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OpenPEPPOL AISBL

AS4 Market Readiness

Survey Report

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Statement of copyright

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1 Document information

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Approvals

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Name	Signature	Title	Date of Issue	Version

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2 Backgrund and purpose

On 19 September 2016, the European Commission and OpenPEPPOL signed a Letter of Understanding[1] (LoU), outlining the transition from AS2 to AS4 message exchange protocols within the PEPPOL eDelivery Network.

In the LoU, OpenPEPPOL has agreed to the mandatory use of AS4 as message exchange protocol within the PEPPOL eDelivery Network, provided certain conditions are met. To achieve this, the parties have agreed to a well-defined, step-by-step transition process. Four sequential steps of the transition process is described in the LoU, along with criteria for entering each step.

Phase	Step	CEF	Timeline	Protocol LCM Step	Associated Criteria
Start of Phase In	T1	Work Programme 2016	Q4 2016	AS4 adopted as optional protocol	3 a
Phase in	T2		Q4 2017	Announcement of T3	1 a-c, 2 a-b, 3 b-c, 5 a-d
Transition	T3	• Work Programme 2017 • Work Programme 2018	T2 + 18 (*) months if conditions are met	AS4 Mandatory in the PEPPOL eDelivery network – Transition Target Date	2 c, 4 a-d
Phase Out	T4		TBD	AS2 Phase-out	4e

The "*Protocol LCM Step*" indicated in the above table extracted from the LoU, describes the consequence resulting from the fulfilment of the step criteria at the end of the timeline indicated. This implies that the LoU indicates Q2 2019 as the target date for mandatory use of AS4 within the PEPPOL eDelivery network.

As part of the T3 criteria, the condition 4 a) says that "*In T2 OpenPEPPOL will survey its Users to identify the integration platforms in use. In T3, the same survey will be run by OpenPEPPOL. The results of the T3 survey should show that the majority of platforms in use support both AS2 and AS4*".

On this background, OpenPEPPOL has conducted two surveys; November 24th 2017 – December 8th 2017, and January 15th to January 22nd 2019. Both surveys targeted all members of OpenPEPPOL in the Access Point category. This report presents the results of the 2019 survey.

The purpose of the surveys have been to establish knowledge about integration platforms used by the PEPPOL Access Point providers, as well as their capabilities and plans to implement AS4.

Emphasis was thus on learning more about when they plan to support AS4 and to identify potential drivers to speed up the implementation rate so that the transiton criteria can be met as planned.

3 Main conclusion

The survey shows that 20% of respondents have sent or received messages using AS4 as communication protocol at the time of the survey.

The survey also shows that 47,4% of the remaining respondents plan to support AS4 during the next 6 months, evenly distributed between Q1 (23,7%) and Q2 (23,7%) of 2019. These results indicate that the T3 criteria 4 a) "*Support by commonly used platforms: <…> the majority of platforms in use support both AS2 and AS4"* will be fulfilled during Q2 2019.

[1] https://peppol.eu/as4-now-optional-message-exchange-protocol-in-peppol-edelivery-network/

The survey indicates that the T3 criteria 4 c) "*Production use of AS4 for at least 30% of all transactions in CEF eDelivery integrated with PKI and SMP in the eProcurement domain including pre and post award"* could be fulfilled in Q2 2019.

Chapter 9 of this report and Annex A, the respondents comments to the survey, contains potential measures for OpenPEPPOL and the European Commission to facilitate for an accelerated market adoption of AS4.

4 Software platforms used

The question: "*On which software platform is your PEPPOL Access Point implemented*?" is directly linked to the requirement in the LoU, which aim to identify the integration platforms currently used.
The answers gives an overview of the integration platforms currently in use, and will make it possible to target future activities towards the integration platforms in common use.

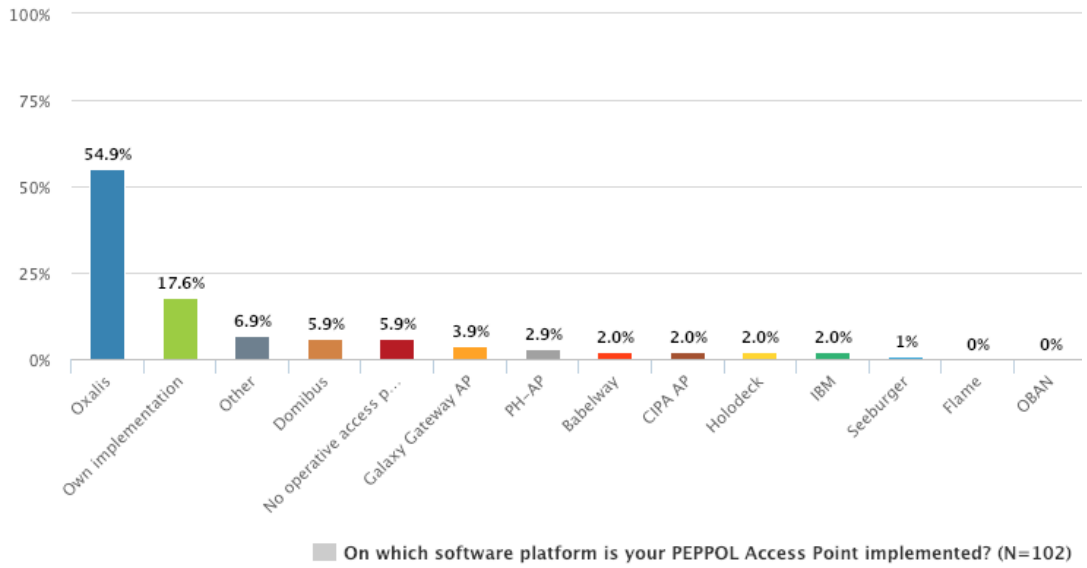


FIGURE 1 - SOFTWARE PLATFORM

The results clearly identify Oxalis as the dominant software platform, with 54,9% of respondents. The previous survey indicated 54,8%.

"Own implementation" represents the second largest user group, with 17,6% of respondents (down from 19,4% in the previous survey). These operators have good potential for managing the future development of their AP software.

"Other" represent the third largest group of respondents, with 6,9% of respondents. This category is comprised of software platforms that were not included in the previous survey; Tradex, OpenTunnel, eessi.as4.net, Phax AS2 and eefacta Server AS4 Gateway.

5,9% of respondents selected "No operative access point", up from 1,6% in the previous survey.

Overall, this survey documents an increase in the number of different software platforms in use. When including the individual platforms given in "Other", this survey reports at least 15 different software platforms, as opposed to the previous survey's 7 – 10 platforms.

NOTE: Individual implementations in the category "Own implementation" have not been counted, the category has been counted as one software platform. Please note that as the respondents differ in their naming pratices, the number of platforms must be seen as a approximation.

5 Annual volume

The question 4: "*Annual volume - approximately how many messages were processed by your PEPPOL Access Point in 2018?*" brings added value to other survey questions, in particular question 5 where the respondent is asked if they have sent or received messages using the AS4 protocol.

The correlation between the respondents reported volume and their planned implementation schedule makes it possible to make predictions on the future timing of T3 criteria fulfilment, as discussed in chapter 6.2.

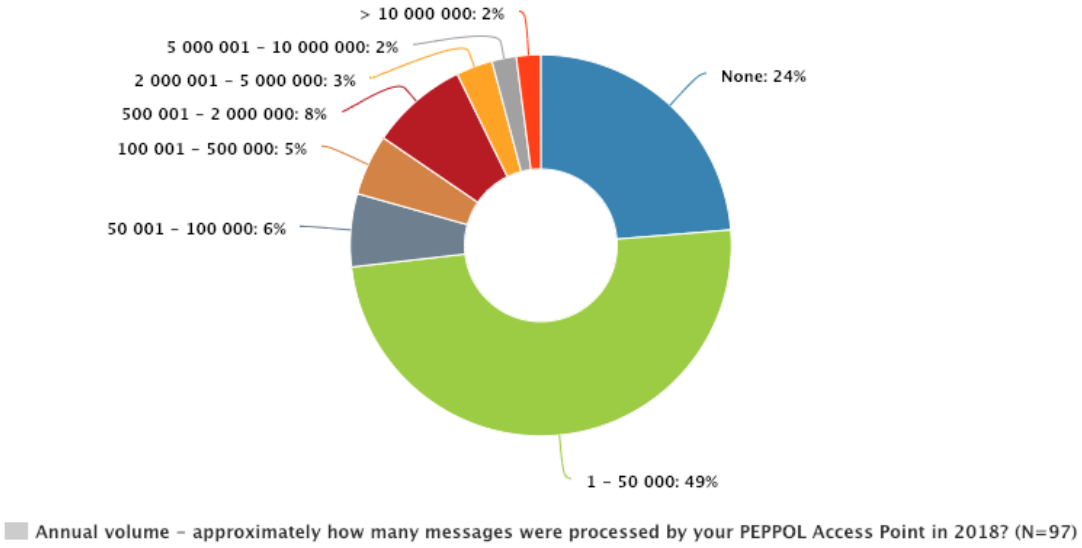


FIGURE 2 - ANNUAL VOLUME

Based on the survey responses and the median values of each volume, the calculated total transaction volume in this survey is 59 900 000 transactions for 2018.

To verify these findings, and to ensure that the respondents with greatest effect on the network transaction volumes have sufficient representation in the survey, the respondents were manually matched with the Norweigian Agency for Public Management and eGovernments (Difi) top 10 access point volume report, as per November 2018[2].
7 of the top 10 access points have submitted their response to this survey, and the volumes they reported in this survey match the volumes presented in Difis volume report per November 2018 for each access point.

The 70% representation of high volume access points in the survey constitutes a slight overrepresentation, which has not been adjusted for in the analyzes.

A small number of the repondents represent a large part of the surveys reported total transaction volume:

- The top 2% of access point operators represent 33% of the total transaction volume in the survey.
- The top 4% of access point operators represents 58% of the total transaction volume in the survey.
- The top 7% of access point operators represent 76% of the total transaction volume in the survey.
- The bottom 59% of access point operators with an operational access point and reported transaction volumes represents 5% of all transactions in the survey.

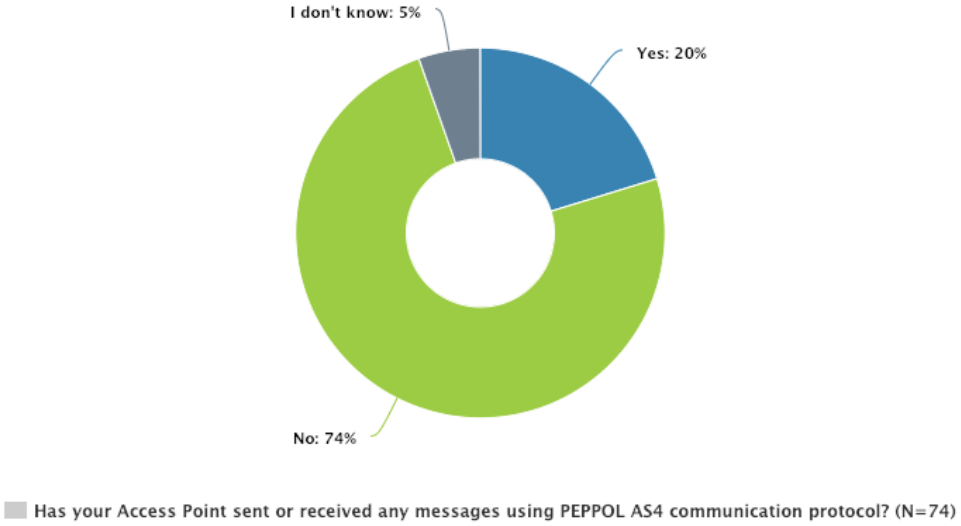
Worth noting is the many members with an operative access point, but no transactions in 2018. Most likely, these are newly established operators, representing growth in the PEPPOL network.

[2] https://www.anskaffelser.no/innkjopsledelse/styringsparametere-og-statistikk/statistikk-om-ehf-og-elma/ehf-faktura-antall-transaksjoner

6 AS4 adoption

The question 5 "*Has your Access Point sent or received any messages using PEPPOL AS4 communication protocol?*" is linked directly to the LoU requirement T3 4 a) "*Support by commonly used platforms: <…> the majority of platforms in use support both AS2 and AS4*, and indirectly to T3 4b) "*Availability of free/affordable AS4 training services, setup and implementation competences at European level and in at least 50% of all Member States and Associated Countries*" and 4e) *"AS2 used for less than 20% of all transactions in the PEPPOL eDelivery network.*"

The response illustrates the current AS4 adoption by the access point members.



NOTE: Only respondents that confirmed that they indeed have an operable access point were presented with this question.

FIGURE 3 - AS4 ADOPTION

The survey shows that 20% of respondents have indeed sent and/or received messages using the AS4 protocol. This is slightly below the predictions from the previous survey, where 27% of access points planned AS4 implementation during 2018.

Worth noting is the 5% that does not know. As the question requires relatively detailed technical knowledge, this number must be considered low.

Half of the respondents that does not know operate their Access Point as a Service (APaaS). The lack of knowledge for this group can be explained by the fact that they are unaware of their service operators detailed technical capabilities. The other half use Oxalis as their platform, as is expected, given Oxalis' distribution between operators.

6.1 AS4 transaction volumes

The LoU transition criteria 4 c) demands "*production use of AS4 for at least 30% of all transactions in CEF eDelivery <…>*".

The 20% of respondents that reported having sent or received messages using the AS4 communication protocol only represents 9% of the total survey transaction volume, as reported in question 4 "*approximately how many messages were processed by your PEPPOL Access Point in 2018?*".

One possible explanation for this disparity may be that these respondents are newly established operators.

It is worth noting that the respondents that chose "*I don´t know*" to question 4 represents 5% of all respondents, and a corresponding 6% of the total transaction volume.

NOTE: To calculate transaction volumes from the volume intervals presented in question 4, the median value for each volume interval has been used.

6.2 Transaction volumes and planned AS4 support

It is not possible to extract transaction volumes directly from the survey results, but it is possible to make predictions based on the survey results.

The graph predicts planned AS4 volumes, by collating the respondents reported transaction volumes (question 4), with their reported plans for implementing AS4 (question 6).

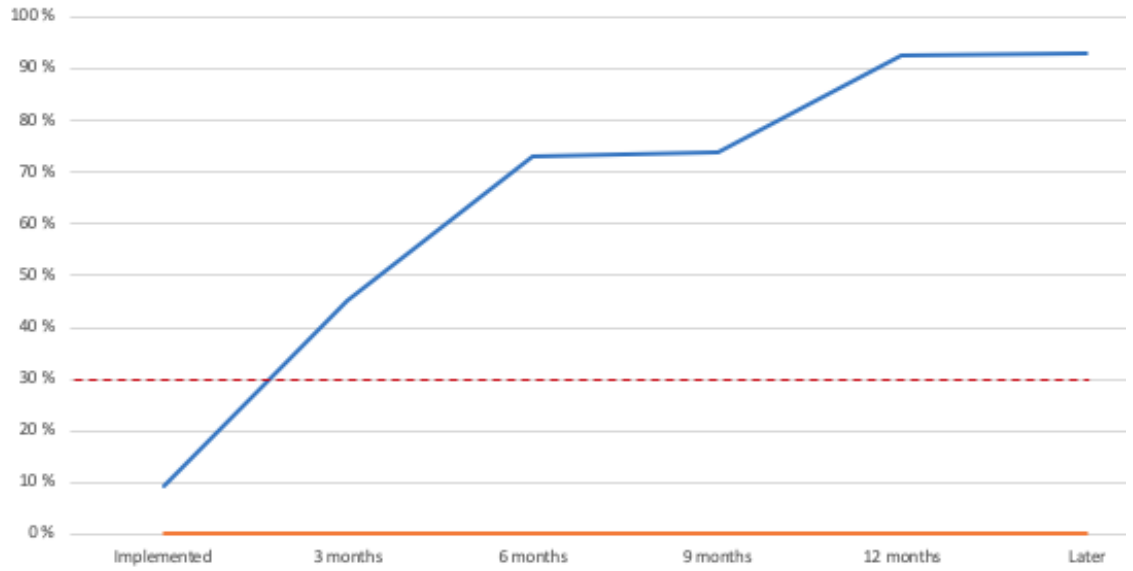


FIGURE 4 - PLANNED AS4 SUPPORT AND VOLUME

On their own, these data points predicts that the T3 criteria 4 c) will be met in Q1 2019. However, the operators will be met with some practical challenges when implementing AS4 that will slow planned volume growth.

Given the operators need to reduce perceived risk when implementing new functionality, it is likely that many will choose to implement AS4 for selected document types or sending/receiving parties until the implementation has proven to be stable in a production environment.

Also, as the use of AS4 as communication protocol requires AS4 capabilities for both corner 2 (sending AP) and corner 3 (receiving AP), the lack of mutual AS4 capabilities between operators will delay the predicted growth in transaction volume during deployment.

Based on these deployment characteristics, it seems probable that T3 criteria 4 c) can be met in Q2 2019.

NOTE: The operators representing the remaining 7% of reported volumes in this survey have submitted “I don’t know” as their answer to question 6. To calculate transaction volumes from the volume intervals listed in question 4, the median value for each interval has been used.

7 Planned AS4 support

The question 6 "*When do you plan to implement support for PEPPOL AS4?*" documents the respondents plans for implementing AS4, and is directly linked to the T3 criteria 4 a).

In addition to providing information about the current situation, the results form a basis for measuring development over time by repeated surveys.

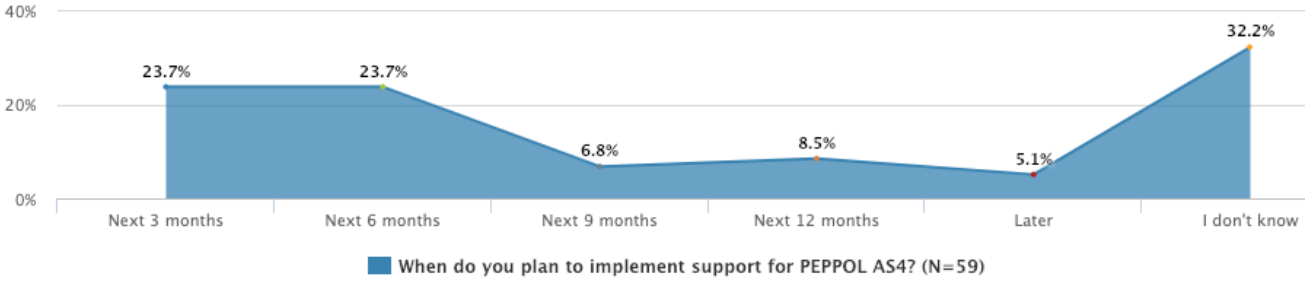


FIGURE 5 - PLANNED AS4 IMPLEMENTATION

NOTE: Only respondents that indicated in the previous question that they had not sent or received messages using the AS4 protocol were presented with this question.

47,4% of the respondents do have plans for implementation of AS4 in the next 6 months, a significant increase from the previous survey, where 14,5% of the respondents planned to support AS4 within in the same time frame.

The previous survey predicted that the T3 criteria 4 a) would be met in Q4 2019, based on the respondents reported plans for AS4 implementation. Results from this survey moves this date closer, indicating that the criteria will be met during Q2 2019.

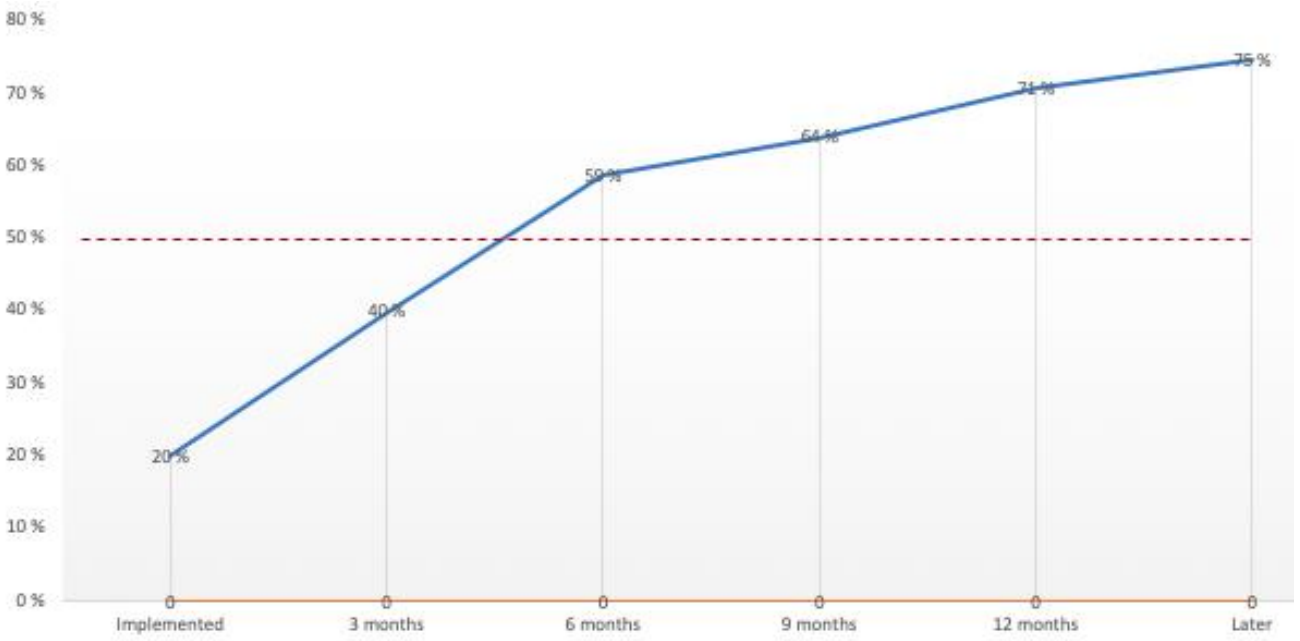


FIGURE 6 - AGGREGATED PLANNED AS4 SUPPORT

NOTE: The basis for the above graph contain some inconsistencies, eg repondents that both indicate having sent AS4 (question 5) and plan to implement AS4 at som later time (question 6). The 25% not represented in the graph have answered "I don't know" to question 6.

7.1 Planned support for AS4 and software platform in use

The survey analyzed the respondents planned AS4 implementation and their software platform.

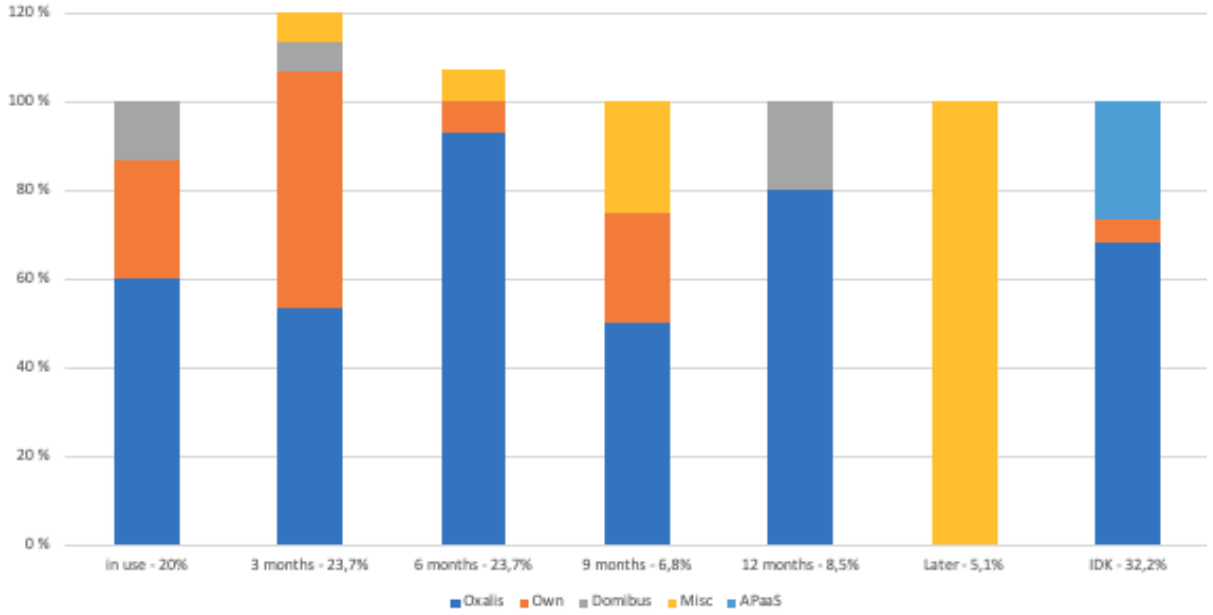


FIGURE 7 - PLANNED AS4 SUPPORT BY SOFTWARE PLATFORM

The previous survey found the respondents planned future AS4 implementations to be mostly unaffected by software platform.

This survey finds that respondents with “Own implementation” are slightly overrepresented in the group that currently supports AS4. These access points operators are also strongly overrepresentated in the group that plans AS4 implementation during the next 3 months. There is reason to believe that these operators have the technical competence and resources necessary for AS4 implementation, an assumption confirmed by the fact that many do have immediate plans for implementation.

Approximately 60% of the respondents that reports to have sent or received AS4 use Oxalis as their software platform, a slight overrepresentation.

Respondents using Oxalis are dominant in the group that plans AS4 implementation during the next 6 months as well as in the group that “don´t know”. As Oxalis software is readily available, widespread and offers a relatively complete installation, one can assume that this software is used by operators with less technical competence and resources, and that these operators to a larger extent rely on what functionality exists in Oxalis at any given time. This user group will benefit from clear, unambiguous communication describing Oxalis’ capabilities.

NOTES:

- The category “Misc” contains a wide selection of software platforms, with no clear emphasis on any particular platform. Software platforms included in this category: CIPA AP, PH-AP, Other, OpenTunnel and eessi.as4.net.
- The category “APaaS” is used as an acronym for Access Point As a Service. This category contains Galaxy Gateway and Babelway.
- Some respondents have selected more than one access point software platform, resulting in varying total number of responses by category, as well as totals that exceed 100% (next 3 months).

8 Supported business process domains

8.1 Planned support for Pre-Award processes

Question 7 "*Pre-award - Please indicate below which of the following PEPPOL BIS-based processes your PEPPOL Access Point has implemented, and which you plan to implement in the future.*"

e-Tendering processes[3] requires the use of AS4, thus any plans by members to support such processes could be a driver for production use of AS4 by existing Access Points.

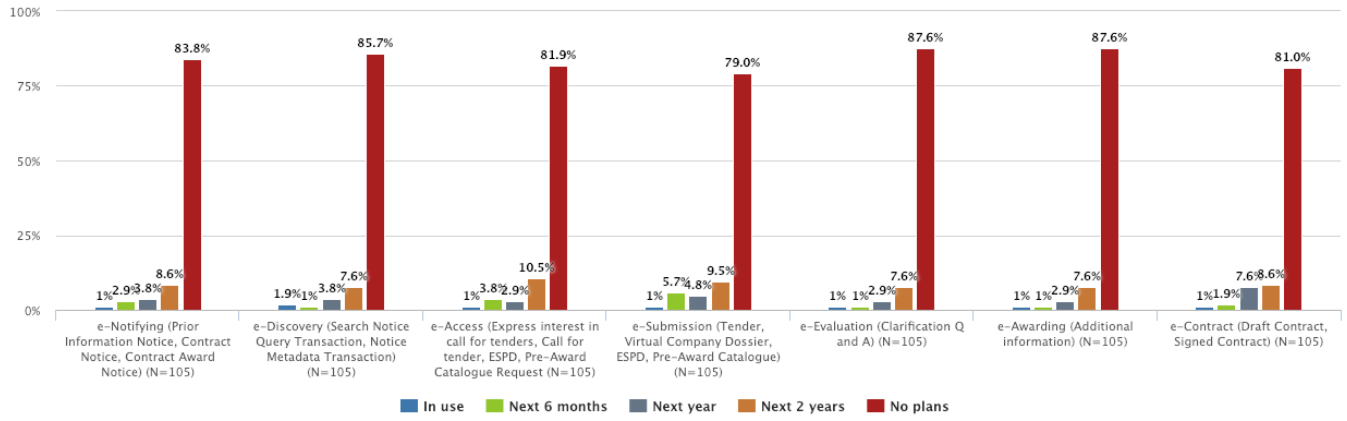


FIGURE 8 - PRE-AWARD, PLANNED SUPPORT

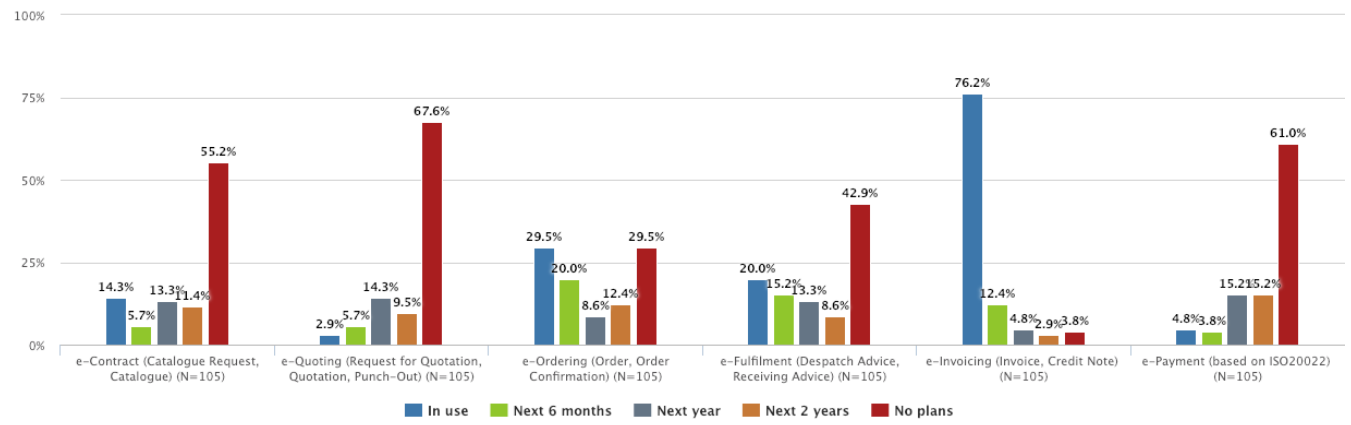
The graphs illustrate the pre-award processes, and the respondents reported plans for support of these processes.

As in the previous survey, planned support for e-Tendering processes by the respondents is very limited.

As a result, the potential for planned implementation of pre-award processes and planned support for AS4 will not be elaborated further in this report.

8.2 Planned support for Post-Award processes

Question 8 "*Post-award - Please indicate below which of the following PEPPOL BIS-based processes your PEPPOL Access Point has implemented, and which you plan to implement in the future.*"



[3] e-Tendering is defined as covering the business areas of e-Access and e-Delivery.

The results illustrate that a majority of respondents support business processes in the Post Award domain.

- 88,6% supports or or have immediate plans for supporting e-Invoicing
- 49,5% supports or or have immediate plans for supporting e-Ordering
- 35,2% supports or or have immediate plans for supporting e-Fulfilment
- 8,6% supports or or have immediate plans for supporting e-Payment instructions based on ISO20022

Generally, these results are somewhat lower than the previous survey for all post-award business processes.

9 Possible measures for accelerating T3 criteria fulfilment

Measures that facilitate or support the access point operators in their implementation and testing activities can contribute to an acceleration of AS4 adoption. One such universal measure is the November 2018 launch of the OpenPEPPOL Centralized Testbed[4].

Oxalis does support AS4 as messaging protocol in its latest release, and Oxalis represents the largest user group with 56% of all respondents. However, Oxalis users are overrepresentated in the group that plans support for AS4 in 6 months, and in the group that doesn't know if or when they plan to support AS4.
Therefore, measures that contributes to accelerate the operators upgrades to Oxalis' final release will have the potential for major impact on the T3 criteria fulfilment.

Measures to accelerate upgrades among Oxalis users include:

- Precise and targeted information about Oxalis releases, capabilities and features. (also mentioned in Annex A – comments from respondents)
- Economic incentives for Oxalis AP Operators to upgrade their Oxalis implementation to the latest release.

Operators using "Own Implementation" are overrepresentated in the group that plans implementation in the next 3 months. To further accelerate AS4 implementation for these operators, measures such as technical support, eg workshops or webinars could prove effective, as these operators will require system adaptions when implementing support for AS4.

[4] https://peppol.eu/launch-openpeppol-centralized-testbed/

Annex A - Comments from respondents

The respondents to the survey were invited to offer comments and further information.
These comments are rendered below, with no editing or structuring other than masking of identifiers:

- *Library support for AS4 (and more generally, for ebMS and SOAP 1.2) is atrocious outside of the Java and .net ecosystems, and this will probably result in many interoperability errors (or worse, a mono-culture of essentially one implementation). The move to a SOAP-based system with ws-security seems like a large step backwards.*
- *Waiting for Oxalis AS4*
- *We strongly advise against the implementation of AS4 at this moment: - We see very limited added business value. - AS2 is broadly accepted and mature, also outside of PEPPOL. AS4 is not. - We have seen a lot of problems with the introduction of AS2 and recently with the migration to certificates V3. We foresee a lot more problems when introducing AS4. Most of the providers are just not mature enough. If possible, we are happy to further discuss this, Kind Regards, xxx yyy@zzz.com*
- *For ordering, fulfilment and invocing Peppol has added value. As for the other e-services I don't see adoption through Peppol in the short term. There is too much variety and difference in maturity to standardise these business processes I think.*
- *We are starting testing with Australian AS4 in the next days*
- *Xxxx is already certified as an AS4 AP -> https://peppol.eu/who-is-who/peppol-certified-aps/*
- *Please release the Detailed Document on the Implementation of AS4.*
- *Would be nice with test access point (participant) with AS4 supported run by OpenPeppol, just like Difi has for (810418052, 'DIFI Test participant').*
- *Peppol has been superseded in the marketplace by technologies that are far easier and less complex to implement. Perhaps instead of focusing on AS4, Peppol should be making it easier to integrate with modern technology providers.*
- *Since we use oxalis, we're unsure when AS4 is supported. Once it's an official release, it will probably take some time before we have installed the release.*
- *It should be possible to indicate within 3 month*
- *This one is not strictly related to the AS4 switch, but we would love to have a quick and efficient way to retrieve other AP's contact points, as the ones that are currently displayed on the "Certified PEPPOL Access Points" page on peppol.eu are not always up to date.*
- *Technically xxx AP support the pre-award document types that doesn't require enhanced security protocol, but we have not focused on this as our ERP-solution doesn't support these messages. Technically we can distribute such messages to any other AP as we are using the Oxalis platform.*
- *These questions were answered by an PEPPOL member, who is only offering software to public Service Providers. And those public Service Providers will host our xxx based implementation.*
- *The August 1, 2019 mandatory deadline to implement AS4 may be a challenge for us to meet given other business priorities.*

Annex B - Respondents and validity

All OpenPEPPOL members in the AP category were invited to the survey. Invitations were distributed to all OpenPEPPOL members in the access point category on January 15th 2019.

Reminders were sent to all inactive respondents on January 17th and January 21st. The survey closed Tuesday January 22nd @ 15:00 CET.

A total of 105 respondents completed the survey. The survey only allowed one answer for each member in the access point category.

70% of the access points representing known, large transaction volumes[5] in OpenPEPPOL official volume statistics submitted their response to the survey. This constitutes a slight overrepresentation. During manual QA of the results, two duplicate responses from repondents in Difis official top 10 volume report were excluded from the analyzes in chapters 4 – 7, as the reported volumes could tilt the survey results.

99 of the 105 respondents indicated that they did have a operative access point at this time. This represents 46% of the 215[6] certified acces points at the time of the survey and 94% of respondents, indicating that members in the access point category without a certified access point generally chose to not answer the survey.

The numbers of respondents that have submitted an answer (N) will vary between questions, as a result of a) not all questions being mandatory, and b) the survey being designed so that respondents are routed past questions that are irrelevant to them.

The statistical power of this survey is dependent on the number of response options per question and the distribution of answers between the response options. We have chosen to disregard these considerations in the analysis, as the sample size of 105 is regarded as sufficient to make generalizations about the population, ie members in the Access point category.

This report contains aggregated answers to individual questions, and do not contain information which can be linked to specific members.

[5] https://www.anskaffelser.no/innkjopsledelse/styringsparametere-og-statistikk/statistikk-om-ehf-og-elma/ehf-faktura-antall-transaksjoner

[6] [6] https://peppol.eu/who-is-who/peppol-certified-aps/