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Review Article

Comparing Product Availability Checks in SAP

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Abstract *- This paper presents a comprehensive comparison of the various product availability check solutions available in SAP, including Available-to-Promise (ATP), Global Available-to-Promise (GATP), and Advanced Available-to-Promise (AATP). The study evaluates the capabilities of each solution in terms of real-time inventory checks, order management, scheduling, and product allocation optimization. The comparison considers factors such as accuracy, reliability, flexibility, and cost-effectiveness. Additionally, the paper examines the impact of each solution on production schedules, inventory costs, and customer satisfaction. The study reveals that while all three solutions offer effective ways to manage product availability, the best choice depends on the business's specific needs. The comparison results provide valuable insights for businesses seeking to optimize their product availability checks in SAP.*

Keywords *- Supply chain management, SA, ATP, GATP, AATP, Availability check solutions, Inventory management production planning.*

1. Introduction

In today's fast-paced and highly competitive business environment, companies are facing increasing pressure to optimize their supply chain operations and improve customer satisfaction. One of the critical aspects of supply chain management is the ability to provide accurate and reliable information on product availability, delivery dates, and lead times. Many organizations rely on availability check solutions in their SAP systems to achieve this goal, which helps them balance customer demands with inventory levels, production schedules, and transportation constraints [1].

Availability check solutions in SAP come in different types and versions, each with strengths and limitations. The three main types of availability check solutions widely used in SAP are Available to Promise (ATP), Global Available to Promise (GATP), and Advanced Available to Promise (AATP) [2, 3]. ATP provides real-time information on product availability and considers current inventory levels, incoming goods receipts, and outgoing deliveries to calculate the available-to-promise quantity. GATP extends the functionality of ATP by considering multiple plants, regions, and distribution centers and incorporating various constraints, such as transportation lead times, production capacity, and quality control checks. AATP is a newer availability check solution that leverages predictive analytics and machine learning algorithms to improve the accuracy and responsiveness of availability checks by considering historical sales data, demand forecasts, and production schedules.

Despite the benefits of availability check solutions in SAP, several challenges and limitations are associated with their implementation and optimization. These challenges include data quality issues, system integration complexity, user adoption barriers, and scalability constraints [4]. Ensuring data accuracy and consistency across different systems and modules is crucial for the success of availability check solutions. Integration with other SAP modules, such as Production Planning (PP) and Sales and Distribution (SD), requires careful configuration and testing to avoid conflicts and errors. User adoption and training are also critical factors in the success of availability check solutions, as sales representatives and customers need to understand and trust the system outputs. Finally, scalability is a key consideration in selecting availability check solutions, as organizations need to balance performance requirements, hardware resources, and license costs.

In this paper, we will compare the features, advantages, and limitations of ATP, GATP, and AATP availability check solutions in SAP and provide practical recommendations for organizations to choose the most suitable solution for their specific business needs. The rest of the paper is organized as follows. Section 2 provides a literature review of the existing research on availability check solutions in SAP. Section 3 describes the methodology and data sources used in our comparative analysis. Section 4 presents the results and findings of our analysis. Section 5 discusses the implications and limitations of our study and proposes future research directions. Finally, Section 6 summarizes the paper's main conclusions and provides practical recommendations for organizations to improve their availability check processes.

2. Literature Review

In today's dynamic and hyper-competitive business landscape, companies are facing increasing pressure to optimize their supply chain operations and enhance customer satisfaction. The ability to provide accurate and timely information on product availability, delivery dates, and lead times is critical for achieving these goals [5]. To meet this need, organizations often rely on availability check solutions within their SAP systems.

The three main types of availability check solutions widely used in SAP are Available to Promise (ATP), Global Available to Promise (GATP), and Advanced Available to Promise (AATP) [2, 3]. ATP is the most basic type of availability check solution, providing real-time information on product availability by considering current inventory levels, incoming goods receipts, and outgoing deliveries to calculate the available-to-promise quantity [5]. GATP extends the functionality of ATP by considering multiple plants, regions, and distribution centers, as well as various constraints such as transportation lead times, production capacity, and quality control checks [5, 6]. AATP is a newer solution that leverages predictive analytics and machine learning algorithms to improve the accuracy and responsiveness of availability checks by incorporating historical sales data, demand forecasts, and production schedules [7].

Although availability check solutions offer significant benefits, implementing and optimizing them can be challenging [4, 5]. Data quality issues, system integration complexity, user adoption barriers, and scalability constraints are among the main challenges associated with these solutions. Ensuring data accuracy and consistency across different systems and modules is essential for the success of availability check solutions [5, 8]. Integrating with other SAP modules, such as Production Planning (PP) and Sales and Distribution (SD), requires careful configuration and testing to avoid conflicts and errors [4, 5]. User adoption and training are critical factors in the success of availability check solutions, as sales representatives and customers need to understand and trust the system outputs [4, 5, 9]. Finally, scalability is a key consideration in selecting availability check solutions, as organizations need to balance performance requirements, hardware resources, and license costs [5, 8].

Several studies have investigated the benefits and challenges of availability check solutions in SAP. For example, Wang and Li [10] compared ATP and GATP and proposed a hybrid approach that combines the strengths of both solutions. Li et al. [11] developed a simulation model to evaluate the impact of different inventory policies on the performance of GATP. Cai et al. [12] proposed an algorithm that integrates AATP with Production Planning and Detailed Scheduling (PPDS) to improve the accuracy and responsiveness of availability checks. While these studies provide valuable insights, there is still a need for a comprehensive comparison of ATP, GATP, and AATP that considers their features, advantages, and limitations in the context of different business scenarios.

In this paper, we aim to fill this gap by conducting a systematic comparison of ATP, GATP, and AATP availability check solutions in SAP. We will evaluate their performance based on various criteria such as accuracy, responsiveness, scalability, and user adoption. By providing practical recommendations and insights, this study can help organizations choose the most suitable availability check solution for their specific business needs.

3. Methodology

3.1. System

The first parameter to consider is the type of system that the availability check solution is deployed on. The most common systems used for availability check solutions are ECC, IBP, and S/4 HANA. We will consider the specific release applicable to each system.

3.2. Architecture

The second parameter to consider is the architecture of the system. Availability check solutions can be deployed on-premise or on the cloud. We will evaluate the benefits and limitations of each architecture and their impact on the availability check solution.

3.3. User Interfaces

The third parameter to consider is the user interface of the availability check solution. We will evaluate the user interfaces available and how they impact user adoption and efficiency.

3.4. Integration

The fourth parameter to consider is integration. Availability check solutions need to integrate with other modules, such as Production Planning (PP) and Sales and Distribution (SD). We will evaluate the integration capabilities of each solution and any limitations.

3.5. Data Integration

The fifth parameter to consider is data integration. Ensuring data accuracy and consistency across different systems and modules is crucial for the success of availability check solutions. We will evaluate the data integration capabilities of each solution.

3.6. System Scalability

The sixth parameter to consider is system scalability. Availability check solutions need to be scalable to meet the needs of growing organizations. We will evaluate the scalability of each solution and any limitations.

3.7. System Performance

The seventh parameter to consider is system performance. Availability check solutions must perform

optimally to meet customers' demands. We will evaluate the performance of each solution and any limitations.

3.8. Deployment Model

The eighth parameter to consider is the deployment model. Availability check solutions can be deployed on-premise, on the cloud, or in a hybrid model. We will evaluate the benefits and limitations of each deployment model.

3.9. Licensing Model

The ninth parameter to consider is the licensing model. Availability check solutions can be licensed in different ways, such as per user or per transaction. We will evaluate the licensing models available and their impact on cost.

3.10. Migration

The tenth parameter to consider is migration. Organizations may need to migrate from one availability check solution to another. We will evaluate the migration process and any limitations.

3.11. Analytics, AI & Machine Learning

The eleventh parameter to consider is each solution's analytics, AI, and machine learning capabilities. We will evaluate the benefits and limitations of each solution's analytics capabilities.

3.12. User Community

The twelfth parameter to consider is the user community. The availability check solution should have an active user community to support users and share best practices. We will evaluate the user community available for each solution.

3.13. Future Road Map

The thirteenth parameter to consider is the future road map of each solution. We will evaluate each solution's planned features and improvements and their impact on the organization.

3.14. Product Allocation

The fourteenth parameter to consider is product allocation. The availability check solution should be able to allocate products to customers based on their demands. We will evaluate the product allocation capabilities of each solution.

3.15. Backward Scheduling

The fifteenth parameter to consider is backward scheduling. The availability check solution should be able to calculate the production start date based on the required delivery date. We will evaluate the backward scheduling capabilities of each solution.

3.16. Capable to Promise

The sixteenth parameter to consider is capable to promise. The availability check solution should be able to provide accurate and reliable information on product availability, delivery dates, and lead times. We will evaluate the capable-to-promise capabilities of each solution.

3.17. Optimization

The seventeenth parameter to consider is optimization. The availability check solution should be able to optimize the supply chain operations to improve efficiency and reduce costs. We will evaluate the optimization capabilities of each solution.

The study will use a mixed-methods approach, including a systematic review of the existing literature, case studies, and expert interviews, to evaluate the SAP systems' features, functionalities, and capabilities in terms of innovation, improved planning, better customer service functionality, enhanced supply chain management, increased efficiency, improved decision making, planning horizons, demand planning, supply planning, capacity planning, order promising, product allocation, transportation planning, integration with other modules, business process automation, supply chain collaboration, advanced planning, pricing and licensing, upgrade and maintenance, and future growth potential[22]. The study will provide practical recommendations for organizations to choose the most suitable SAP system for their specific business needs.

4. Results

Table 1. Comparison of ATP checks in SAP

	ATP	**GATP**	**AATP**
System	SAP ECC	APO	SAP S/4 HANA
Release	ECC 6.0 and earlier	SAP SCM 5.1 and later	S/4HANA 1610 and later
Architecture	Monolithic - On-premise	Distributed - On-premise or cloud	In-memory - On-premise or cloud
Cloud Enablement	Not available	Available in private cloud	Public & Private Cloud
User Interface	SAP Gui	Web UI	Fiori Ux
Integration	Native	Require APO/IBP	Native
Data integration	Limited	Advanced	Advanced
System scalability	Limited	Scalable architecture and infrastructure to handle larger data volumes and more planning scenarios.	

System Performance	Limited performance due to system architecture & data volume limitations	Improved performance due to advanced algorithms and in-memory computing	High performance due to in-memory computing and advanced algorithms
Deployment Model	On-premise and Private Cloud	On-premise and Private Cloud	On-premise and Private Cloud
Licensing	Named User Licenses and Package Licenses (limited)	Processor-based and Named User Licenses	Named User Licenses, Package Licenses, and Subscription Licenses
Simplified IT landscape	Limited integration and complex migration process from ECC to S/4HANA	Integration with APO and simpler migration process from ECC or APO to S/4HANA	Simplified migration process from ECC or APO to S/4HANA or from non-SAP systems to S/4HANA
Migration	Complex migration process from ECC to S/4HANA	Complex migration process from ECC to S/4HANA or APO to S/4HANA	Simple migration process from ECC or APO to S/4HANA or from non-SAP systems to S/4HANA
Analytics	Basic analytics capabilities, integration with SAP Business Warehouse, and SAP Lumira	Integration with SAP Business Warehouse and SAP Lumira	Embedded analytics capabilities, integration with SAP Analytics Cloud, and SAP Digital Boardroom
AI and Machine Learning	Not Available	Basic AI and Machine Learning capabilities for prediction and optimization	Advanced AI and Machine Learning capabilities for prediction, optimization, and anomaly detection
User Community	Large and mature user community	Smaller and specialized user community	Growing user community with a focus on innovation
Future Roadmap	limited future development due to the end-of-support timeline	Ongoing development and support with a focus on cloud deployment and integration	Ongoing development and support with a focus on cloud deployment, advanced analytics, and machine learning
Real-Time planning	No	Yes	Yes
Order Promising	Yes	Yes	Yes
Product allocation	Yes	Yes	Yes
Backward scheduling	Yes	Yes	Yes
Available to promise	Basic functionality	Advanced functionality	Advanced functionality
Capable to promise	No	Basic functionality	Advanced functionality
Optimization	Basic rule-based	Advanced algorithm	Advanced algorithm
Innovation	Limited	Advanced AI and machine learning capabilities for prediction and optimization	Advanced AI and machine learning capabilities for prediction, optimization, and anomaly detection, enable businesses to innovate their supply chain processes.
Improved Planning	limited capability to provide real-time information and visibility	Provides real-time visibility into inventory, demand, and supply	Offers real-time visibility into inventory, demand, and supply with advanced planning algorithms and machine learning

Better customer service	Provides basic order promising and product allocation functionality	Offers advanced order promising and product allocation functionality	Offers advanced order promising and product allocation functionality with the ability to optimize supply chain processes
Enhanced supply chain management	Limited integration with other SAP supply chain modules such as PP, MM, and SD	Integration with other SAP supply chain modules such as PP, MM, and SD	Integration with other SAP supply chain modules such as PP, MM, SD, PP/DS, IBP, and EWM for improved supply chain planning and execution
Improved Decision making	limited analytics capabilities	Integration with SAP Business Warehouse and SAP Lumira	embedded analytics capabilities with the ability to connect to SAP Analytics Cloud and SAP Digital Boardroom for real-time decision-making
Planning Horizons	Short-term planning (days to weeks)	Short-term to mid-term planning (weeks to months)	Short-term to long-term planning (months to years)
Demand Planning	Limited forecasting capabilities	Advanced forecasting and demand sensing capabilities	Advanced forecasting and demand sensing capabilities
Supply Planning	Basic supply planning based on fixed rules	Advanced algorithmic optimization and what-if analysis	Advanced algorithmic optimization and what-if analysis
Capacity Planning	Limited capacity planning functionality	Advanced capacity planning and bottleneck analysis	Advanced capacity planning and bottleneck analysis
Transportation planning	Limited transportation planning capabilities	Advanced transportation planning and optimization	Advanced transportation planning and optimization
Integration with Other modules	Basic integration with SAP PP, SD, and MM	Advanced integration with SAP PP, SD, MM, PP/DS, IBP, and EWM	Advanced integration with SAP PP, SD, MM, PP/DS, IBP, and EWM
Business Process Automation	Limited automation capabilities due to system limitations	Advanced automation capabilities using SAP Workflow and SAP Process Orchestration	Advanced automation capabilities using SAP Workflow, SAP Cloud Platform Workflow, and SAP Intelligent Robotic Process Automation
Supply Chain Collaboration	Limited collaboration capabilities due to system limitations	Advanced collaboration capabilities with SAP Integrated Business Planning (IBP) and SAP Ariba	Advanced collaboration capabilities with SAP IBP and SAP Ariba, as well as other partner solutions such as E2open and Elemica
Advance Planning	Limited advanced planning capabilities due to system limitations	Advanced planning capabilities with SAP APO-GATP and SAP IBP	Advanced planning capabilities with SAP IBP, including demand planning, supply planning, inventory optimization, and sales and operations planning
Pricing & Licensing	Traditional licensing model based on the number of users and modules	Subscription-based licensing model based on usage and features	Subscription-based licensing model based on usage and features
Upgrades and Maintenance	Time-consuming and complex upgrade and maintenance processes	Streamlined upgrade and maintenance processes with SAP Maintenance Planner and SUM	Streamlined upgrade and maintenance processes with SAP Maintenance Planner and SUM
Cost of Implementation	Relatively low cost of implementation due to simpler system architecture and limited features	High cost of implementation due to complex system architecture and advanced features	High cost of implementation due to complex system architecture and advanced features
Cost of	Lower cost of ownership	Higher cost of ownership due to	Higher cost of ownership due to

Ownership	due to simpler system architecture and limited features	complex system architecture and advanced features, but may be offset by increased efficiency and reduced costs.	complex system architecture and advanced features, but may be offset by increased efficiency and reduced costs.
Efficiency & productivity	Limited efficiency gains due to limited features and automation capabilities	Potential for significant efficiency gains through advanced automation and optimization capabilities	Potential for significant efficiency gains through advanced automation and optimization capabilities
Revenue Generation	Limited revenue generation potential due to limited planning and optimization capabilities	Potential for increased revenue through improved planning, forecasting, and customer service capabilities	Potential for increased revenue through improved planning, forecasting, and customer service capabilities
Cost Reduction	Limited cost reduction potential due to limited optimization and automation capabilities	Potential for significant cost reduction through advanced optimization and automation capabilities	Potential for significant cost reduction through advanced optimization and automation capabilities
Time to Value	Shorter time to value due to simpler implementation and limited features	Longer time to value due to complex implementation and advanced features, but the potential for greater ROI over time	Longer time to value due to complex implementation and advanced features, but the potential for greater ROI over time
Future Growth Potential	Limited growth potential due to the end-of-support timeline and limited fea	Potential for growth through increased efficiency, productivity, and revenue generation capabilities	Potential for growth through increased efficiency, productivity, and revenue generation capabilities

5. Implications & Limitations

Implications: The comparison analysis of the availability check solutions in SAP reveals several implications for organizations that use or plan to implement these solutions. Firstly, the choice of the most suitable solution depends on the specific business needs, constraints, and priorities of the organization. For example, organizations with complex supply chains and multiple plants may benefit from the advanced features of GATP, while those focusing on customer service and responsiveness may prefer AATP.

Secondly, the implementation and optimization of availability check solutions require a holistic approach that considers not only the technical aspects but also the organizational and process-related factors. Successfully implementing and adopting availability check solutions require data accuracy and consistency, user training and support, integration with other SAP modules, and scalability considerations.

Limitations: The comparison analysis has some limitations that should be acknowledged. Firstly, the analysis is based on the information and data available from online sources and SAP documentation, which may not reflect the actual experiences and challenges of organizations. Secondly, the analysis does not cover all possible scenarios and use cases of availability check solutions. There may be other factors and considerations that affect the choice and implementation of these solutions.

Thirdly, the analysis does not provide a detailed cost-benefit analysis of the different solutions, and organizations should conduct their analysis to evaluate the financial and operational impacts of implementing these solutions. Finally, the analysis does not address the broader trends and challenges in supply chain management, such as sustainability, resilience, and digitalization, which may influence the future development and adoption of availability check solutions.

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6. Conclusion

In conclusion, supply chain management is a critical area of focus for companies looking to succeed in today's fast-paced and highly competitive business environment [13][21]. Availability check solutions in SAP, such as ATP, GATP, and AATP, can help organizations balance customer demands with inventory levels, production schedules, and transportation constraints [14]. However, the implementation and optimization of these solutions can pose several challenges and limitations, including data quality issues, system integration complexity, user adoption barriers, and scalability constraints [15].

Our comparison analysis of ATP, GATP, and AATP availability check solutions in SAP has shown that each solution has its strengths and limitations, and organizations should choose the most suitable solution based on their specific business needs [16]. While ATP provides real-time information on product availability, GATP extends its functionality by considering multiple plants, regions, and distribution centers. AATP leverages predictive analytics and machine learning algorithms to improve the accuracy and responsiveness of availability checks [17].

To successfully implement and optimize availability check solutions in SAP, organizations need to ensure data accuracy and consistency, carefully configure and test system integrations, prioritize user adoption and training, and balance performance requirements, hardware resources, and license costs [18]. Furthermore, the integration with other SAP modules, such as Production Planning (PP) and Sales and Distribution (SD), and the automation of business processes and supply chain collaboration can further improve the effectiveness and efficiency of availability check solutions [19].

Overall, availability check solutions in SAP can help organizations improve their planning, decision-making, and customer service functionality, enhance their supply chain management, increase efficiency and productivity, and reduce costs. However, the success of these solutions depends on various factors, including pricing and licensing, upgrade and maintenance, cost of implementation and ownership, revenue generation, time to value, and future growth potential. Therefore, organizations should carefully evaluate the implications and limitations of implementing availability check solutions in SAP and seek expert advice and support to maximize their benefits and minimize risks [20].

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