

“Fitness” - Analysis of Main Functions for ATM Automation system

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NanJing, November 22, 2018

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Background

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Core Function Analysis

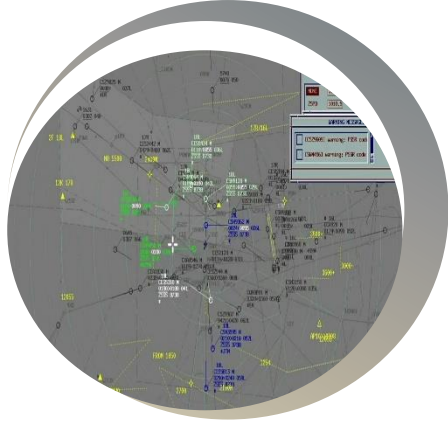
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Suggestions



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Background



CAPACITY INCREASE



**ARCHITECTURE
CHANGE**



**FUNCTIONS
ENHANCEMENT**



Rough Comparison



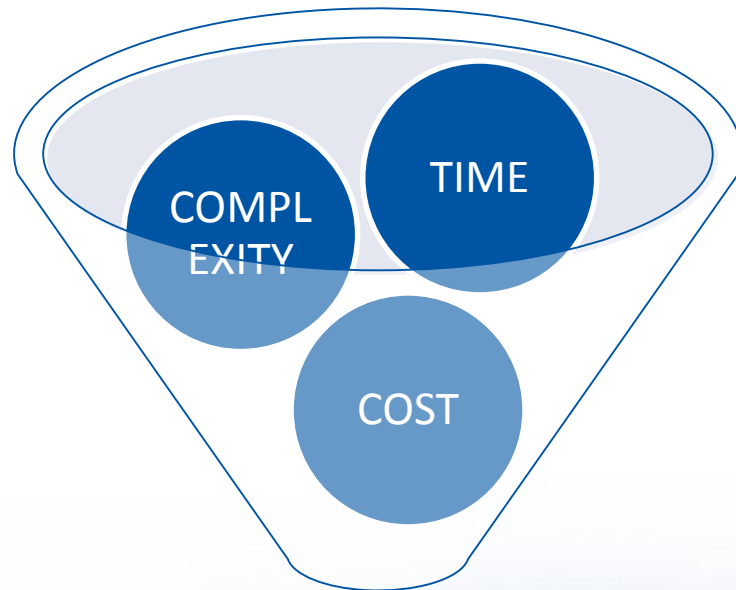
Features	New system	Old system
Partitions	6	1
MAX HMI/Sector	400/160	26/26
MAX ADS-B/RADAR	20/32	0/16
Warning and Alert	45	12
MAX FPLs	20000	3000
Function windows in MMI	171	24



Problem Description



- System Complexity
- High business cost
- More time to deploy



Inherited from other sites

Non-constant requirements

Convenience and external demand





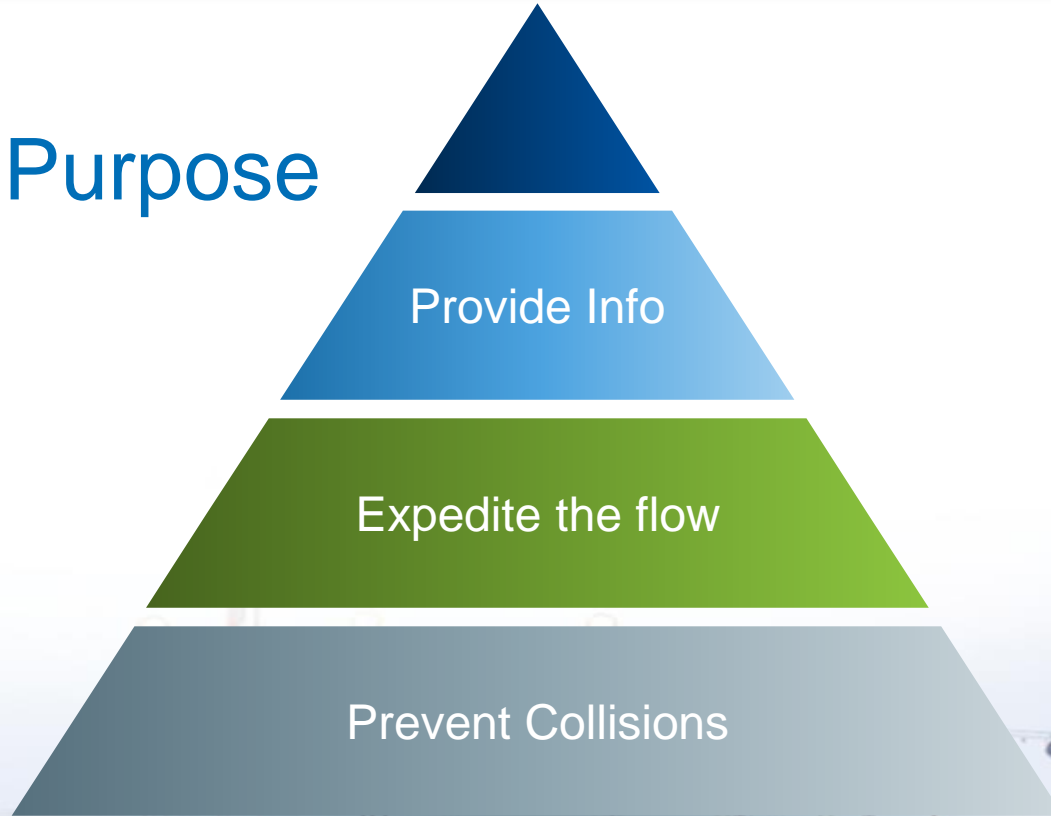
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Air Traffic Control Service



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- Main Purpose



User
Layer

HMI Module

Service
Layer

Surveillance
data
Processing

Flight Data
Processing

Coupling
Data
Processing

Warning
and Alarm
Processing

Interface
and data
sharing

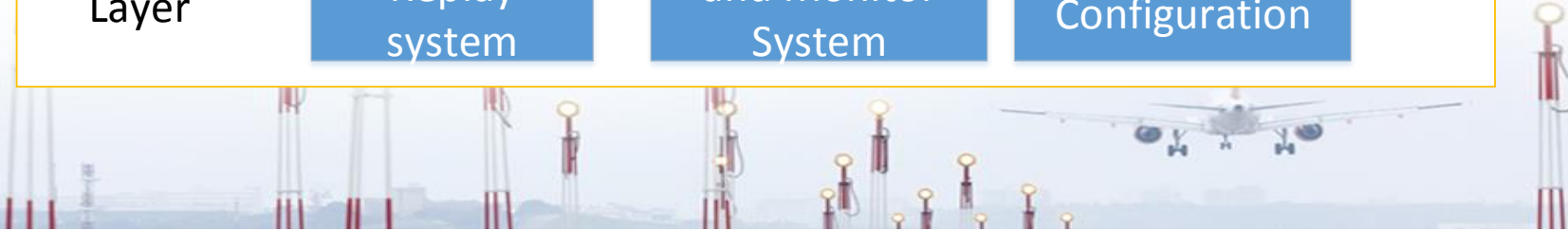
AMAN
Processing

Off-line
Layer

Record and
Replay
system

Remote Control
and Monitor
System

Parameters
Configuration



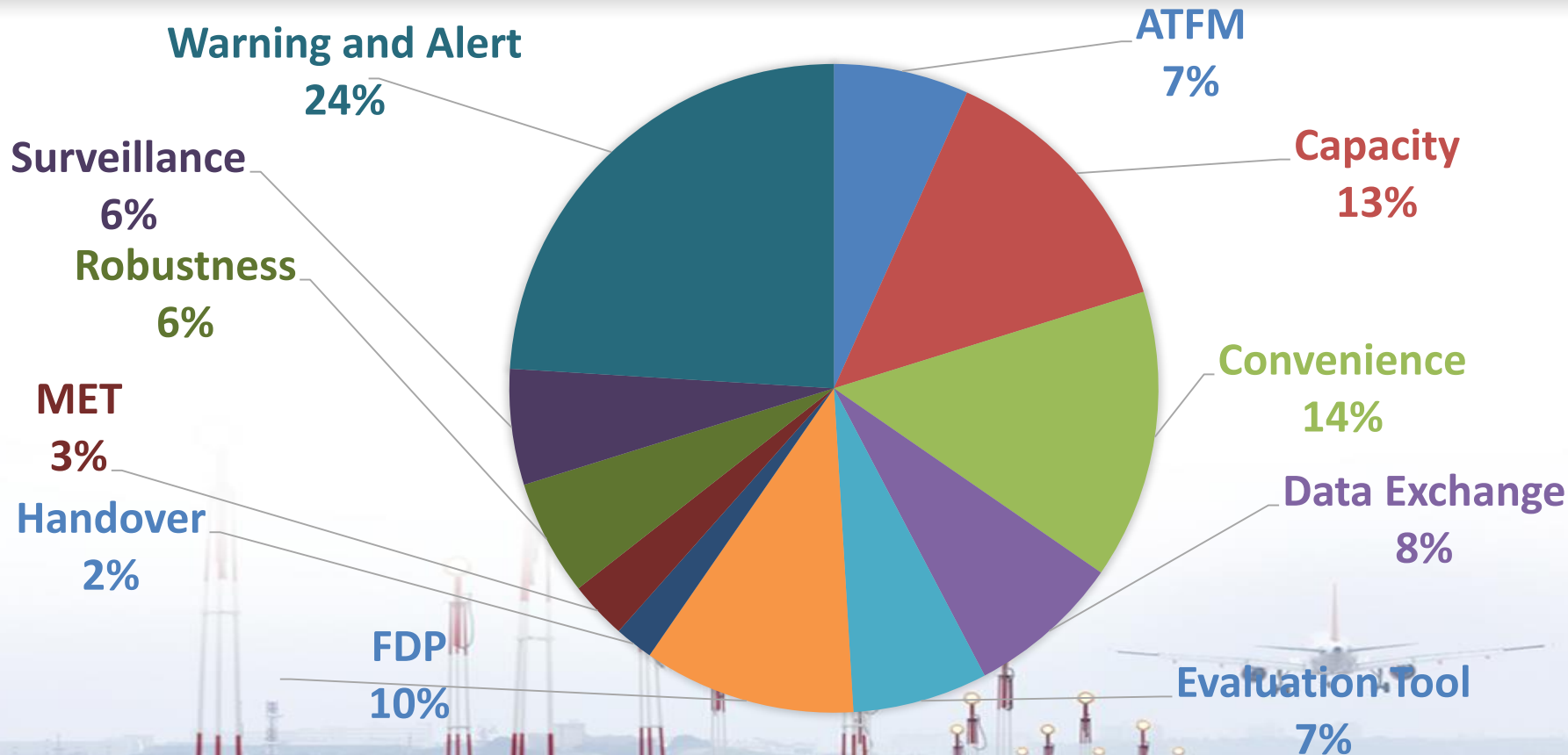


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NESACC Function Requirements



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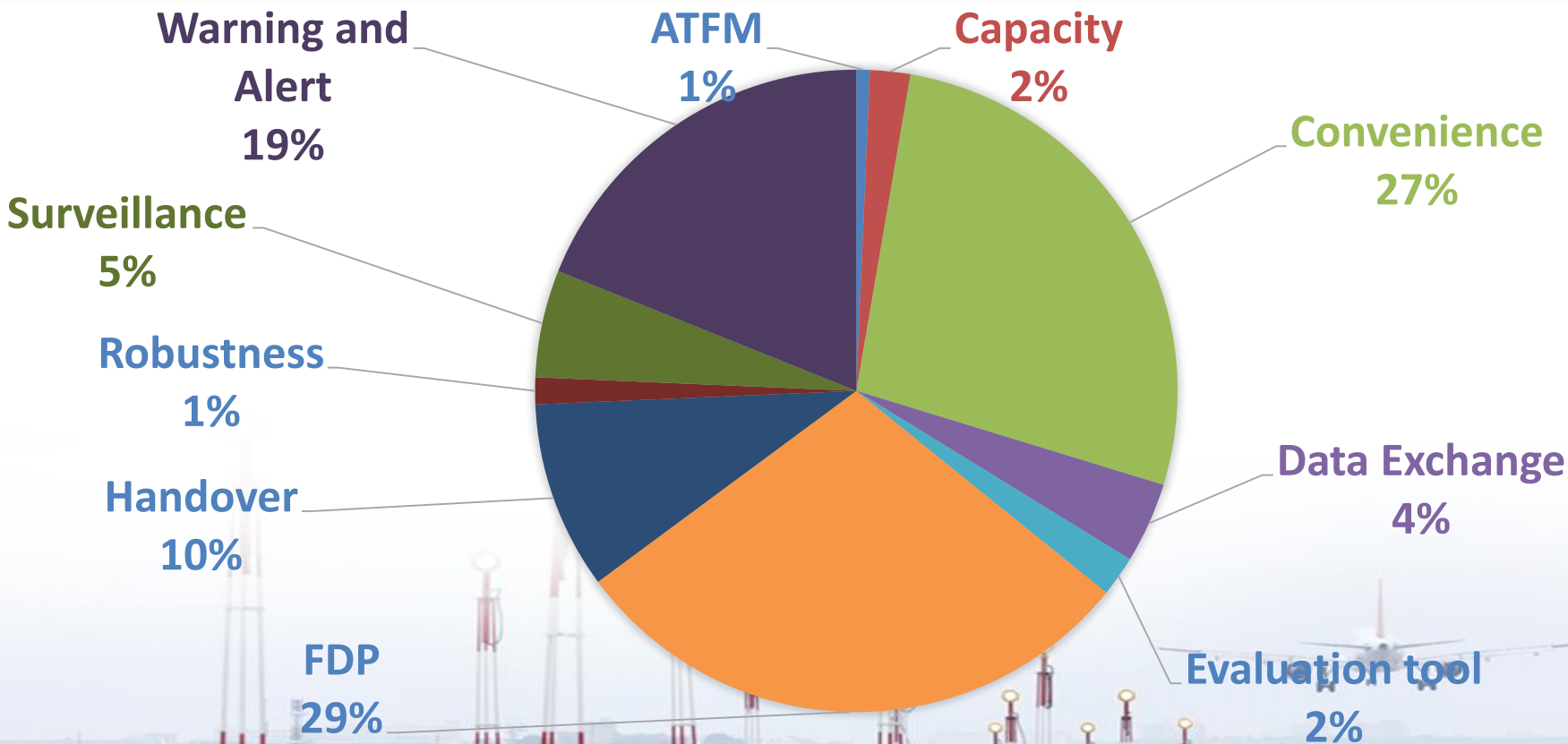


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Other Sites Function Requirements

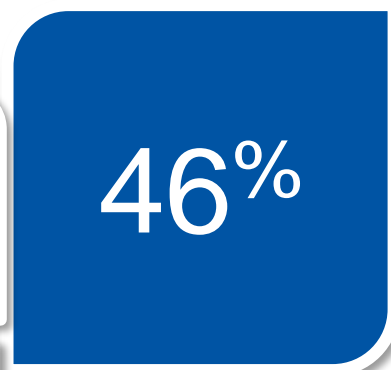
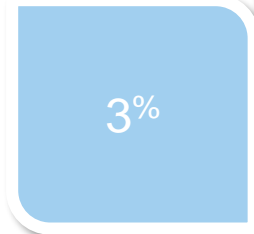


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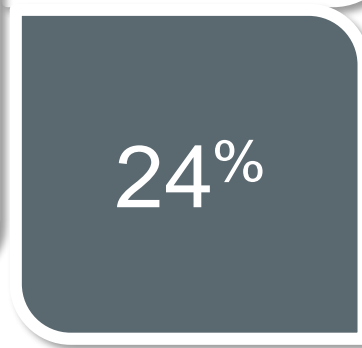
Issues Found

**ATFM +
Evaluation tool**



**FDP+
Convenience**

**Handover +
Data Exchange**



**Warning +
Surveillance**

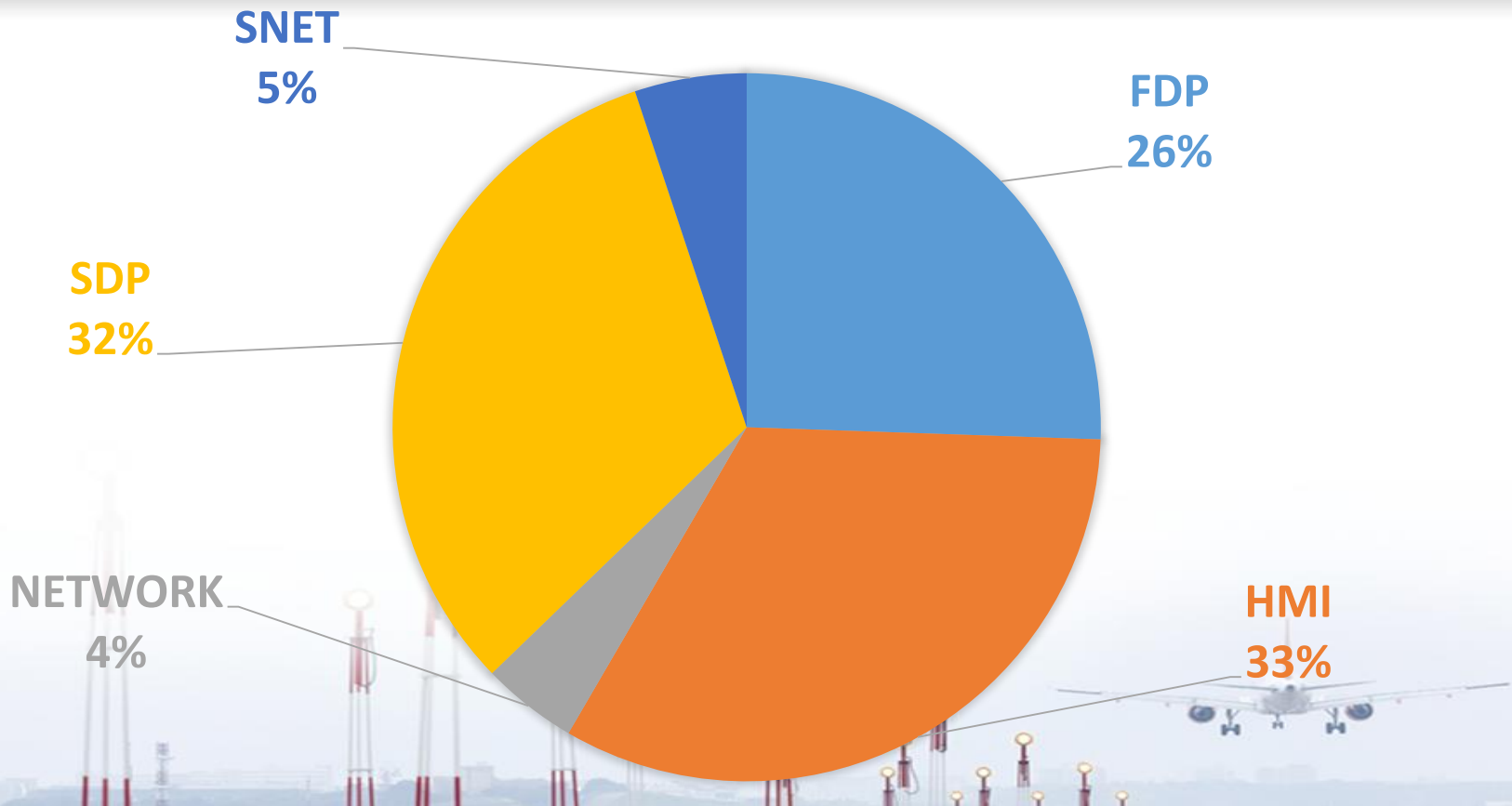


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Module Failures Statistics



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- ◆ *Application of software requirement engineering*
- ◆ *Migration of non-core functions*



Function requirement name	Monthly usage times for one position	Complexity	Benefits	Substitutability
BRL enhancement	More than 11 thousands times	Low	Key operation for collision avoidance	No
OPDATA extension	More than 96 thousands times	Low	Key operation for information sharing	No
Radar Tag enhancement	16 times	High	Identify uncoupled tracks	No







FUNCTIONS REMOVED or TO BE REMOVED FROM ATC SYSTEM		EXTERNAL SYSTEM
ADS-B data pre-processing and validation check		ADS-B Data Center
FPL editing and distribution		Central Flight Plan Processing System
ARR and DEP messages sending and tower paper strip print		TWR EFS System
Controller behavior analysis using ATC system database		ATC Quality Analysis System





FUNCTIONS REMOVED or TO BE REMOVED FROM ATC SYSTEM

EXTERNAL SYSTEM

SSR code allocation		SSR Code Allocation and management System
Departure flights scheme		CDM/DMAN System
Billing function		Aviation charging system
Incident investigation		Post accident/incident assessment and analysis system



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Conclusion



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*Thanks for your
attention.*

