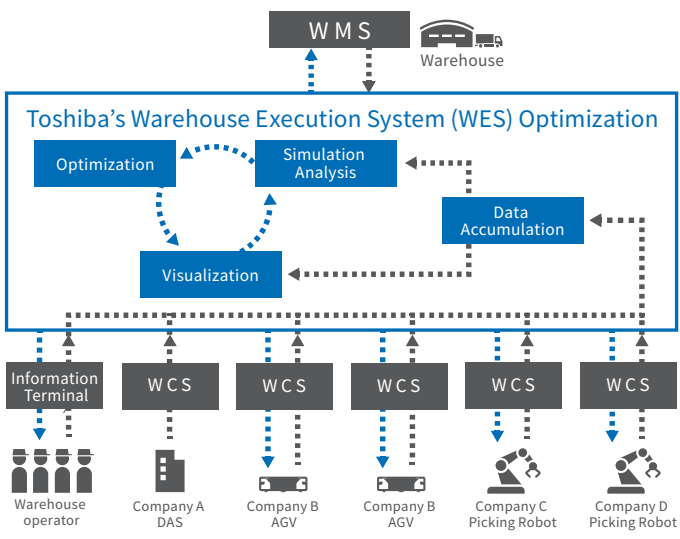
Gained through logistics solutions that support Toshiba group's logistics.

**Robotics**  
×  
**Engineering**

Flexible automation corresponding to a variety of goods and sites.

\*1 Source: "WIPO Technology Trends 2019" by World Intellectual Property Organization

### Conceptual Diagram



- Monitor operation status**  
Monitor status of operators and machines
- Link data**  
Convert data for API integration
- Optimize DC management & collaboration**  
Optimize and execute operations within the Distribution Center or Warehouse
- Monitor work progress**  
Monitor progress of various indicators, and manage forecast and actual results
- Predict work progress**  
Predict progress and completion of work
- Monitor management index**  
Monitor management index and KPIs
- Optimize TC management & collaboration**  
Optimize and execute operations within the Transfer Centers
- Optimize delivery services**  
Optimize and execute transportation and delivery operations
- Big data analysis & prediction**  
Predict workload and necessary assets for specific periods

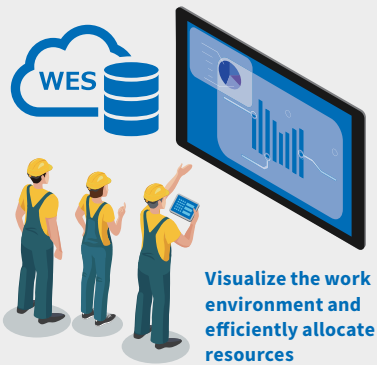
## Service Menu

Categories		Items
Visualization	Monitoring	Equipment status monitoring and mapping
	Dashboard	Operator status monitoring and mapping
Analysis / Prediction	Prediction	Work completion time prediction
	Data accumulation	Log data saving
Optimization	Personnel	Personnel adjustment guidance
	Equipment	Shipping invoice (order) optimization
Integration with external systems	WMS API	WMS data integration & conversion: in/outbound deliveries, work status, log-in information, etc.
	WCS API	WMS data integration & conversion: loading & unloading, error alerts, results, equipment status, tasks, logs, etc.

## Use Cases

### Optimize tasks with guided resource allocation

The WES predicts work completion times, and checks for possible bottlenecks in any of the routes or work groups. The team leaders are alerted and receive a suggestion of where to reallocate their staff, in order to smoothly execute the necessary tasks of the day.



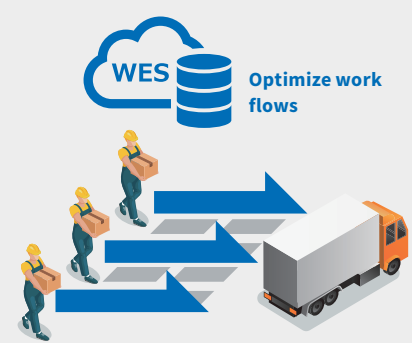
### Increase productivity with collaboration between machines

Reduce workload of managers and improve overall throughput within the warehouse. With integration APIs for each WCS, machines can execute tasks by considering the availability of other automation equipment within the warehouse.



### Optimize stock allocation by taking into account the workload in certain work areas

Increase throughput on-site by allocating resources as suggested by the WES. The WES recommends optimal storage areas to operators, by taking into account the workload and progress in each area of the warehouse.



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