Scan4Transport: Connecting the transport unit to its digital twin

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Abstract

[1] https%(( )) .gs1.org(industries(transport*and*logistics(scan+transport

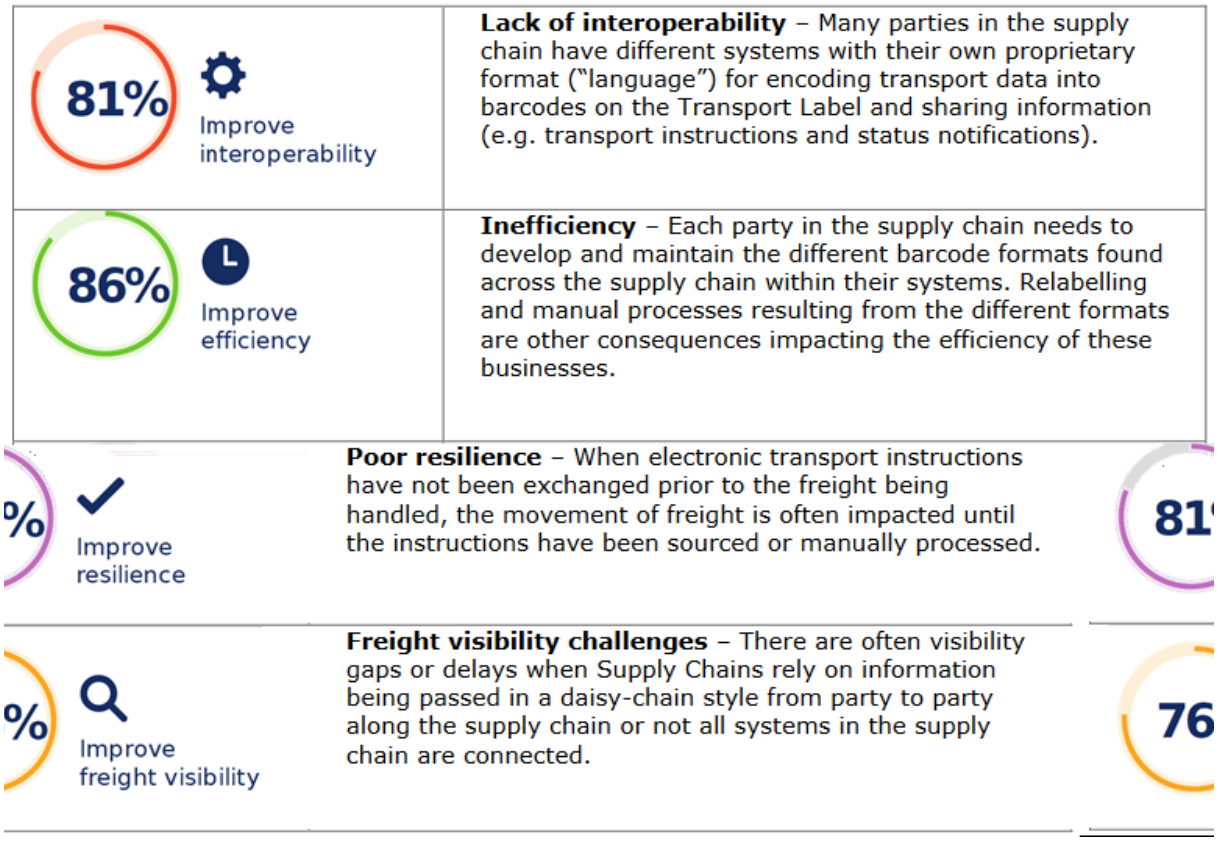
Introduction

Most o, the $usinesses across the suppl- chain use di,,erent s-ste ' s, each) ith their o) n proprietar- standard ./language01 ,or encoding data into $arcodes on the la$els a,,ixed to Transport 2nits and sharing in,or ' ation .e.g. transport instructions and status noti,ications1. "u$se3uentl-, connecting the di,,erent s-ste ' s ./learning and translating the di,,erent languages01 and the cost o, auto ' ating processes to capture data across suppl- chains is o,ten prohi$itive, especiall- ,or s ' all and ' ediu ' si4ed enterprises ."M51. This causes ' anual processes, duplicated e,,ort, cost and ,reight visi$ilit- dela-s(gaps ,or co ' panies across the suppl- chain as ,reight is o,ten handled $- ' ultiple logistic service providers in the journe- ,ro ' "eller to 6u-er.

The transport and logistics industr- has long struggled) ith ensuring that operators out in the ,ield as) ell as those in logistics centers could al) a-s e,,ectivel- and e,,icientl- handle the transport units at hand. Three challenges especiall- ha ' pered the industr-%

1. The Freight Transport 7ndustr- is extre ' el- ,rag ' ented) ith +8,888 Logistic "ervice 9roviders in #ustralia alone and ' illions around the) orld to support the deliver- o, di,,erent t-pes o, ,reight .e.g. $ul:, satchels, parcels, pallets, ugl- ,reight, etc1, to di,,erent locations .e.g. ' etro, regional, interstate, international1, via di,,erent service levels .e.g. standard, overnight, sa ' e da- express, etc1. The industr- has a ver- high proportion o, s ' all and ' ediu ' si4ed ."M51 operators) ith little or no in,or ' ation technolog- capa$ilit-. Larger Logistic "ervice 9roviders .L"91 o,ten rel- on large nu ' $ers o, "M5 ,or last ' ile deliver- or ,irst ' ile collection o, transport units.

. !"1 esti ' ates 1 ' aft.



?ne :e- re3uire ' ent to $e a$le to i ' ple ' ent the 9h-sical 7nternet .971 concepts is that transport units are una ' $iguousl- identi,ia$le and data a$out the transport units is al)a-s availa$le ,or the operator ph-sicall- handling the transport unit at all ti ' es.

7n /traditional0 transport and logistics net)or:s, ' an- transport units do **not** carr- a glo$all- una ' $iguous identi,ier .let alone that it is availa$le in ' achine*reada$le ,or ' at e.g., in a $arcode and(or RF7@ tag1. #s alread- pointed out a$ove, an operator ' a- $e a$le to scan the identi,ier ,ro ' the transport unit, $ut still not $e a$le to do an-thing use,ul)ith it $ecause there is no connection)ith an- host s-ste ' that contains the data related to the transport unit. Ae)ill address that challenge in Chapter 1.

Traditionall-, transport and logistics)or:s $ased on data that is alread- ,ixed(static at the ' o ' ent the sales order $et)een seller and $u-er is ' ade. 5.g., deliver- point is alread- agreed $et)een seller and $u-er then. There is an e ' erging trend that last ' ile deliver- carriers o,,er opportunities to the ,inal recipient to interact)ith the carrier to arrange the /hand*over0 $et)een the carrier and the recipient. 7n general, the seller is not in,or ' ed a$out those arrange ' ents. Ae cover the general topic o, d-na ' ic interaction)ith sta:eholder s-ste ' s in Chapter .

"can+Transport ."+T1 is a glo$al standard ,or encoding transport data in a @ $arcode on a Logistics La$el attached to Transport 2nits o, an- si4e and di ' ensions. The standard supports co ' panies and organisations across the transport process including ,irst ' ile, line haul, sorting processes and last ' ile activities and ena$les the ' to :eep pace)ith the gro)ing needs o, their custo ' ers. The "+T standard $uilds on long*esta$lished and)ell*proven standards ,ro ' 7"?, !"1 and other standardisation $odies.

large group o, sta:eholders ,ro ' diverse $ac:grounds have contri$uted to the develop ' ent o, the "can+Transport standard as)ell as to the i ' ple ' entation o, the standard.

"o ' e o, those are L"9 li:e @>L, Ne) Bealand 9ost, #ustralia 9ost, VT Freight 5xpress, Correios 6ra4il and solution providers Leopard "-ste ' s, #ver- @ennison, "7CC, MixMove as) ell as cargo o) ners e.g., C>59.

The content o, the @ $arcode) hen structured according to the "+T standard ' a- $e generated $- an- sta:eholder and an- other sta:eholder ,ollo) ing the "+T standard can then accuratel- scan and process the contents o, the @ $arcode) ithout an- con,usion a$out interpretation o, an- ele ' ent in the @ $arcode contents.

This achieves the ulti ' ate o$jective de,ined in the 5uropean 7nteropera$ilit- Fra ' e) or: .57F1 o, the 5uropean Co ' ' ission% /5nsure that) hat is sent is) hat is understood0.

1 Making Structured Data available on the Transport Unit

?ne o, the pri ' ar- o$jectives o, the "can+Tranport standard is to ' a:e sure that the operator handling the transport unit al) a-s has at least the ' ini ' u ' data availa$le to execute the next step in the journe- o, the transport unit ,ro ' seller to $u-er. #chieving that $asic o$jective ena$les the ,irst three goals ' entioned in ,igure 1.

The "can+Transport standard ensures access to ' ini ' u ' re3uired data on the transport unit in the ,ollo) ing) a-s%

1. The @ $arcode contains the ' ini ' u ' in,or ' ation availa$le ,or the .,ield1 operator even in case there is no connection) ith a re ' ote host s-ste ' or i, there has $een no prior electronic in,or ' ation exchange related to the transport unit.
   This provides ' uch increased resilience, relia$ilit- and accurac- ,or those operations.
2. The @ $arcode ' a- $e read) ith ' odern standard ' o$ile phones that ' ost(all operators .even the "M51) ill have) ith the ' at all ti ' es. This ' eans that even the least sophisticated operators .in ter ' s o, 7T capa$ilit-1) ill $e a$le to $e included in the in,or ' ation exchange net) or:.
3. The data structures in the @ $arcode are glo$all- standardi4ed independent ,ro ' an- seller, shipper, carrier, $u-er, receiver, logistic service provider or other sta:eholder. There,ore, an- operator) or:ing) ith several(' an- other operators can su,,ice) ith a single application to interpret the @ $arcode and $e a$le to handle the transport unit e,,ectivel- and e,,icientl-.

N?T5% 7n an e*co ' ' erce context, ' an- o, the transport units) ill $e handled(delivered $- so*called designated operators .in plain language% National 9ost organisations1. 9ostal operators deliver ' ore transport units than an- other transport service provider. The- also deliver to less populated areas that other logistic service providers choose not to service. There,ore, it) ould a lot o, sense ,ro ' the 9h-sical 7nternet perspective i, the transport and logistics net) or:s operated $- the @esignated ?perators and other "uppl- Chain and TDL sta:eholders) ould $e ' uch $etter integrated than the- are toda-. 7nteropera$ilit- ' a- $e i ' proved $- ' a:ing the ' ini ' u ' data availa$le in a) ell descri$ed and structured ,or ' at on the transport unit such that even) hen the transport unit changes hands $et) een carriers .$e the- designated operators or non*postal service providers1 the next operator is a$le to handle the transport unit .even i, there is no electronic inter,ace $et) een the ' 1. The 292 .2niversal 9ostal 2nion1 is currentl- going through a process to decide i, .and i, so, ho) 1 the 292) ill ,acilitate $etter integration o, the postal net) or:s) ith the) ider "uppl-

Chain TDL net)or:s. 7t is ,oreseen that the 292)ill 'a:e their decision on their 5xtraordinar- Congress in ?cto$er 8 =.

The sa'ple list o, participants in the develop'ent o, the "+T standard includes organisations that are designated operators as)ell as other L"9. The "+T standard ena$les the' to exchange transport units i, the- so desire. Currentl- not all participants listed exchange transport units)ith all other participants listed.

1.1 What kinds of information can the 2D barcode provide?

1. The glo$all- uni3ue identi,ier ,or the transport unit.
   This is a 'andator- data*ele'ent. Aithout it the "+T standard cannot deliver its ,ull potential.
2. 6asic data a$out the transport unit
   Aeight, di'ensions, volu'e, returna$le asset identi,ier .e.g., ,or roll*cage, pallet or container1 as appropriate.
3. Trade and Transport Re,erence identi,iers
   7denti,ier ,or the Trade Transaction .ship'ent1 and Transport Contract .consign'ent1 as appropriate.
4. "hip*to (Return*to in,or'ation
   "tructured address data, geo*coordinates, identi,ier ,or the ship*to location, contact details as appropriate.
5. >andling instructions
   @angerous !oods ,lag, deliver-)indo), "ignature re3uired as approrpiate.
6. # @igital Lin:.2RL (2R71
   This ena$le the operator to access re'ote in,or'ation in case 7nternet connectivit- is availa$le. Ae)ill cover this in 'ore detail in Chapter .

The list o, data*ele'ents is not exhaustive. 7t 'erel- indicates the in,or'ation that is 'ost co''onl- used in dail- operations in ,reight transport. >ere is an exa'ple o,)hat the content o, the @ $arcode could loo: li:e.

```
/https%((exa'ple.co'(88(=F; 11881881=8881 1G+=88H!"1I#7"6LD+=8 H#venueILo
        uiseI= ED+=8;H6ruxellesD+=8JH65D+ 8H18;8D+8=H1 =< 618 1JC
                                < 68= 8< 61 <86Ds+t0
```

This exa'ple contains .in se3uence1 @igital Lin:, Transport 2nit 7denti,ier, structured deliver- address, and handling instructions. .Ds+t indicates the $arcode content ,ollo)s the "can+Transport standard1.

The data*ele'ents in the @ $arcode are individuall- identi,ia$le $ased on their #pplication 7denti,ier .or #71. #pplication 7denti,iers .or @ata 7denti,iers1 have $een used ,or hal, a centur- in $arcodes to ensure consistent interpretation o, data*ele'ents in $arcodes.

5.g., the transport unit identi,ier highlighted in green consists o, the #7 /880 ,ollo)ed $- the value o, the identi,ier /=F; 11881881=8881 10 .a so*called ""CC or "erial "hipping Container Code co'pliant)ith 7"?(75C 1;+;F*11.

"i'ilarl-, application identi,ier /+=880 indicates the value that ,ollo)s is the na'e o, the "hip*to (@eliver*to organisation,)hereas #7 /+ 80 precedes the postal code o, the "hip*to location. !"1 provides a ver- co'prehensive list o, #pplication 7denti,iers on their)e$site.

The ' ost popular @ $arcode t-pes toda- that ' a- also $e used ,or the "can+Transport approach are%


Data Matrix


QR Code


GS1 DataMatrix


GS1 QR Code

The standard also supports /special0 characters li:e K, L, M, N, 0, P, Σ, Ω as) ell as other Latin and non*Latin characters. This ' eans the "+T standard can $e used in countries all over the) orld.

N?T5% #ccording to /#ddressing the 2naddressed0 there are approci ' atel- one **billion** people in the) orld) ho do not have a /,unctional0 postal address, ' ainl- living in developing countries. 7n addition there are also developed countries) here the addressing s-ste ' s do not provide a ver- precise) a- to ,ind a ph-sical location. 7n rural areas $uildings ' a- $e ' an- ' iles apart. 7n Japan, house($loc:*nu ' $ers on the sa ' e street are not .al) a-s1 in se3uential order .e.g., nu ' $er E ' a- $e in $et) een nu ' $er + and Q1. Ma:ing e,,icient and e,,ective deliveries to locations that do not provide precise positioning in,or ' ation re3uires the use o, geographical coordinates. The "can+Transport standard supports including geocoordinates in the @ $arcode. Modern satellite navigation s-ste ' s .as availa$le on prett- ' uch all ' o$ile phones1 are a$le to use those geocoordinates to direct the ."M51 operator to the right location) ithout ,ail.

1.2 Improving Interoperability

Ahile shippers co ' ' onl- use ; or ' ore Logistic "ervice 9roviders, larger shippers rel- on ;8*188 Logistic "ervice 9roviders to ' eet their transport needs. The nu ' $er o, Logistic "ervice 9roviders explodes) hen the su$contractors involved in the ' ove ' ent o, ,reight are included. These su$contractors are ver- o,ten "M5.

6ecause the data re3uired to e,,ectivel- handle the transport unit is in the @ $arcode on the unit, an operator can get that data ,ro ' the unit) ith a "7N!L5 scan using a "7N!L5 application co ' pletel- independent ,ro ' the sta:eholder that created the @ $arcode in the ,irst place. 7n e,,ect, all sta:eholders capa$le o, generating and(or scanning( ) or:ing) ith the "can+Transport @ $arcode have $eco ' e interopera$le in line) ith the ' ain o$jective o, the 5uropean 7nteropera$ilit- Fra ' e) or:.

Loo:ing at the "M5 operator delivering transport units ,ro ' several large L"9, he can no) use his o) n ' o$ile phone .instead o, several L"9 devices1 **and** the recipient o, the transport units also needs to sign o,, on a "7N!L5 device onl- .the "M5 operators ' o$ile phone1. There,ore, this also has a signi,icant i ' pact on Custo ' er(Consu ' er 5xperience.

Ae need to reiterate here that the vast ' ajorit- o, L"9 are "M5) ho have .ver-1 lo) 7T capa$ilit-. The-) ill ho) ever generall- have ' o$ile phones that are capa$le o, scanning @ $arcodes .at least a RR*code1. The- ' a- install a "7N!L5 application .,ro ' an- solution provider1 that) ill interpret the "can+Transport @ $arcode and present the in,or ' ation to the operator so the operator can e,,ectivel- and correctl- execute the next step in the journe- o, the transport unit ,ro ' "eller to 6u-er.

1.3 Improving Efficiency

>aving the data availa$le on the transport unit in a standardised and ,ull- structured ,or ' at, eli ' inates the need ,or ' anual data capture in those cases) here in,or ' ation is not availa$le ,or the operator. 5li ' ination o, that ' anual) or: .$eing a$le to capture all re3uired data in a single scan1 ensures that the operator can execute his(her transport tas: ' uch ' ore 3uic:l-. 7t also ensures that the data captured is 188< accurate and the operator .and clients and partners1 no longer need to) aste ti ' e on correcting errors due to ' anual data capture. The e,,icienc- ' ani,ests $oth in speed o, execution and reduction o, ti ' e spent on non*value* added activities.

The i ' proved interopera$ilit- ' entioned a$ove also has a signi,icant i ' pact on e,,icienc- .or rather utilisation o, TDL resources1. 6ecause ' ore sta:eholders L"9, "hippers etcetera can) or:) ell) ith ' ore L"9 .even the ver- s ' all ones1 it $eco ' es ,easi$le to consolidate ' ore ,reight ,lo) s) ith a single ."M51 L"9, especiall- in sparsel- populated areas $ut also in ver- densel- and regulated(constricted areas .such as inner cities1. This increases the utilisation o, the transport execution resources in those cases and provides a signi,icant $oost to the e,,icienc- o, those operations. 7n addition, that increased e,,icienc- ' a- reduce undisera$le e,,ects o, transport execution and increase 3ualit- o, living.

2tilisation and e,,icienc- are also increased $ecause the ."M51 operator ' a- use the geocoordinates .i, availa$le in the @ $arcode1 to navigate to the desired location in the 3uic:est) a- and avoiding going to the) rong place(s $e,ore going to the right one .thus ,reeing up ' ore ti ' e ,or other transportation acitivities1.

1.4 Improving Resilience

Fro ' a 9h-sical 7nternet perspective the i ' prove ' ent in resileince .co ' $ined) ith the i ' prove ' ent in interopera$ilit-1 ' a- $e the ' ost interesting aspect o, "can+Transport. Ae alread- indicated that having the ' ini ' u ' data availa$le on the transport unit ' eans that it is not technicall- necessar- to have electronic in,or ' ation exchanges in advance o, the ph-sical hand*over o, the transport unit to a next service provider.

That ' eans that in case o, disruptions in transport and logistics net) or:s, a service provider ' a- decide then and there to engage) ith a service provier .other than the one originall- planned1 to ' a:e sure the transport unit can continue on its journe- to the 6u-er despite the disruption in the net) or:.

7n ,act, the co ' $ination o, resilience and interopera$ilit- ena$les suppl- chain sta:eholders to dela- ' a:ing ,ir ' decisions on ho) exactl- a transport unit ' a- $e transported on the next leg right up to /the last ' inute $e,ore0 the transport unit reall- needs to start on that next leg. #t that point in ti ' e, the sta:eholder ' a- have ' uch ' ore in,or ' ation availa$le regarding the actual ,reight and transport ' ix and) here the individual transport units need to go than) ill $e availa$le in the currentl- custo ' ar- up*,ront planning processes. 6ased on that last ' inute in,or ' ation, the sta:eholder ' a- ' a:e $etter decisions on ho) to route the individual transport units over the various next legs and service providers even) hen there are no disruptions in the TDL net) or:s. Note that this is also exactl- the) a- that routers in the 5lectronic 7nternet route pac:ets through the net) or:.

2 Enabling dynamic interaction with stakeholder systems

The a$ove chapter deals) ith the use cases) here the operator ' a- **not** have access to re ' ote s-ste ' s. 7n this chapter) e) ill cover use cases) here the operator **does** have connectivit-) ith the 7nternet and ' a- access one, several or in principle **any** re ' ote 7T s-ste ' .

There are three logical groups o, 7T s-ste ' s that the operator ' a- connect) ith

1. their o) n$
2. those operated $- the "eller o, the goods contained in the transport unit
3. third part- s-ste ' (s,) hich includes other L"9 s-ste ' s

N?T5% The- ' a- access an- co ' $ination o, these three groups o, s-ste ' s. 5.g., the "M5 operator ' a- **not** have its o) n 7T s-ste ' s, $ut the- ' a-) ant(need to access 7T s-ste ' s o, the "eller and(or the L"9 the- ' a- $e handling the transport unit ,or.

7n the paragraphs $elo)) e) ill dive a little deeper into ho) the "+T standards ena$le these connections.

2.1 Operator accessing own IT system.

For accessing -our o) n s-ste ' s -ou do **not** need to have an- 2RL or 2R7 present in the @ $arcode .-ou :no)) here to access -our o) n s-ste ' 1. 7n general, in this case, the device used $- the operator) ill run its o) n app.lication1.

That app) ill have interpreted the content o, the @ $arcode and used that in,or ' ation) ithin the context o, that app. The app) ill then connect and co ' ' unicate) ith the operators o) n re ' ote 7T s-ste ' s using their o) n proprietar- protocols, ,or ' ats etcetera.

This internal co ' ' unications topic is outside the scope o, this paper.

2.2 Operator accessing the Seller's IT system.

The operator ' a- also need to access the "ellerTs s-ste ' . >ere are a ,e) use cases) here that ' a:es sense%

- The 6u-er has contacted the "eller .e.g., on the "ellers) e$shop1 that the deliver- needs to $e _____ to another .later(earlier1 date and ti ' e $ut still at the sa ' e deliver- location.
- The 6u-er ' a- also _____ o, the deliver-.
- The operator needs to _____ 7T s-ste ' s. This) ill o,ten $e the case) here an "M5 is doing the ulti ' ate deliver- to the 6u-er.

To support all o, these use cases, the seller ' a- create a @ $arcode) ith this sa ' ple content% https%((Transport2nit."eller.co ' (88(=F; 11881881=8881 1G +=88H!"1I#7"6LD+=8 H#venueILouiseI= ED+=8;H6ruxellesD+=8JH65D+ 8H18;8D+ 8=H1 =< 618 1JC< 68= 8< 61 <86Ds+t

The value UTransport2nit."eller.co ' V is ' erel- an illustration o, the purpose o, the 2RL. The "eller) ill have to provide an application on that 2RL that is a$le to interact) ith the transport operator. That application) ill then need to interpret the 88(=F; 11881881=8881 1 part o, the 2RL and /connect0 the ,ront*end application) ith the relevant records in the "ellers $ac:*end 7T s-ste ' s. ?nce that has $een done, the ,ront*end application ' a- o,,er a ' enu o, options via the ,ront*end to the transport service provider. 7t could o,,er to provide the latest deliver- in,or ' ation :no) n to the "eller .e.g., changed dates and(or locations,

contact details and so on1. The "ellers application could also o,,er an option ,or the transport operator to con,ir ' deliver- o, the speci,ic transport unit. This ,eature to $e a$le to easil- connect an- transport or logistic service provider to the "ellers 7T s-ste ' is potentiall- the ' ost po) er,ul aspect o, the "can+Transport to realise the ideas and concepts o, the 9h-sical 7nternet and to put the "eller .o) ner o, the goods in the transport units1 ' ore in control o,) hat happens) ith those goods on their journe- ,ro ' "eller to 6u-er.

2.3 Operator accessing third party IT system.

There are also several use cases) here the operator ' a-) ant or need to access a s-ste ' ,ro ' a third part-. >ere are so ' e exa ' ples%

- The operator needs to _____ 7T s-ste ' s. This) ill o,ten $e the case) here an "M5 is doing the ulti ' ate deliver- to the 6u-er on $ehal, o, a larger L"9) ho operates .advanced1 7T s-ste ' s. This is a co ' ' on use case in the "can+Transport pilots.
- The operator) ants to loo: up opening hours, contact details, geo coordinates or other details related to the location e.g., $ased on the ! lo$al Location Nu ' $er . ! LN1 ,or the "hip*to location1.

7n case the "M5 transport operator needs to con,ir ' deliver- directl- to the large L"9 s-ste ' , the scenario runs ver- ' uch the sa ' e as descri$ed a$ove ,or the "ellers 7T s-ste ' s. >o) ever, the 2RL in the @ $arcode) ould have to point to the application operated $- the large L"9. That L"9 application) ould then o,,er the approiate ,unctionalit- to the "M5 operator .including the option to con,ir ' deliver- and(or exceptions ,or the deliver- e.g., ,ailed deliver-1.

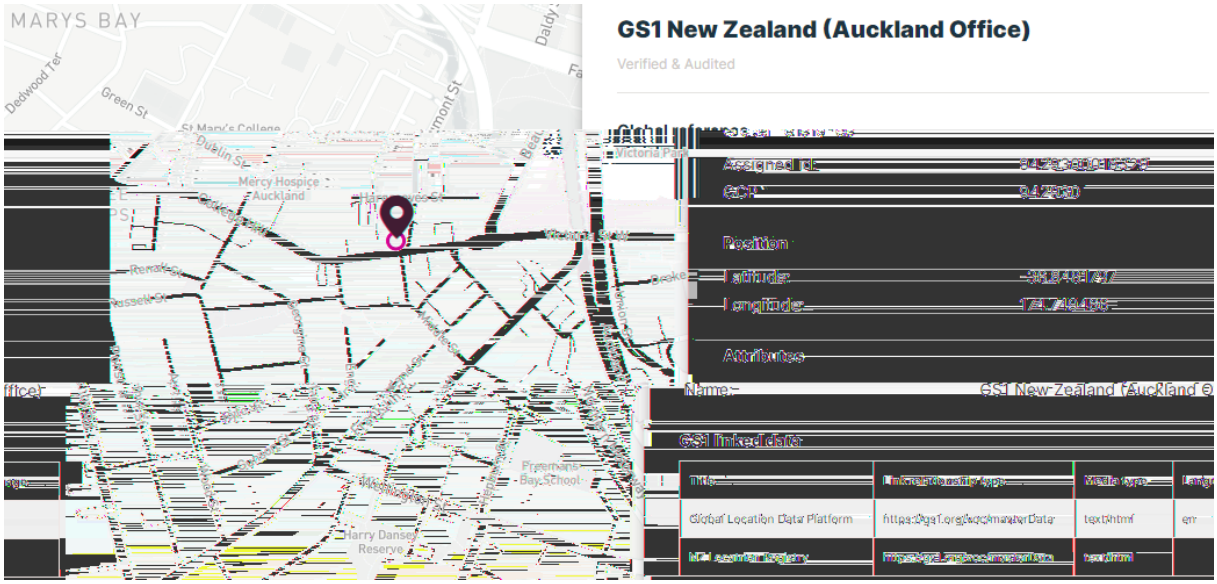
Ae highlighted that a ! LN ,or the location ' a- $e included in the @ $arcode. The application running on the transport operators device .or the Ae$ applications operated $- the "eller or the larger L"91 ' a- use that ! LN to access @ata Lin:ed to the ! LN an-) here on the Ae$. This concept is o,ten re,erred to as /Lin:ed @ata0.

Let's assu ' e a deliver- has to $e ' ade to ! "1 Ne) Bealand #uc:land o,,ice .) hich is identi,ied) ith ! LN H F+ F=8881E= F1. The Ne) Bealand govern ' ent operates a ,ree Ae$* service that) ill provide in,or ' ation a$out Ne) Bealand $usiness and locations $ased on the ! LN. 7n this exa ' ple -ou ' a- directl- acces the location in,or ' ation using the $elo) 2RL https%(( )) .n4$n.govt.n4(' -n4$n(opndetails(F+ F888888888(F+ F=8881E= F(.F+ F888888888 identi,ies ! "1 Ne) Bealand as the organisation associated) ith this location1.

#lternativel- .and even ' ore po) er,ul1, the ! LN ' a- $e used to access Ae$services .e.g., operated $- ! "1 or other parties1 that ' a- $e accessed to ,ind out $asic data a$out the location and ' a- also provide **multiple** di,,erent lin:s to ' ore in,or ' ation .Lin:ed @ata1 ,or the location. 7n the $elo) de ' onstration Ae$*application screenshot -ou see a ' ap o,) here the ! "1 NB o,,ices in #uc:land are .https%(( )) .port ' asterdata.co ' (id(F+ F=8881E= F1.

6otto ' right -ou) ill aso see a ta$le) ith di,,erent Lin:ed @ata targets. The $otto ' one connects directl- to the records ,or ! "1 NB #uc:land in the Ne) Bealand Location Registr-.

These Lin:s To ?ther "ources ?, @ata can alread- $e posted to a glo$al service operated $- ! "1. The- ' a- then $e retrieved $- an- application that can then present the ' to its users .ver- ' uch li:e the de ' onstration application does in the screenshot $elo) 1.



2sing this Lin:s To ?ther "ources ?, @ata .L "@1 approach, an- application that supports the ! LN as location .or organisation1 identi,ier ' a- ' a:e its presence :no) n to the) orld $- posting its L "@ lin:s to the glo$al service. #n- other application ' a- then retrieve those L "@ records to connect to applications that can provide ' ore in,or ' ation a$out the ! LN.

3 In Conclusion

The "can+Transport standard delivers ' an- $ene,its ,or the Transport D Logistics industr- and the reali4ation o, the 9h-sical 7nternet%

- 7 ' proves ,irst and last ' ile processes through the capture o, essential in,or ' ation relating to the transport tas: ,ro ' the $arcode on the transport la$el .e.g.,) hen the ,reight is handled and scanned $e,ore the electronic instructions have $een received1.
- 7 ' proved e,,icienc- and interopera$ilit- across industr- through a standard la$el across the entire suppl- chain. The sa ' e @ $arcode ' a- $e used at an- stage in the journe- o, the transport unit.
- 5nhances deliver- accurac- $- encoding "hip*to ! 5 ? locations .e.g., Construction sites, rural address, gates to ter ' inals (ports (airports,) hich do not have a clear(granular street address1.
- A here connections to the 7nternet are availa$le Lin:s To ?ther "ources ?, @ata ena$le access to the latest in,or ' ation ,or the transport unit e.g., deliver- location or deliver- date and ti ' e ' a- have changed since the transport unit and la$el have $een created. 7t also ena$les that sta:eholders handling the transport units ' a- provide ,eed$ac: into the pri ' ar- source application e.g., con,ir ' ation o, deliver-.

These lead to s ' oother processes and greater custo ' er satis,action.

The results o, the pilot i ' ple ' entations o, "can+Transport standards have $een docu ' ented in a report and a video[=] that are availa$le on the A e$.

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