

IPS Journal



IPS

Journal



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Foreword by Principal Permanent Secretary

Research is an important tool through which ideas and aims are developed, set, and reached, to build a better tomorrow.

The Institute for the Public Services (IPS) is not merely a successor of past set-ups to develop and train the Public Service; it constitutes a powerhouse of ideas, tuned to one objective: that of instigating renewal in the Public Service, moving beyond past practices while preparing for tomorrow's exigencies. Its very name – 'for the Public Services' – is testament to this strategy. In fact, the Public Service is made up of a substantial number of services – some 2,000 in all. The direction this Institute takes must reflect this reality, and endeavour to improve the services provided. This improvement comes about by means of two main elements: people and research. The development and training of people goes hand in hand with research to analyse, get to the root of situations and as a result do things better while doing away with bad habits.

Then there is the IPS itself. This is the result of a strategic partnership with the two main educational institutions of the country – the University of Malta, and the Malta College of Arts, Science and Technology (MCAST). This is a win-win partnership. These two institutions' course content can be positively molded to address Public Service needs and they can, in turn, direct their students to more profitable careers

that are a veritable investment for those who opt for them. The experience needed by IPS to reach the aims for which it was set up emanates from these two institutions.

The research framework within IPS has further scope for growth and I am expecting it to deliver. There is a lot of work that needs to be done on at least two fronts. First, the relevant schemes which students may avail themselves of when following courses related to the Public Service. Second, the course structure itself, which needs to be strengthened further by the allocation of more resources. This year, IPS will publish a study on the renewal carried out by the Public Service – and its impact – in the past seven years. This marks a notable shift not only when it comes to the quality and reach of research itself, but also a commendable step by the Public Service to have acted on the need to take stock of its past achievements, and analyse what worked and what did not reach expectations. Above all, it serves as a founding block to look forward to a more productive future for the Public Service.

This journal marks the first five years from the founding of IPS, and augurs well for the needed consolidation that IPS is embarking on, so that it not only remains relevant, but embeds itself as the backbone of the strategies drawn up for the Public Service. This journal should also show case research carried out, in a bid to stimulate discussion which, in turn, will lead to even more ideas being generated. Above all, it is yet another step IPS has taken to offer opportunities to all those who are ready to take them.

Mario Cutajar

Principal Permanent Secretary and
Cabinet Secretary

Acknowledgments



Editorial Board

Prof. Frank Bezzina PhD
Dr Joyce Cassar PhD
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Mr Adrian Micallef B.Com (Hons), MSc
Mr Roberto Saliba B.Com (Hons), MA

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Contributor Bios

for Academics

Prof. Godfrey Baldacchino

Prof. Godfrey Baldacchino is Professor of Sociology at the University of Malta, and the Deputy Chair of the Sustainable Development Network. This article represents his personal views.

Feedback is welcome at:

godfrey.baldacchino@um.edu.mt

Dr Joshua Ellul

Dr Joshua Ellul is Director of the Centre for Distributed Ledger Technologies, a Senior Lecture in the Department of Computer Science, and also Chairperson of the Malta Digital Innovation Authority. This article represents his personal views.

Feedback is welcome at:

joshua.ellul@um.edu.mt

Prof. Alexiei Dingli

Prof. Alexiei Dingli is a Professor of Artificial Intelligence at the University of Malta. He has been conducting research and working in AI for more than two decades assisting different organisations in implementing AI solutions. His work was rated world-class by international experts and he also won various awards. This article represents his personal views.

Feedback is welcome at:

alexiei.dingli@um.edu.mt

Contributor Bios

for Public Service Officers

Ayfer Aquilina

Ayfer Aquilina has been a public officer for the past 30 years. She was mostly posted within Administrative and Human Resources departments. She has recently graduated with a Bachelor of Arts (Honours) in Public Administration. During her studies, her research focused mainly on sectoral agreements governing public service employees and more recently with the challenging role of female decision makers in Maltese Trade Unionism.

Christabel Attard

Christabel Attard graduated with a Bachelor of Education specialising in Primary and Inclusive Education, followed by a Masters in Responding to Student Diversity and a Masters in Educational Leadership and Management, from the University of Malta. She is an Assistant Head in a primary state school. Ms Attard's main research interests are involving parents in their children's education, as well as including students with specific learning difficulties in the classroom, for a quality education for all.

Margherita Axisa

Margherita Axisa is currently working as Senior Manager at the Ministry for Education. Having graduated with an Executive Master of Business Administration in 2018, her research interests are concerned with the role of human capital investment in the upskilling of the Maltese public service.

Myrna Azzopardi

Myrna Azzopardi graduated with a Doctor of Laws from the University of Malta, followed by a Masters of Laws in International and European Law from the University of Sheffield and an Executive Master of Business Administration in Public Management from the University of Malta. She is currently an Assistant Director within the People Support and Wellbeing Directorate at the People & Standards Division, Office of the Prime Minister. She focuses on legal and research matters relating to people management, conditions of service, industrial relations and discipline, among others.



The Institute for the Public Services seeks to identify and develop the full potential of public officers through research, training, and development.

In today's competitive economic climate, training and development are crucial in addressing the challenges presented, including the need for upskilling the workforce. They are the lifelines which will enhance employee performance and development in the Public Service. Employees can be motivated through

training, resulting in a positive increase in their performance. The Institute for the Public Services (IPS) aligns itself with this ideology and is committed to providing a sustainable service for public officers' training needs to better-adapt to the country's present and emerging demands.



lifelines which will enhance employee performance and development...

Shaping a Public Service culture towards a Service of Excellence

Since October 2016, the IPS has continued to function as a key strategic player, complementing the government's action plan for a Service of Excellence. The IPS equips public officers with the right expertise to remain competitive. It implements a pro-active and comprehensive agenda to attend to the educational and vocational needs required for optimal service delivery within the Public Service. It also acts as a supportive arm of the Public Service by providing continuous professional development and research initiatives, all of which inculcate the Public Service's core values.

To ensure effective implementation and outcomes, the IPS has engaged in a tripartite collaborative venture with its strategic higher education partners, namely the University of Malta (UOM) and the Malta College for Arts, Science and Technology (MCAST). The aim of this collaboration is to continually increase ties among the top educational institutions in Malta for a cohesive approach to the enhancement of the workforce, as well as a targeted response to emerging trends.

Covid-19 Pandemic and its Opportunities

During the unprecedented circumstances which the COVID-19 pandemic instigated, the IPS took up the opportunity to explore virtual learning and continued to deliver its service even during such restrictive times. The IPS approached this challenge as an opportunity to ameliorate its services by making them more accessible, dynamic, and timely. To further support public officers, the IPS made the shift from physical to virtual learning as quickly and as smoothly as possible, so as to ensure that its regular operations kept on running whilst enabling the ongoing training and development of public officers.

Online training is a complex endeavour. Therefore a realistic understanding and clear objectives are necessary. As ideas were pooled and expertise was sought as to which type of training, software, and trainer skills were needed, pre-existing schedules were re-visited, and test courses were rolled out to gauge feasibility and effectiveness. Trainers proved themselves to be flexible, and were eager to embrace this paradigm shift by preparing and adapting course material to suit the new mode of training and learning.

Such unprecedented situations forced the IPS management to shift to a virtual remote working environment. Throughout such period, additional investment was made in IT resources such as the installation of Lecture Capture technology within Training rooms, allowing two-way communication between participants and trainers. Course administration has also taken a more virtual approach, through the implementation of the Training Management System and the provision of certificates (through 'Blockcerts'), further ensuring consistency and efficiency in daily operations.

Furthermore, as part of the Public Service's initiative regarding remote working policies, IPS was entrusted with the design of training for prospective Remote Workers. The main objectives for this training was to provide Public Service officers with the necessary skills to address the new opportunities of remote working, both for employees, and management. Areas of focus include available ICT tools, data protection, ethics for remote workers, as well as a brief session on ergonomics. Management training includes the necessary skills to build and motivate dynamic remote teams.



IPS Story Board

Online Prospectus

In 2020, the IPS launched an interactive website which allows public officers to view the prospectus and to apply for courses online. The prospectus was designed to be user-friendly by adopting an intuitive approach. Every year, the IPS offers courses which have been tailored to bridge the gap between theory and practice. The prospectus is divided into several programmes that target every level within the Public Service. Each programme has its course outline and learning outcomes included to allow public officers to familiarise themselves with the expected content prior to enrolling in their course of choice.

Targeting Industrial Grades

In the past, the IPS prospectus focused mainly on administrative roles. The IPS is now also shifting its focus on training for industrial grades within the Public Service, placing their needs at the core of its strategy and reinforcing the crucial role industrial grades play in delivering a Service of Excellence. Various training programmes have been developed to increase the potential of such grades, with the aim of improving their professional development, programme attainment, performance, as well as increasing motivation.

Recognition for Prior Learning (RPL) Programme

Fully appreciative of the wealth of experience possessed by Public Service officers, the public administration has embarked on a project to provide recognition to the knowledge employees have gained through their work over the years and to provide the

necessary in-house training to top up employees' competencies and enable them to continue to expand their career prospects. For this reason, the IPS has analysed and evaluated a system of prior learning to ensure that officers' knowledge and work experiences are recognised. The Recognition of Prior Learning (RPL) programme began in 2020 as a pilot project, and is envisaged to reap benefits to employees and strengthen the public administration. The experience of Public Service officers was evaluated against varied job descriptions within their respective career paths. Training was subsequently identified to help employees gain the necessary competencies to move forward in their careers and provide the highest level of service to clients of the public administration. All this is being carried out with the support of experts in the various areas to ensure that the RPL is supported by defined criteria and high-level training. The public administration will be extending the RPL to the General Service grades and eventually to other grades as necessary.

The IPS Library

The establishment of a library was another step forward in cultivating the mindset that a Service of Excellence will be attainable only if the Public Service allocates top resources for its public officers. Last year, the IPS launched its first official library within the Public Service. By providing over 1,000 books, reviews, journals, articles, and reports, public officers have been given the opportunity to follow up on their studies with both academic and practical resources. The library also includes online resources and a study area which serves as a networking hub for all public officers.



Sponsorships



I believe that through these courses, the Ministry, as well as the general public, will benefit from public officials who possess further knowledge on the industry they work in and have the qualifications in order to assist the public, as well as strive to offer a good service and be innovative in order to improve the Public Service.

Ms Katrianne Rizzo

BA in Management with Human Resources Management

Ministry for Justice, Equality and Governance

As part of the IPS' commitment to promoting continuous professional development, every year the IPS awards sponsorships to encourage public officers within various sectors to obtain further higher educational qualification at EQF Levels 6 and 7 in public management, procurement and finance, and industrial relations, amongst others.

Collaboration with King's College London

The IPS has signed an agreement with King's College London in order to collaborate in delivering quality training in key areas related to public administration. These accredited modules will supplement learning in specific subjects, addressing skills gaps and help provide the necessary competencies to fulfil roles effectively.

Student Outreach Programme

In 2019, the IPS launched a marketing strategy to entice prospective candidates looking for career paths within the Public Service. This included a trainee programme for students to work with the Public Service in order to gain practical work experience. The IPS now has over 250 trainees engaged on a part-time basis, and over 120 apprentices within the wider Malta public administration.

The Most Beautiful Street

Godfrey Baldacchino

Introduction: beauty contest

Infrastructure Malta is usually associated with the provision of the necessities of mobility and connectivity; and maintaining and enhancing the road network in particular. However, perhaps to inject some colour into the annus horribilis that was 2020, the Agency organised a competition to determine “the most beautiful street” in Malta.

Sanctuary Street, Żabbar, came first: it is a long and straight street, with a mixed use of residential and small-scale commercial, professional and retail services and facilities, and connecting a square at its south end with the Żabbar Parish Church, dedicated to our Lady of Graces, at its north end (this being the Sanctuary after which it is named). Somehow, the street itself makes up for the absence of a church parvis: none is found in Żabbar.

Sanctuary Street has become the main thoroughfare of this bustling town in Malta’s southeast; that honour had belonged to Main Street, which crosses the town west to east, connecting the Cottonera via Żabbar to Żejtun. Triq is-Santwarju beat St Anne Street, Floriana; Anġlu Gatt Street, Żejtun; St Paul Street, Rabat; and Republic Street, Valletta, to secure first place in the 2020 version of this ‘beauty pageant’ (Magri, 2020).

The street, remarkably, still mainly consists of two-storey buildings, with facades boasting traditional stone work, wooden doors, and closed wooden balconies. It is a functional, busy and vibrant thoroughfare, the site of band marches and pilgrimages, with only one-way traffic and one-side parking allowed, given its rather narrow profile.



Street View of Sanctuary Street, Żabbar (Courtesy of Google Maps, 13 December 2020).

I doubt whether this is a coincidence: Sanctuary Street, along with the other top contenders for this unorthodox ‘beauty prize’, has been spared the “uglification” that has gripped various parts of the Maltese Islands (Sciocluna, 2000). At the same time, notice that there are no trees at all on this street: a shocking reminder of how conditioned we Maltese have now become not to expect greenery in our densely peopled and motorised urbanscapes.

I am reminded of another majestic road, one of my favourite choices for sociology fieldwork with my university students, and one that has seen its heyday in another century: I am referring to Victory Street, Senglea. This is a less busy road since, unlike Sanctuary Street, it does not lead to anywhere. It is on this street that Malta’s first ever consumer cooperative

opened its doors, thus reflecting the residential prestige of the locality in those days: the cooperative’s shop was run by the Società Operaia Cattolica on 200-202, Victory Street; in August 1919, it had over 400 consumers as members and employed 30 workers (Malta: Organo del Partito Nazionale, 1920). The topography here is more dramatic: the street is nestled between two hills, each of which is crowned by a church: the Parish Church, dedicated to Our Lady of Victories, close to its south end; and the Jesuit Church, dedicated to St Philip, at its north end. Here, at least, a few trees are to be found. I have counted less than one hundred trees in the whole of Senglea’s public spaces: thirteen of these lie alongside the Parish Church.





Street View of Victory Street, Senglea (Courtesy of Google Maps, 13 December 2020). Note post-war public housing on the right.

A common feature of both streets is that they illustrate the scars of tragedy; but they do so differently. In Senglea, some of the grand properties that housed the local middle class before the 1940s were destroyed by aerial bombardment during the Second World War. Functional but less auspicious and rapidly built buildings, often involving social housing projects launched by the state, have taken their place. In Żabbar, the tragedy that affected Sanctuary Street was the crash of a Royal Air Force Avro Vulcan bomber on October 14th 1975, killing five crew members and one civilian, Vincenzo Zammit. However, mercifully, the 15 houses

rebuilt after this event reflect the architectural form that dominates the streetscape.

Function over form; quality over quantity

Functionality has often trumped form in local contemporary infrastructure design. Even historical monuments, like the Hompesch Arch, the last material legacy of the Knights of St John in Malta, ‘makes sense’ to contemporary Maltese essentially as a traffic island, guiding traffic through a busy junction connecting Fgura, Żabbar, Żejtun and Cottonera (Baldacchino, 2017). Old buildings, it seems, need to have a valid purpose, a

justifiable *raison d’être*: the mere fact that they are old, even if they are beautiful, seems not to suffice to assure their preservation. The economic temptations associated with knocking down the ancient and replacing it with modern apartment blocks are tantamount to irresistible. The unprecedented population growth seen in the Maltese Islands in recent decades is often heralded as the strongest explanatory factor for the ongoing construction activity; that it is an industry which is ‘too big to fail’, so significant is its contribution to the national economy, is another. Surely, taste, quality and aesthetics need not be thrown to the dogs in order to

ascertain more housing stock? Men and women do not live by bread alone; nor do they live only inside their home. A creeping awareness and appreciation of the quality of life, and not just the quantity of life, is a welcome signal of a post-materialist citizenry (after Inglehart, 1981) in the Maltese Islands. Evidence of this is the growing political relevance and clout of environmentalism, at both local and national level (Boissevain, 2004; Boissevain & Gatt, 2011).

Perhaps the competition for the most beautiful street, launched by Infrastructure Malta, taps into, and is part of, the same growing consciousness? The same could be said for the four works of art that are set to adorn the Marsa Flyover Junction (The Malta Independent, 2020). Moreover, a nod in the same direction is made for the 350-metre, vertical 'green wall', with 27,600 odd plants, installed along the Marsa-Hamrun bypass, now absorbing the toxic carbon of fuel gas emissions (Borg, 2020). One can always criticise these initiatives as eyewash – are they just a sop to the environment? That may very well be. And yet, I prefer to laud a good idea when I see one; and expect to see even more.

I am aware that concern for the quality of life is growing. The Maltese population has seen its purchasing power triple in real terms over the past 40 years or so: but, with so much liquidity finding its way into people's pockets so rapidly, the knee-jerk reaction has been conspicuous consumption, and the pursuit of ostentatious materiality: property, vehicles and, more recently, pleasure craft. The traditional parsimony and frugality of the Maltese, and their 'saving for a rainy day' (e.g. Zammit, 1984) has been largely frittered away. However, upcoming generations are more 'post materialist': concerned with the absence of open spaces and green lungs; and disgusted with waste in the guise of plastic bottles or aluminium cans that can be found almost everywhere.

The public sector has responded to this reorientation, with at least three out of twenty Ministries in December 2020 (acronyms: MECP, MESD, MISW) explicitly responsible for sustainable development, quality of life, climate change and environmental protection. These, in turn, are expected to drive initiatives that address this concern and consciousness. A virtuous loop should result.

Meanwhile, the other 17 Ministries can certainly chip in and support this exercise more explicitly. Just like MTIP has done, with considerable publicity, with its art works, green walls, and street beauty contests, even if these are mere sideshows to the main thrust of what this Ministry does (which is, largely, to build and maintain the road network). The justification for this stance is easy: quality of life, like quality control, is not a matter to be relegated and delegated to a specific Ministry or unit. It deserves to be mainstreamed. It is our collective responsibility.

Here's the challenge

There is, of course, already an ongoing effort in Malta to coordinate actions in order to respond to the Agenda 2030 and its 17 Sustainable Development Goals, set by the United Nations, and meant to be achieved by 2030 (United Nations, 2015). A process to craft Malta's Sustainable Development Vision 2050 is underway (Ministry for the Environment, Sustainable Development and Climate Change, 2018). Agencies like the Environment and Resources Authority (ERA) are deeply committed to pursuing a 'sustainable quality of life' agenda, as also expressed in ERA's mission statement (ERA, 2020).



Articles by Academics

I am myself part of the Sustainable Development Network, set up under Act 10 of 2012, to “create a framework through which sustainable development is to be mainstreamed across Government”. And the Government of Malta itself, by virtue of being the government of an EU member state, is tasked to meet the targets of the Annual Sustainable Growth Strategy (Eur-Lex, 2020).

To these efforts, however, can be added a suite of others. Hence, the challenge is set: how can each Ministry, and its line departments, creatively engage in ongoing initiatives that also address the quality of life of the residents of these islands?

To each Ministry, thus, its own set of challenges. Here are a few suggestions, and using a

freewheeling way of thinking that is reminiscent of ‘green hat’ thinking (De Bono, 2017). Some challenges may require cross-Ministry collaboration to succeed. (The initials/acronym of the main relevant Ministry are in brackets: Government of Malta, 2020):

- How to protect Gozo and maintain its complementarity to Malta, putting more flesh and less rhetoric to the Eco Gozo label? (MGOZ).
- How to promote green finance and support the development of green jobs? How to support the growing realisation that one need not commute to work every day but can also work from home, in a hybrid mode? (MFE).
- How to encourage ‘distant viewing’ and ‘augmented reality’ in tourism; with less actual visitations to sensitive sites? Can consumers be more aware of how sustainably manufactured, built or grown are the things that they buy? (MTCP).
- How to look at the hot issue of undocumented migration not simply as a matter of border security and burden sharing; but also as an opportunity for involving local communities in integration initiatives? Would not such actions help reduce misrepresentations of identity, humanise migrants, and develop happier neighbourhoods? (MHSE).
- How to engender more impactful initiatives in favour of alternative means of connectivity? Car-free days or hours, rotating per locality? Reintroduce bus lanes where they already existed, and more to boot? Have walking paths and bicycle lanes that actually do not stop abruptly (forcing one to scratch one’s head and decide what is to be done



create a framework through which sustainable development is to be mainstreamed across Government.

with one's bicycle at that point)? And will there be further incentives to transition to electric vehicles? (MTIP).

- Mainstream sustainable development in the school curriculum? Transform all schools into hotspots of sustainability, with benchmarks fostering some healthy competitive spirit amongst students and educators? (MFED).
- Invest in a more scientific farming sector? Encourage upgrades to crop production and crop cycles that can be supported by organic inputs? Promote drip irrigation and greater technological investment to protect and enhance crop yields? Diversify the seafood industry beyond the farming of tuna, sea bass, sea bream and meagre? (MAFA).
- Develop prototype housing that is energy efficient (and inclusive of rainwater capture mechanisms) and sustainably constructed? (MSA).
- Encourage active ageing, with health and wellness programmes organised at community level, in collaboration with local councils? (MSCA).
- Excluding residential homes and hospitals), which are the healthiest communities in the Maltese Islands? Which is the one with the largest proportion of residents aged 90 and over? Which is the one with the largest fertility rate? (MFH).
- Boost research and innovation in all the above? Encourage all the above by targeted research funding? Especially now that Malta, finally, has its first ever dedicated Ministry for research and innovation. (Let me pose this as a statement, rather than a question.) It is time to really pull up our socks here: in 2018, total expenditure on Research and Development amounted to €74.6 million, or just 0.6 per cent of GDP (National Statistics Office, 2020). (MRIC).

Let us remember also that Malta is a small state. Too many handicaps and deficiencies have been associated with small size, and far too many times. With small size, however, also come some clear advantages: policy measures are typically faster to enact, are national in scope by default, and are quick to show results.





Conclusion

Beauty may be devilishly hard to define: but we all recognise a beautiful thing when we see one. Our small archipelago has a ridiculously high population density: this is, in itself, testimony to its resilient and diversified economy that has weathered many storms (including COVID-19) and now survives and thrives, thanks to inflows of additional imported labour. But the environmental cost is huge. Street beauty pageants are a gentle reminder that our townscapes are not just inevitable collateral damage to progress. They can and should multiply and recur, in myriad creative ways, across multiple Ministries and departments, and with suitable inducements and market signals to stimulate appropriate actions in the private sector, to protect and reward that which we hold dear. Before it is too late.



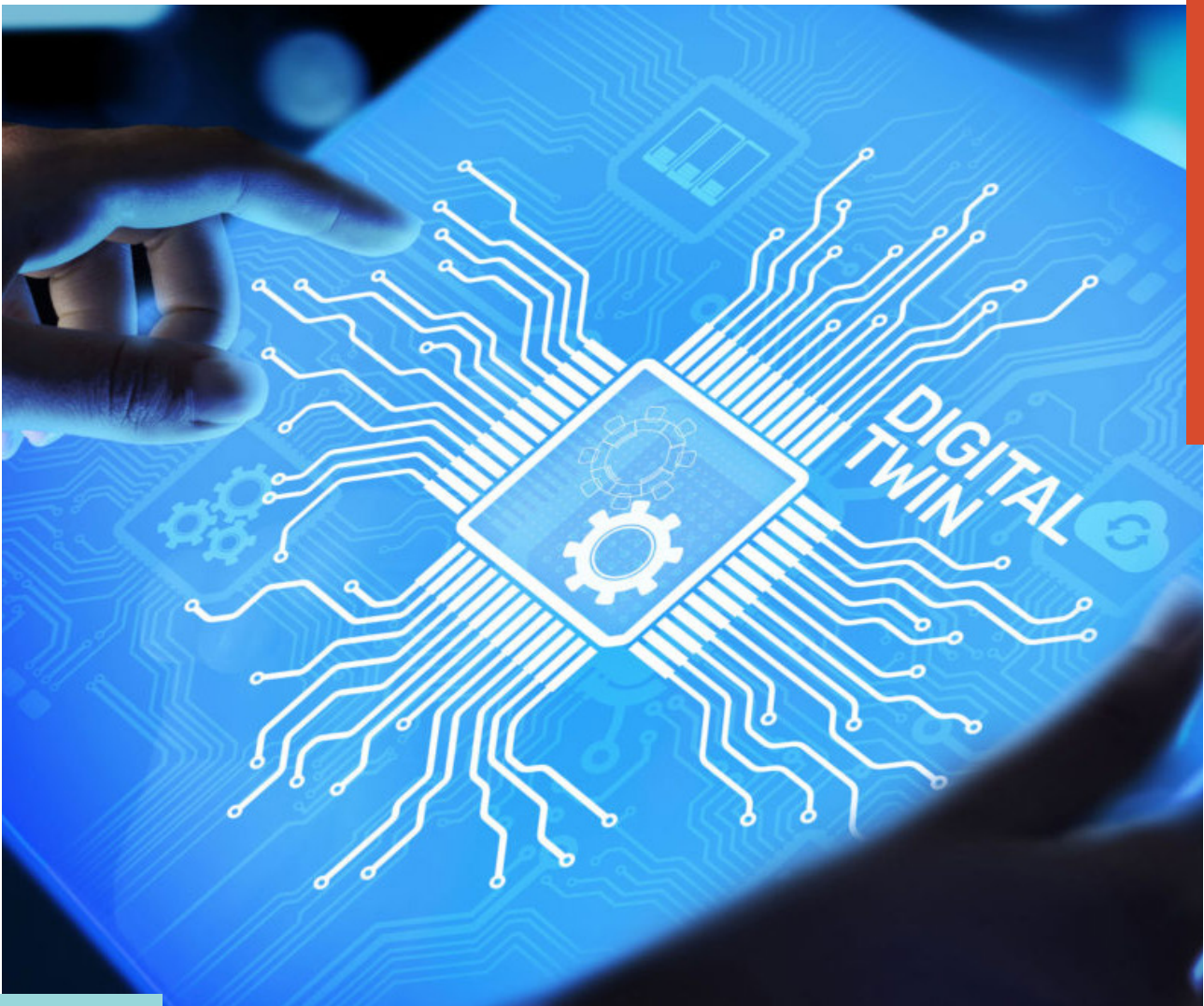
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The Citizen Twin

Designing the future of Public Service
using Artificial Intelligence

Prof. Alexiei Dingli



Introduction

Citizens are overwhelmed with the tsunami of data which engulfs them daily (Bawden and Robinson, 2009; Dingli and Seychell, 2015; Hemp, 2009).

The promises of the information society fizzled out (Halal, 2008), and many organisations struggle to go through with their digital transformation (Barmuta et al., 2020; Gregersen, 2018; Khitskov et al., 2017). The information overload problem people face daily is sowing further confusion while making cooperation between individuals more difficult. In fact, in many cases, rather than lead to constructive dialogue, it is merely polarising opposing views and fuelling further friction (O'Callaghan, 2020; Seargeant and Tagg, 2019; Williams et al., 2015). People today rely on algorithms to view the world, but many find it challenging to build a coherent picture of reality and digest all this information.

The Twins

The need arises to reinvent how Public Service interacts with its clients. The solution to this is in the setting up of a Digital Twin (DT) for people, generally referred to as a Citizen Twin (CT). Let us start by understanding what a DT is.

Digital Twins

A DT is simply a virtual replica of a real system (Fuller et al., 2020). It enables the monitoring (via sensors) and remote control of that entity. Data about the DT is obtained and visualised in real-time. As defined by Boschert and Rosen (2016) a simulation of the various processes within that system is then run to decide which actions will give the best results. Furthermore,



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that information is also essential to make future predictions about the state of the system. By utilising historical data, trends and patterns are extracted and applied to real-time data, allowing the DT to forecast what will happen in the future with a certain degree of accuracy. With this information in hand, the DT can orchestrate (Borodulin et al., 2017) the right processes and execute the correct actions to reach the desired results. Because of this, Datta (2017) deems DTs as being the holy grail of digital transformation.

Even though there's ample literature about DTs, as can be seen in (Dingli et al., 2021; Farsi et al., 2020; Tao et al., 2019) the concept is still in its infancy. Very few applications transitioned from the drawing board to the real world, the bulk of which concealed to manufacturing industries. These implementations within industry come as no surprise since manufacturing plants rely heavily on automation; thus, their data is already available. All they do is get a stream of that data and feed it into the DT for further processing. The DT will then mirror the real device's processing and present it back to the users by

using visual means. Such systems typically rely on animations produced using augmented or virtual reality headsets as specified in Dingli and Haddod (2019), thus offering the user a comprehensive overview of what is happening inside the machine. In other industries, gathering the data necessary for a DT is somewhat more complicated. But a DT goes beyond the possibility of just receiving data from the real object. It needs to have, the option to send data back to the physical machine. If the communication back with the device is not available, it would be presumptuous to call it a DT model. At most, it would be a Digital Shadow as mentioned in Kritzinger et al. (2018) that would still process the data but cannot influence the real-object autonomously. Any interaction between the virtual-object with the real-object would happen with manual intervention. Such an approach defies the scope of having a DT since human mediation tends to be slow and error-prone.

A common issue which arises when dealing with DTs is the amount of data which is required

(Liu et al., 2018). As mentioned earlier, the world is facing an information overload epidemic. Computers can handle much more data than humans; however, one cannot pump large volumes of data and expect the DT to manage it. The transfer of information between different systems is still a significant bottleneck even though clouds or data-lake infrastructures (Malysiak-Mrozek et al., 2018) handle the storage. Furthermore, more data is not always better, and in some cases, it merely adds noise, thus causing more problems than it solves. Therefore, when dealing with a DT system, it is recommended that processes only store the required information or that which might be useful in future applications.

To summarise, a DT is nothing more than a virtual mirror of an actual physical process that uses the data generated by the process, analyse it, and sends back instructions. This approach enables much more efficient and effective use of the underlying data, which encourages further automation. Ultimately, such systems aim to automate the management part to optimise these processes.



Citizen Twins

A CT is a DT which is mirroring a real person rather than a machine as defined by Gartner (2020).

Its fundamental component is a repository that holds all the public data (stored by the government) about an individual throughout their lifetime. This approach is a significant shift in mentality to what is currently in use. Today's most popular strategy involves having public entities, each with a separate database (or group of databases) distinct from others (Aaker, 2008; Rasmussen Pennington and Cagnazzo, 2019). With such a system, different entities hold fragments of the personal data of an individual. Governments have been trying to get these entities to share their data for decades. The latest push sees the implementation of the "once-only principle" (Kalvet et al., 2018; Krimmer et al., 2017; Wimmer et al., 2017) which is an e-government concept to get citizens and companies to provide standard information



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to the government only once. Of course, it is easier said than done. Legacy systems rely on different databases, using various formats and following conflicting conventions. The biggest problem with such systems is that since the databases contain data collected during different periods, there might be inconsistencies amongst the repositories (Eiter et al., 2014). Furthermore, it is probably difficult for the government to get a comprehensive yet coherent picture of each client since many of these systems do not communicate with each other, and there is nothing that aggregates the information.

With a CT, the government would have a single repository for every individual. This approach automatically eliminates issues of inconsistencies amongst databases. It will also solve any incompatibilities since the CT will act as the *lingua franca* of government. Legacy databases will be a thing of the past and the headaches associated with maintaining them and ensuring that the right expertise is available would diminish. Let's not forget that the world already passed through such an issue a few years before the end of the last Millennium. At the time, experts predicted that the world's legacy systems were prone to the Millennium or Y2K (the Year 2000) bug (Kratofil and Burbank, 1999). The bug has its origins soon after the Second World War when computer memory was scarce and expensive. To be economical, computer programmers started writing a date using two digits to represent the year. Of course, this would create havoc at the turn of the century since a record entered on 1st January 2000 would appear before one inserted on the 31st December 1999. Luckily, careful planning averted the global disaster. However, the search for COBOL programmers to fix the legacy

systems was a real feat. Hence why governments should do their utmost to move away from such legacy systems.

Once the CT is in place, different entities will have different data viewpoints on a need-to-know basis. For instance the tax department will see different aspects of the CT than the, say, licensing department (which would also fall under separate ministries). However, if the compliance department wants to check whether the licensed individual is paying their taxes according to predefined analytics, the compliance department would view the data accessed by both the tax and licensing departments.

But a CT is much more than a glorified database. The data warehouse is just one of the foundation stones to create such a system. Let's not forget that a significant challenge with data is the quantity. According to Margetts and Dorobantu (2019) people generate massive amounts of information daily through their mobile devices (computer, laptop, tablet or smartwatch, to name a few). We estimate it amounts to around 2.5 quintillion bytes data per day. Thus it is not surprising that in the past two years, we created 90% of all the data in the world. When one considers that governments are placing the Internet of Things (IoT) sensors everywhere (AlEnezi et al., 2018; Kankanhalli et al., 2019) (such as access cards, smart lamps or cameras), this number will increase drastically. A robust data warehouse needs to handle all this data volume and connect the different data snippets almost in real-time.

Since one of the CT's goals is to help every person lead an enjoyable life, it will also change how we communicate with the government. The system acts



as a mediator between the virtual world and the physical space. People should not access digital services just through their digital window (such as a mobile phone, tablet or computer screen) but through the introduction of more natural interfaces (such as speech (Wijeratne et al., 2019). Sensors, located nationwide, will become their extended feelers which will feed information into a network of distributed databases. The big data collected is then analysed using advanced AI algorithms and fed back to people in various



...now everything is shifting online.

forms. Whereas before, most of the connections were physical, now everything is shifting online. Thanks to the IoT, there is little distinction between physical or virtual objects. It provides AI with an extended view, beyond the online world and encroaching into the physical world. If a person is waiting at a bus stop, the CT will automatically communicate with his mobile device and push real-time bus scheduling information. The physical context becomes a trigger to the data which the individual needs. In so doing, AI can then assist the people in their daily lives. Thus, this process brings new value to society in ways not previously possible.

This reality comes at-a-time when life is becoming prosperous (Kohli and Agarwala, 2017), so the demand for food and energy is

rising, lifespan is increasing, and society is advancing. Apart from this, international competition is becoming fierce thanks to globalisation (O'Sullivan, 2019). As a result of this fast-moving world, inequalities are multiplying, generating more social problems (Bauman, 2011) Countries are also facing new challenges such as reducing greenhouse gases, increasing food production to satisfy demand, redistribution of wealth, promoting the circular economy and managing the ageing society to name a few. Nations can only tackle these challenges with AI and a combination of advanced technologies such as IoT, Robotics, 5G and Big Data.





The need for such a system became evident during the pandemic when governments launched apps (Trang et al., 2020) to help people sustain social distance and facilitate contact tracing. The next stage in the evolution of these systems is creating health passports (Brown et al., 2020) intended to keep a record of who was vaccinated and provide access to public places (such as restaurants, shops and public transport to name a few).

But the idea of CT goes much further. The data is harvested from different data sources and amalgamated to create digital personas. When dealing with personal data, privacy can be a big issue. Thus, all the data is stored either in their device or on their cloud account. The AI algorithms will then use federated learning techniques (Li et al., 2020) that access the device, learn the trends, and upload only anonymised data to the central server. Users can also opt not to allow the federated learning algorithms to access their data. Such a system will ensure that data usage is both ethical and secure.

The CT can hold information about anything, from interactions with government agencies, work-related information, health diagnostics from wearable devices, and even shopping patterns. The system will also ensure that the profiles are up to date in real-time. This data fusion will eventually open new opportunities for both public, and private organisations.

Case Studies

There are many things which a CT can do, but it can focus on two aspects: first of all, it will ensure that all citizens get the most out of the government services available. Second, it will predict which services will be needed in the future, thus allowing the government to plan and offer those services to the individual when needed. The following are some examples:

Remote Monitoring

The ageing population is rising every year (He et al., 2016), and most governments are under pressure to provide more institutional care. But such care is very costly (Kitchener, 2006), and most of the time, the demand is much bigger than the supply, thus leaving vulnerable people without adequate supervision. Furthermore according to Challis et al., (2001), it is a known fact that people prefer to keep on living in their community rather than being uprooted and placed in an alien environment.

To solve this issue, a CT is used to provide Ambient Assisted Living (AAL) services (Marques, 2019) in their own homes. AAL makes use of technology in a person's daily life to help them live independently. Several AAL devices have been designed and developed, based on sensors, microphones and vision systems with quite promising results. However, for the field to reach maturity, many challenges need to be

tackled, including developing robust processes in the real-world that are easy to use and accepted by the society, users and carers. Various AAL products are available on the market, and these provide elderly and vulnerable people with a better lifestyle and a secure environment. As outlined by the EU Commission (Van Grootven and van Achterberg, 2019) we can define stakeholders' needs in the following categories; AAL for persons (home and mobile), AAL in community and AAL at work. The technologies on which the applications and functionalities rely on are;

- **Sensing** – exist in almost all AAL applications from wearable products to sensors built in the environment (such as home, vehicles and public areas).
- **Reasoning** – knowledge about the user's daily activities or an abnormal activity such as an emergency.
- **Acting** – can be considered as the services that proactively act to monitor the assisted environment.
- **Interacting** – Intelligent interfaces supported by networks and computers that will be surrounding humans or machines.
- **Communicating** – AAL systems can also communicate with each other using centralised services.



AAL technologies include a wide range of devices (Benetazzo et al., 2015) such as home embedded sensors and networks, body-worn sensors, robots and implants.



...elderly living in the community experience at least one fall yearly...

The industry recently showed a growing interest in computer vision-based solutions (such as Dingli et al., 2012; Dingli et al., 2013; Dingli and Seychell, 2014) because these products are offering much more affordable solutions. A significant risk faced by older people is accidental falls. According to Zecevic et al. (2006), a suitable definition of a fall is “Unintentionally coming to the ground or some lower level and other than as a consequence of sustaining a violent blow, loss of consciousness, sudden onset of paralysis as in stroke or an epileptic seizure”. Walker and Howland (1991) estimate that about one-third of the elderly living in the community experience at least one fall yearly and this goes up to 30% for people aged 65 or older.

Loss of consciousness before or as a result of a fall can lead to difficulty where a person remains lying down until someone notices the accident or until the person regains consciousness. This situation could lead to problems if the person involved suffered injuries and cannot move. Calling for help or trying to get up can be critical. Non-intrusive sensors that monitor the person’s movement and actions can avoid such situations. Standard camera feeds monitored by an AI system like that developed by Gatt et al. (2019) can follow a person throughout their home. They can perform skeletal detection¹ and through it, infer what the person is doing. Thus, if the system detects a person lying on the floor during the night, it will first try to interact with him via voice. If the person does not answer back, it will then raise the alarm to his next-of-kin or the relevant authorities. The entire process is performed automatically by an AI, and there are no humans involved, thus guaranteeing the individual’s privacy. Apart from emergency issues, the CT can also handle mundane things like prompting the person to take their pills (Yugandhar and Jayanthi, 2020) or even create geofences (Wan et al., 2015) in cases where the illness requires them to stay home.

¹ Skeletal detection is a digital estimation of the person’s skeleton.



Optimisation

Governments are continually coming up with initiatives to help their citizens. They do so with the best intentions, but the schemes are not always successful (Cerqua and Pellegrini, 2018). The reasons are varied; it might be that the targeted audience is not interested. Maybe the burden to apply is too complicated. It could also be that the people are interested, but their current situation impedes them from considering it. The reasons are various, and it is not always easy to understand them in advance.

A CT would help in such a situation because it can calculate uptake and

account for the entire population. An analysis of previous schemes will help the CT determine what works and what doesn't with different cohorts. It will then direct policymakers towards learning from past mistakes and help them develop successful initiatives.

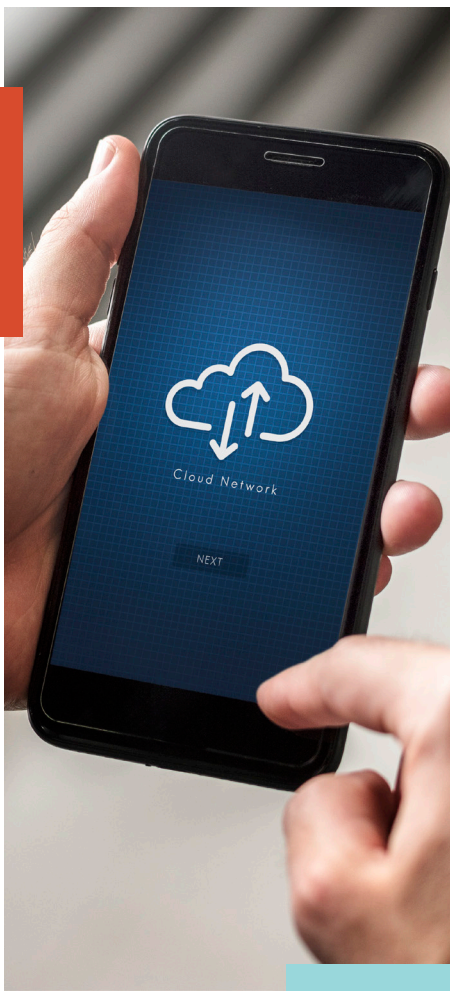
The CT even goes further by proposing new initiatives. It combines data from different departments and uses it during the different phases of the product life cycle. In this way, simulations are run at all stages to achieve an optimum approach. The basic architecture analyses historical and

real-time data using algorithms. When new data streams become available, they are inserted into the system, and the CT uses them. We can consider this approach as being a constant evolution of the processes. It not only helps in the creation of better initiatives but also cuts the time involved. Of the extensive repositories of data available, only those considered essential are used. Thus, the CT is a lean model which increases the overall efficiency of the entire process.



Future Predictions

CTs are data-hungry, and if they have enough information, they can manage to elicit patterns and make accurate predictions.



These predictions are critical not just for the individual but also for the state. Let's have a look at the following examples:

- If we look at screening programmes currently in use, most of them utilise statistical analysis. Take breast cancer (Dilaveri et al., 2019); screening involves all women after the age of 40. But a CT can be much more precise than that (McKinney et al, 2020); it can record if the person is physically active, overweight, drink alcohol, their reproduction history, and so much more. If these factors are combined, the CT can predict whether that person is more prone to develop breast cancer and, in that case, refer it for testing.
- A CT can easily combine data analytics, machine learning and AI (such as that developed by de Roux et al. (2018)) to predict payment irregularities and tax fraud before they happen. The state can quickly identify which person risks a tax payment default and launch assistance programmes ahead of time. These programmes will then help people with their fiscal responsibility while predicting an accurate income estimate for the state.
- Some countries tag their offenders under house arrest with electronic bracelets such as those mentioned in Díaz et al. (2019). These people are not expected to stay home but have minimal mobility and well-defined time windows. The CT creates a geofence for them and raises an alert if they venture beyond their restricted zone. However, it can do much more; it can calculate the probability of meeting a past victim. If a person accused of domestic violence walks close to his partner's house, then the likelihood of relapsing increases. To avoid such situations, the CT will direct the person towards choosing an alternate route, thus helping him throughout his reformation process.

Jigsaw Puzzle

A problem with today's approach is that due to various constraints, adequate planning is sometimes given less importance. Unfortunately, some administrations tend to go for quick fixes while missing long term solutions. We can easily experience it in urban planning (Johnson, 2001; Kaker et al., 2020), whereby districts or entire cities emerge from the expansion of previous settlements. Of course, once they grow, it is difficult to solve some of the issues that arise due to their development. A CT can be of immense help in this process. First, it will provide valuable information about the citizens within a particular locality. It can determine how people commute throughout the day, from where they buy their daily needs and where they go enjoy themselves. Second, it will use AI to propose potential solutions tested using simulations. AI might suggest some of the following:

- Some roads might change direction during certain hours.
- Localities can consider installing tidal lanes to ease traffic during rush hours.
- The switching of traffic lights might change during the day to reduce traffic.
- Municipalities might construct new parks or commercial entities to attract traffic towards other parts of the city.
- They can discourage the construction of residential zones in one area while promoting them in others.

Finally, policymakers can change bits and pieces of the proposed solution as if they're constructing a complex jigsaw puzzle under the guidance of the CT while keeping in mind the city's long-term objectives.

Of course, this is just considering normal circumstances. If the city won the right to host a major event, a multi-year project to build all the facilities would be underway. Using machine learning models, urban planners can investigate the future and understand how the city will evolve. The CT will not only show the current data, but it will make predictions about its citizens:

- The number of children born in the future and the services they would need.
- The people who will migrate to and from the city while mapping the changing demographics of the zones.
- The increase in the ageing population and the services they would require.
- Many other scenarios.

By looking at these predictions, the CT can understand the change in traffic, how to manage new traffic flows by designing new routes leading to and from mass venues and where to boost public transportation amongst others.



Asset Management

Any government is asset rich and managing all of the items is a big headache, especially in large dispersed areas (Misnan et al., 2012; Musa, 2015) Some of them are huge (like buildings), others reside in them (such as computers or furniture) while many of them are located outside (like street furniture, vehicles or sensors). It is impossible to manage them all coherently!

Thus, predictions become even more valuable, especially when managing parts for defective components or planning future initiatives. AI can be used to sift through online stores, estimate the cost of parts (while considering delivery dates plus other variables) and predict the total cost of ownership.

A unique identifier is inserted in most components for tracking purpose. Some of them will be tagged using technologies (such as Radio Frequency IDs (Shamsi et al., 2015)), which seamlessly provide information to the central system regarding objects' movement in the real world. Thus, with the click-of-a-button, the person managing the system will have an up-to-date overview of all the physical assets available at any one point in time. It will also provide additional details about the products on order or those in transit. Furthermore, if the tracking module uses a

blockchain system, one can ensure full traceability for any product (Xu et al., 2019); starting from the raw materials that make up the product, up to the end of the product's lifecycle, the recycling stage.

All of this is important to provide a safe environment for our CTs. People interact with all sorts of government possessions. They use roads, walk on pavements, interact with automated kiosks and use public transport, to name but a few. However, their connection with the central government is set to increase in the coming years. If we take self-driving vehicles as an example, these must read road signage (Fathy et al., 2020). Thus, it is no longer acceptable to have a sign hidden by a tree or a road marking which has faded. The general infrastructure of the country must be impeccable if we want to make this new leap.



A unique identifier is inserted in most components tracking purpose.



Decision-Making

The CT system assists policymakers in providing timely information, in the sifting through the sea of data and in the creation of summarised viewpoints over the various processes. Without doubt, they will become the personal assistants of ministers and departmental heads (Chin, 2016) capable of giving accurate snapshots and highlighting areas of concern in real-time.

Furthermore, the time will come when part of the administration will be entirely entrusted in the AI system's hands, thus automating run-of-the-mill decision-making processes. The CT will take decisions at the lightning speed, and it will dispatch corrective actions as soon as they are needed.

Let's consider the case where there's an emergency, such as a traffic accident. The CT is already aware that the accident happened through the road network camera system, which is in place. Modern cars will have an internal diagnostics system that automatically determines the extent of the damage suffered and the passengers' situation. Since they are connected vehicles, they relay the accident report to the centralised Intelligent Transportation System (ITS). The ITS would have already created a hypothesis of what happened and validates it with the cars'

statement. It then summons one or more ambulances to the scene. Considering that the passengers' identity is known, it can inform the paramedics about the people involved and highlights relevant aspects of their medical history. The ambulance receives the directions consisting of the timeliest route (which avoids traffic). Since time is critical, the ITS will guide all the connected vehicles along the way (or those that will cross path with the ambulance at a future time) towards an alternative route. The system then sends several instructions to tackle the remaining situation; a tow truck clears the cars from the road, the local authorities remove any debris, and the police maintain public order. The final task is to send the relevant information to the insurance companies and the accident report to the AI judge for evaluation. All this coordination is done in less than a minute.

As evident in the previous example, administrators will be relieved from day-to-day micromanagement; they can look at their operations from the macro perspective and spend more time planning future improvements.



Conclusion

There is no doubt that CTs are the future of Public Service. Of course, there are still various issues to consider. One of these is without doubt, privacy. However, the individual's data does not need to leave the person's device, but it can still contribute to the centralised system.

The only requirement of such a system is that people install an app on their mobile device. Traditional services like localisation, social media, chats, e-wallets and others will all be available. However, rather than having a centralised server as it is the case today, the user's phone stores all the personal information. The user will have full access to the data, and they can choose to retain or delete it. Furthermore, the system will use two AI components, one located remotely and the other on the device itself.

If we consider an e-Wallet, the first advantage is that payments occur using contactless virtual cards and without exchanging real money, thus moving towards a cashless society. The e-wallet also includes information about shops visited together with the purchases. The system stores the location of the shop and logs the time in the user's device. From the purchases, the local AI can gather information regarding the wellbeing of the individual. It can easily infer that if certain items (such as medicines) are purchased, then the person or someone close to them is most probably ill. The local AI can also start a chat with the user, inquire about this, and inform the user if a particular medicine falls within a government scheme for which they're eligible. The important thing is that the choice remains in the users' hands, and no information gets shared with any department. Such an AI system is possible because today, we have AI engines that efficiently work on a mobile device without communicating with a server such as those developed by Shuan-feng (2020) or Warden and

Situnayake (2019). If the user requires specific medical assistance, it can connect them directly with the appropriate health provider, thus solving the various queries which the person might have. There are also some countries where they're using an app to perform Emergency Triage on their mobile phone (Wiktor et al., 2018) thus managing patients effectively.

The localisation module provides precise information regarding the person's whereabouts (within an error of a few meters). Of course, this information is only stored on the device and not shared with anyone. Systems can use this information without revealing the user's identity through a novel AI approach called federated learning (Li et al., 2020). The system works as follows; the device downloads the AI model from the server and enhances it locally by learning from the phone's data. A summary of the new model is created and uploaded to the cloud. No personal information ever leaves the device, and it is impossible to extract any information from the update sent because it is just an aggregate. With the AI model on the device, the system knows the city's visited areas, thus calculating important analytics on traffic flows amongst others. In the case of a pandemic, if the user comes in close contact to a location which had someone infected with a virus, the AI alerts them immediately and gets them to avoid that area. Through this approach, when a user gets infected, they can easily send a warning message to their friends' social circle without revealing their identity and alert them to take the necessary precautions.

As can be seen from these examples, today's approaches allow people to contribute to society without necessarily sacrificing their privacy. Thus, CT system will take care of the individuals and propose adequate actions based upon their personal needs. The government will benefit because it will ensure that citizens take the best service possible, especially those opportunities they're not aware of or which they will need in the future. By suggesting that people undergo direct interventions, it is also promoting healthy living based on statistical analysis and according to that individual's lifestyle. The system will also be capable of analysing the data and make informed decisions. It might predict that an individual can no longer live independently and might need an ambient assisted living solution. It would keep the elderly in the community, save institutionalisation costs and monitor their wellbeing. The system might analyse the occurrence of nationwide emergencies (such as health, fire or flooding) and predict rapid deployment of emergency vehicles.

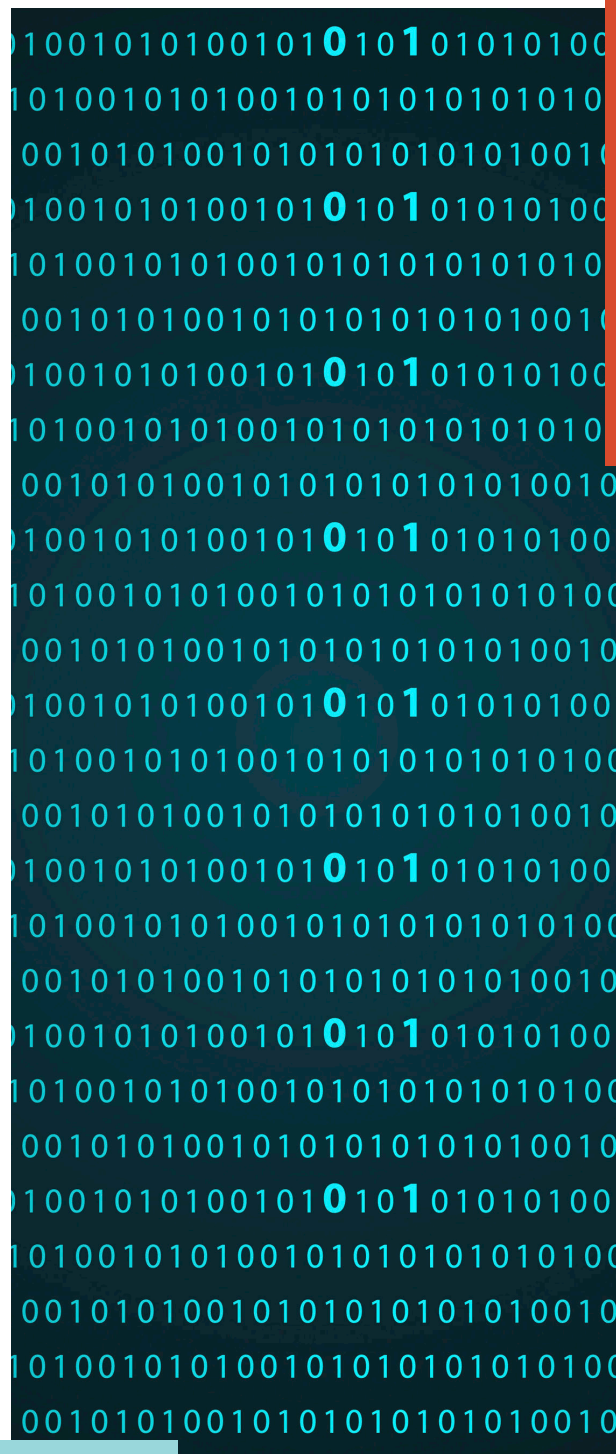
There's a lot that can be done, and with the deployment of a CT system, the government is not only closer to the people, but it will ensure that no-one falls through the social network. It will effectively monitor the individuals and guarantee their utmost wellbeing.

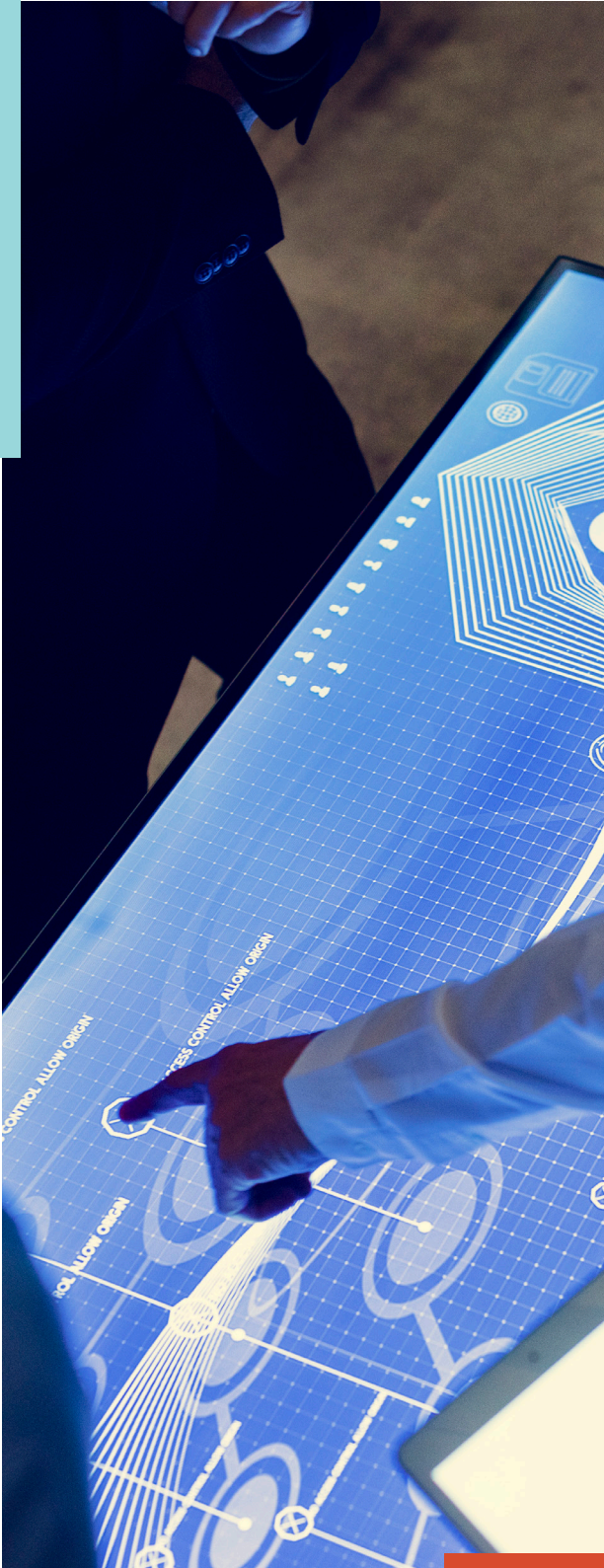


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Blockchain, Decentralisation and the Public Interest:

The need for a Decentralisation
Conceptual Framework for dApps

Joshua Ellul





Introduction

Blockchain and Distributed Ledger Technology (DLT) enable for disintermediation of services and decentralisation of the software processes enabling them. By doing so, processes can become transparent, verifiable, tamper-proof, and immutable. They have the capacity to provide an unchangeable history, or log, of all actions that have taken place which could be traced back to specific stakeholders.

It can be said that such features allow for the implementation of use-cases that strive towards the common good such as financial inclusion, ethical supply chains, and community empowerment – however, decentralisation may not always work towards the common good (Ellul & Pace, 2018).

The question of whether and how exactly blockchain can help towards the common good is, indeed, too wide-ranging. What exactly the term *common good* is has changed, and has been debated

since Aristotelian times (Dupré, 1993). In this paper a narrower concept, *public interest*, and its relation to decentralisation will be explored, after which we aim to provide a conceptual framework that can aid in visualising the decentralisation complexities of DLT. The proposed conceptual framework can thereafter aid in determining a system's relevance to de/centralisation goals in aid of the public interest.

Indeed, much debate has surrounded what public interest

constitutes (Box, 2007), and it is not the intention of this paper to add to this debate. Yet the relevance of decentralisation to public interest will be discussed, and how decentralised blockchain systems can be expressed to help determine if the system is congruent with public interest goals.

The remainder of this paper is organized as follows. Section 2 will discuss decentralisation and its relation to democracy and the



Articles by Academics

public interest and will close off with a conceptual framework proposed to describe decentralisation of a political-administration system. In Section 3 technology related decentralisation issues will be discussed. Then Section 4 will follow with this paper's proposed decentralisation conceptual framework for dApps, and then conclude in Section 5.

Issues of De/centralisation

Many believe and state that decentralisation brings democracy along with it, whether implicitly or explicitly, as stated by Barkan (1998), "the closer representative government is brought to the citizens of a society, both spatially and physically, the more it approximates 'real' democracy. Conversely, the more distant and less accessible representative government is to the citizenry, the less it is democratic" (cited in Hutchcroft, 2001, p.33). Furthermore, democracy is also often said to be a harbinger of public interest. Therefore, it is no surprise that the DLT community often voice the need to *decentralise everything* (Mougayar, 2016; Maloney, 2015).

Yet, Hutchcroft highlights that further analysis is required to determine whether decentralisation necessarily brings democracy, and goes on to show otherwise – that decentralisation can also be a useful tool in an autocracy and conversely that centralisation "measures could be an effective force for democratisation" (Hutchcroft, 2001, p.33). Also, whilst democracy is often associated with the public interest, "theory and experience indicate that there is no necessary connection between democratic procedures and the advancement of common interests" (Barry, 1995, p. 260).

The debate in regard to whether decentralisation or

centralisation works towards the public interest is a long-standing one (Shah, 2006). Some state that localisation (through decentralisation) leads to more corruption (Shah, 2006), which in turn has negative repercussions on GDP growth, quality of public infrastructure, and health services (Shah, 2006) – which justifies why one side of the debate claims decentralisation works against the public interest. However, the other side of the debate argues that decentralisation can help fight against corruption by "breaking the monopoly of power at the national level" but care must be taken to ensure that local elites do not cease powers (Shah, 2006, p.1).

This debate cannot be answered in such a generalised form, in which neither is the public interest well-defined, nor is there a clear-cut answer in respect to what configuration of de/centralisation across the various aspects of administration, politics and governance works best for the wide range of nations and peoples. Indeed, there is no silver bullet. Whether or not de/centralisation is a good/bad thing depends upon many different factors, as put by Charbit in an Organisation for Economic Co-Operation and Development (OECD) working paper:

There is no "yes or no" answer to whether or not decentralisation is a "good idea." Centralised and decentralised approaches can work relatively well, or relatively poorly, depending on a country's historical, cultural and political context, as well as on its ability to exploit inherent strengths and minimize potential weaknesses (Charbit, 2011, p.14).

Furthermore, centralisation and decentralisation are not binary options, but as described by Fesler provide a centralisation-decentralisation continuum “whose poles are beyond the range of any real political system” (Fesler, 1968, p.371). Thus, to really establish an answer to whether de/centralisation works towards the public interest, it would be required to understand not only how the various factors may influence the successfulness of potential de/centralised approaches, but also to what levels the aspects within

the centralised-decentralised continuum are de/centralised. Whilst indeed this does add to the complexity of establishing the usefulness of de/centralisation, Hutchcroft (2001, p.31) highlights that the utility of the continuum “lies in its ability to capture variation.” Hutchcroft (2001) goes on to establish a conceptual framework for describing how de/centralised a particular system is by combining two centralised-decentralised continua into a two dimensional matrix, one axis defining how de/centralised the political system is,

and another axis defining how de/centralised the administration is. This framework could then be used to help align aspects of a system with the ideal decentralised targets that are deemed to be beneficial for the public interest (within the respective cultural and political context). A reproduction of the framework and use-cases follows.



lies in its ability to capture variation.

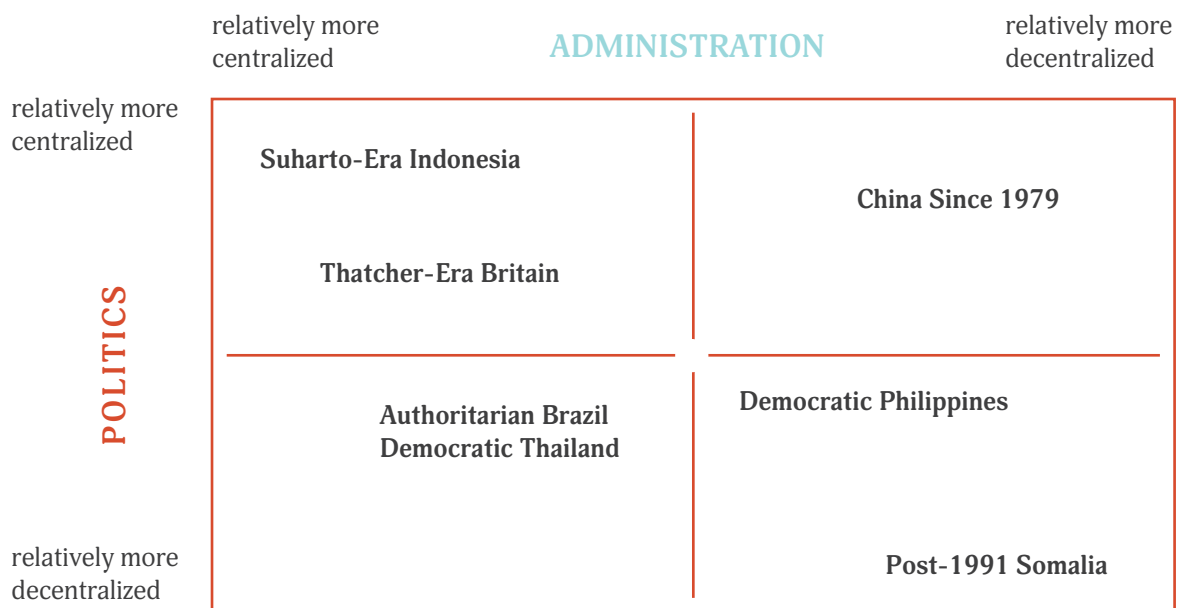


Figure 1: Hutchcroft's conceptual framework for a system's political and administration's de/centralisation. Reproduced from Hutchcroft, 2001.



De/centralisation and Technology

In 350 BC, Aristotle proposed the concept of publicly visible ledgers. Aristotle had argued that any money issued should be done “openly in front of the whole city” and that accounts should be made publicly accessible from “various wards” in order to fight corruption (Aristotle, as cited in Shah, p.479).

Whilst public accounts and auditing activities help to minimise instances of fraud and can bring to light irregular and illegal actions, they may suffer from numerous agency problems (Watts & Zimmerman, 1983). Indeed, rather than rely (solely) on appointed auditors, more information could be made publicly available (as Aristotle suggested) – especially with modern-day technology.

Consider that such a ledger is made public through a web-based system developed and maintained by the government itself (or the institution in question). Indeed, the accounts would then be available for the public to see. However, what guarantees are there regarding the veracity of the data? How can the public be sure that the data has not changed, or was manipulated? One could suggest that the system is outsourced or maintained by a reputable firm and audited – but the problem still remains, and trust is shifted to another entity. Digital systems used up till the late 2000s required inherent trust in the digital service provider (whoever it may be).

Now consider a public procurement system that is meant to accept tendering bids up till a closing time. If such a system provided functionality that allowed staff to manipulate bid submission times



(whether intentionally, or not), then the public, bidders and other stakeholders would not be able to ascertain that the process was not rigged and a favourable bid submitted after the closing time. No matter what level of de/centralisation of the political-administration framework, any processes that are governed by such traditional digital systems are ultimately centralised under the control of the digital service operator.

This is where Blockchain and DLT come in. In a manner similar to how Aristotle posed that copies of accounts should be made public, Satoshi Nakamoto (whoever they may be) proposed that to be able to remove centralised control of a

ledger, it be publicly available for all to see, replicate, and verify, without there being a single operator or computer (or centralised groups thereof) that own or maintain it exclusively. However, enabling for replication and making data public was not a new concept. What Nakamoto proposed which was ground-breaking was a way to ensure that no one could change their copy of the ledger in a manner that breaks the rules of the system and is considered to be valid, and that changes could only take place by one computer at a time, so as to ensure that there is only one canonical version of the true ledger replicated amongst all participating computers.

In essence, Nakamoto (2008)

proposed Bitcoin, “a peer to peer electronic cash system”, the first cryptocurrency. This cryptocurrency is realised by creating a decentralised and distributed ledger (of ownership of Bitcoin). In order to ensure that no one can manipulate the ledger in an invalid manner, a mechanism which provides the guarantees above was proposed. We now call this mechanism *blockchain*, which is one way of implementing a distributed ledger, and other ways to create such a ledger exist using different DLTs.

Later, it was proposed that blockchain and DLT could be





used for more than cryptocurrencies. In 2013, a new blockchain platform, Ethereum (Wood, 2014), was proposed that not only allowed for the implementation of a cryptocurrency, but also allowed for other custom written software applications to execute on top of the blockchain. Since these applications execute on a blockchain, the data and process are publicly available, transparent, and verifiable. We call these applications *Smart Contracts* – software applications that: (i) will do exactly what they are written to do; (ii) allow external parties to interact with them (as per the encoded logic) in a manner that cannot be manipulated; and (iii) can both receive payments and make cryptocurrency payments.

For example, consider that you would like to raise ‘money’ to be able to develop a project, yet you can only develop the project if you raise enough cryptocurrency, and want to give a guarantee to investors that they will retrieve their investment back if you do not manage to raise enough funds – you can write a smart contract to do exactly this. If written correctly, neither yourself nor anyone else would be

able to get access to the funds unless enough funds were raised on time. Even if you wanted to, there’s no company or individual you can call that will be able to manipulate the data or software, there’s no computer you can hack to make the required change, there’s nothing you can do to stop the smart contract from doing exactly what it was written to do.

Recall the public procurement use-case described above – using smart contracts, the procurement system’s digital process can be decentralised. Such a decentralised digital system would make it impossible for anyone to manipulate the process or data. More so, such a system (if implemented correctly) could be made to not even leave room for external critique/questions to be raised, since the process and data could be publicly available and verifiable¹.

¹Indeed, not all data should be made public for various reasons and for such cases different techniques can be used to make that part of the process and data visible, whilst keeping other parts centralised whilst still providing various assurances. In such a manner the technology can be implemented in such

A Decentralisation Conceptual Framework for dApps

Much like the decentralisation continuum discussed by Hutchcroft (2001), blockchain, DLT and smart contracts do not provide a binary option in regard to whether their implementation is totally decentralised, or completely centralised.

In fact, one could argue that most of the decentralised platforms being deployed are not completely decentralised (due to their reliance on existing Internet infrastructure that has a number of centralised points of trust). When we refer to such a system as being decentralised in this manner, we refer to it as a decentralised Application (dApp) which is (typically) comprised of and built on:

- i. **Off-DLT Application:** some degree of application logic which executes outside of the blockchain or DLT – typically includes a web server, browser and web page code (JavaScript + HTML) that executes and renders in the web browser;
- ii. **DLT Application:** some degree of application logic executing on the blockchain or DLT – such as smart contracts;
- iii. **DLT Platform:** the blockchain or DLT implementation itself; and
- iv. **Networking Infrastructure:** the underlying infrastructure which the blockchain or DLT uses to establish and communicate with other networked nodes in the system.

Each component in the dApp can be to some degree de/centralised with respect to the technology implementation and can also be de/centralised with respect to the social structures that govern the technology. Therefore, in order to aid determining whether a particular dApp may work towards the public interest, and given that different contextual political and cultural de/centralisation levels may or may not work towards the public interest, a means of expressing the various degrees of de/centralisation of a dApp (and its different components), is herein proposed. Figure 2 depicts a conceptual framework, a two-dimensional technology-social governance continua de/centralisation stack.



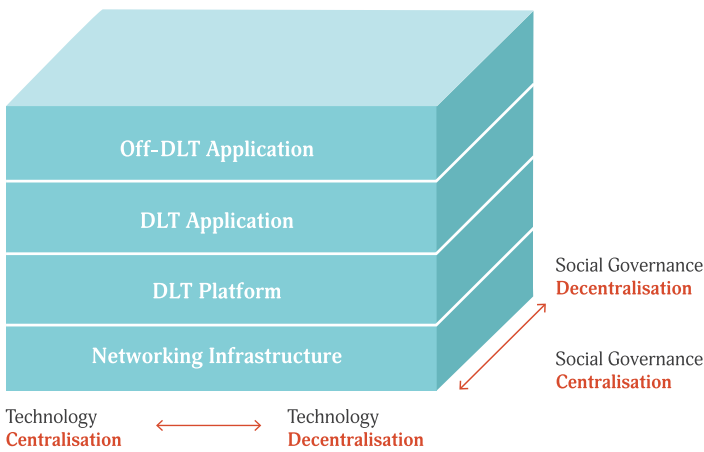


Figure 2: Two-dimensional technology-social governance continua de/centralisation stack.

The model can then be used to describe to what extent each component of a dApp is de/centralised with respect to both technology as well as any social governing structures, whilst also depicting software component dependency by having one component built on another. Consider the public procurement system again. The associated dApp de/centralisation stack follows in Figure 3.

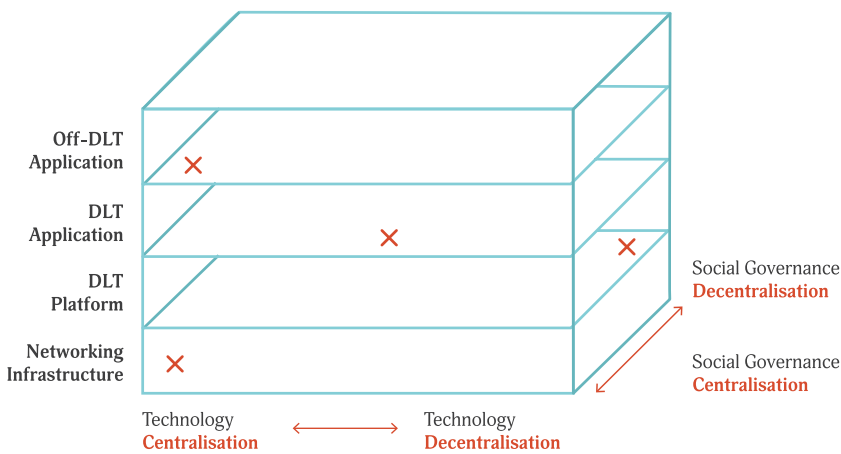


Figure 3: Public procurement dApp de/centralisation stack.

a way that its de/centralised parts map directly onto the centralised-decentralised continua of the associated political-administration process it is being used for.



Such a system would likely make use of existing Internet infrastructure to ensure ease of access. The Internet and supporting infrastructure are heavily centralised. To use this system, one's computer would need to communicate through one's Internet service provider (ISP) – a central point of trust). The Internet works by creating point-to-point links between the computer and ISP; ISP to any national or other international infrastructure, and any intermediate links, until a link is made to the destination computer's ISP, and finally to the destination computer itself. Once more, it is point-to-point, i.e. each point being a central point of trust. Each point is also governed by a particular entity. So as can be seen above (in the Networking Infrastructure component), both the technology and the social governance are heavily centralised.

When it comes to the DLT platform an open, publicly-accessible, and transparent system that can provide guarantees in regard to the digital processes and data would likely be used (say, for instance, Ethereum). Such a DLT platform should be decentralised in regard to who governs it to ensure that the government cannot alter the platform or remove any guarantees, and the technology should also be decentralised for the same reason – and therefore the DLT platform is depicted above as decentralised in both dimensions. Indeed, there is debate in regard to a number of centralised points that exist in such types of DLT platforms both with respect to the technology and social governance²; however, they are beyond the scope of this article.

The DLT Application would likely be implemented as smart contracts to provide required guarantees, e.g.

that no tendering bid is accepted after the tendering process has closed. Whilst smart contracts will do exactly what they are written to do –this could provide completely-centralised logic that allows for a single administrator to use the smart contract, or could allow any member of the public to have a say, for example equal voting rights. In the public procurement use-case certain aspects of the procurement process implemented in the technology would likely be centralised (e.g. reissuing a tender), whereas some aspects would likely be decentralised (e.g. access to submission times for each bid) and therefore the technology de/centralisation marker is placed somewhere in the middle of the continuum. However, social governance over the smart contracts (e.g. ability to deploy new smart contracts for new types of tenders) would be completely centralised to the government.

In order to provide users ease of access to the dApp, an Off-DLT Application component would be used and comprised of a standard web page framework that interacts

² For example. a computer node makes a connection to the decentralised network by relying on a number of central points of trust (DNS servers, domain name administrators, seed nodes, and so on)and often a DLT platform has a group of core developers that decide on what software upgrades to the platform (proposed by anyone) are accepted, or not.



with the users' browsers to provide an easy-to-use interface. Both the technology, and social governing structures are, of course, centralised in this case. Even though this final layer that the user interacts with is centralised in both dimensions, the decentralisation achieved using the DLT Platform and Application provides the guarantees required.

Indeed, different dApp architectures may exist which potentially make use of a number of different DLT systems or any other configuration. Therefore, the stacked components could be modelled differently for such varying architectures.

The conceptual framework can then provide insight and be compared against the de/centralisation targets for the particular political and cultural context. For example, for a particular political and cultural context it may be the case decentralise various activities of the government, yet to centralise ISPs. Similarly in one context a Government-backed digital centralised monetary system may work better towards the

public interest, whilst in another a decentralised monetary system based on an open and public cryptocurrency may work better – both of which may be operating using centralised ISPs and infrastructure which may work best towards the public interest as well. The conceptual framework above can be used to depict a system's multiple levels of technology-social governance de/centralisation.

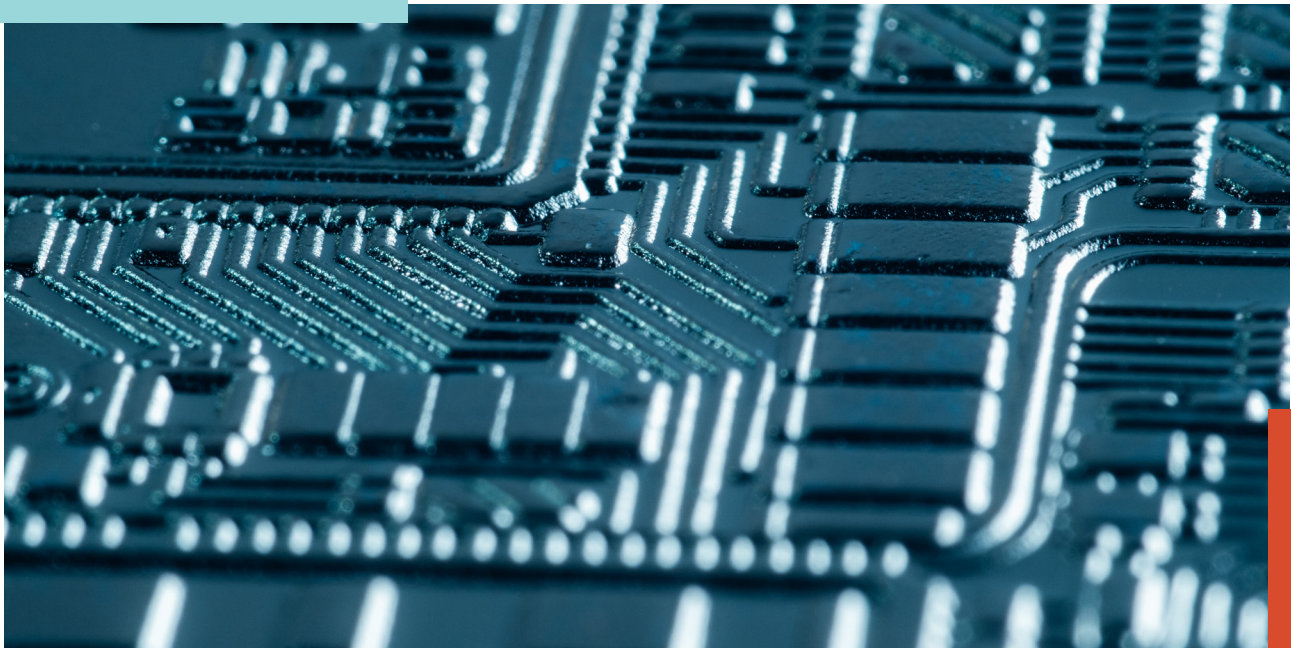
Conclusion

Determining whether a de/centralisation works or not is dependent upon the particular political and cultural context (as discussed in Section 2). Hutchcroft proposed a conceptual framework to aid determining the political-administration de/centralisation continua (Hutchcroft, 2001). With the advent of DLT technology the complexity of de/centralisation is amplified given the various components it makes use of and that each component has an associated technology de/centralisation continuum and a social governance one.

In a manner similar to how Hutchcroft provides a tool to determine a system's de/centralisation position which can then be used to determine whether a system is congruent with de/centralisation targets that attain public interest for the particular context, in this paper we have proposed a conceptual framework to help determine the various de/centralisation levels of a blockchain or DLT system dApp which can then further be used to compare with de/centralisation targets for the particular political and cultural context it is being used within.



Government-backed digital centralised monetary system may work better towards the public interest...



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The Challenging Role of Female Decision Makers in Maltese Trade Unionism

Ayfer R Aquilina

Female Decision-Makers

Trade Unionism

Organisational Culture

Societal Perceptions

Introduction

Trade Unions are considered as important key-players within the social dialogue framework.

Over the years, it has become more evident that within this important element of the industrial relations scenario, women have often been left in the shadows and were rarely, if ever, present in the high echelons of the union or organisation.

On an international level, Trade Unions have since their inception been a hive of masculinity, and are most regarded and looked upon as male-domain organisations with an embedded litigious nature (Amini et al, 2018; Kirton et al, 1999) On the local front, various literature and research studies bring to the fore that the top seats of the decision-making positions within these organisations are filled by men, even though female membership at the bottom level shows a high presence of female active members. (Debono, 2018; Department of Industrial and Employment Relations (DIER), 2019).



It is a common perception, both in society and literature, that *“women are women and consequently live ‘women’s’ lives”* (Forrest, 1993). This reasoning was more evident in earlier days, when women tended to leave the workforce to take up their ‘duties’ as family-carers. Although women have been on the increase in the labour workforce, unfortunately they still lag behind when it comes to top-management positions or occupation of high-level roles, including within the structures of trade unions. (European Institute for Gender Equality, 2020).

Government policies and a paradigm shift in the working conditions to address work-life balance realities, acted as catalysts to witness a steady increase in career progressions, and a more active participation of women within decision-making fora and on negotiating tables within the industrial relations scenarios. One needs to ask whether this was a smooth transition, or whether women are still struggling to climb up the hierarchical ladder within this ‘gentleman’s world’ of trade unions.

Studies demonstrate that women dominate within the five Cs of the formal labour market – Caring, Cashiering, Catering, Clerical and Cleaning (Ledwith, 2012). Increase in trade union female membership has, over the decades, been the direct effect of labour trends and of the economic sectors that were mostly identified as female-oriented. This was also evident over the years within the Annual Registrar of Trade



Short Research Reports by Public Service Officers

Union reports, identifying the sectors where a high female presence is registered, clearly pertaining to the teaching, family care, psychology, counselling, and tourism fields – a clear and direct link with the 5C professions in the labour market that are female-dominated (DIER, 2019).

Data gathered from the Registrar of Trade Unions report reflect the sectors representing the 5Cs of the labour market mentioned earlier, wherein females scored an 85% trade union membership share in sectors representing family, health, and well-being, with another high member representation share of 79% in Trade Unions representing the teaching sector.

However, various literature highlights that, although the rise at the lower tiers of the union organisation are female-dominated, top level leadership roles are most often occupied by male unionists. This phenomenon results in “issues most salient to female workers ... not becoming a priority during the collective bargaining process” (Amini et al., 2018).

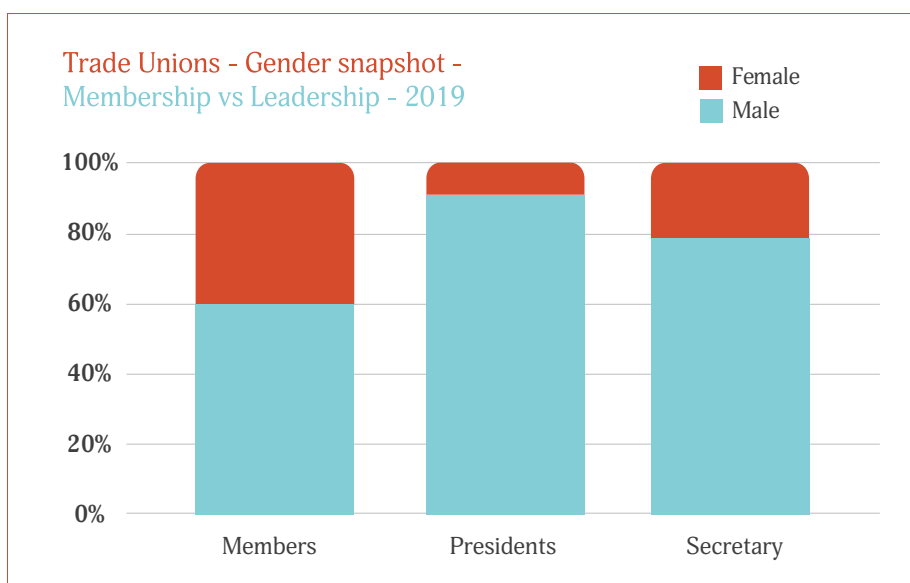
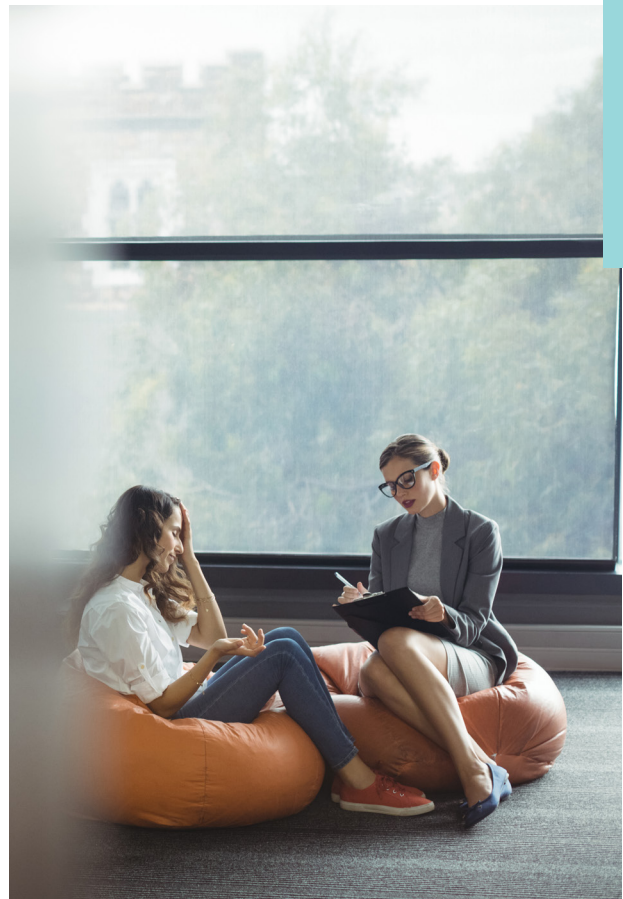


Figure 1: Female vs Male membership / Leadership in Trade Unions. Data source: DIER, 2019

Figure 1 above shows that from a total of 33 registered unions as at November 2019, only 10% of these unions are being led, or have, females occupying the top-tier seats (DIER, 2019). This demonstrates a clear picture of the inverse proportionality between female membership within trade unions vis-à-vis the female leadership presence within those same unions.

Scope and objectives

The research study highlights the challenges encountered by women who occupy, or have occupied, top-level seats within trade unions and the societal perceptions that these organisations embody. The following questions represented the main elements of the study:

- What are the factors that are keeping females from occupying top-management positions in trade unions?
- How are females perceived in this male-dominion?
- What are the hurdles encountered in order to occupy a seat at the top echelons of union structures?

Method

These objectives were tackled through two main research tools – Seven semi-structured interviews with active and former trade unionists, of both genders, to ensure a more holistic and wide spectrum of experiences from a male and female perspective - and also an open-ended online questionnaire disseminated randomly to 300 participants aged 18 years and over, to members of the public, to capture the perception that trade unions hold within society.

This tool generated 196 responses (65.3% response rate) that included 150 females and 46 males. The software used (Survey Monkey[®]) allowed replies to be stratified by gender and guaranteed anonymity of respondents. Interview participants were not identified due to sensitivity of subject matter and were referred to as Interviewee A, B and so on throughout the study. Findings from both tools were analysed thematically.

Findings

Perception of Trade Unions as male-dominated organisations embedded in masculine roots.

The perception that Trade Unions are regarded as male-dominated organisations was commonly reverberated throughout the study, with an interviewee going even further as stating, “This is more than a perception...this is a reality...I experienced it”.

This reality was further rooted in the fact that the first trade unions were mainly representing the manufacturing and shipyard sectors. These sectors were pre-dominantly male, leading to the bulk of its members being male and thus rooted in masculine practices, norms, and organisational frameworks. To a certain extent this trend is still the norm since, as stated by former trade unionist, “Societal culture is still not prepared or aware that women too can embark on a career within a Trade Union”, especially because of the militant and litigious nature attributed to Trade Unions.

Experiences shared by female interview participants shed a light on this perception:

The way they [male colleagues] interacted with me could easily have been interpreted as harassment or bullying. Their habitual language and way of interaction amongst each other at first made me feel uneasy... their response was that for them it comes natural since it is not customary that they have females as their peers at the office.





Media portrayal of Trade Unions further corroborated this ‘bad imagery’ that could have also been a deterrent for females embarking on trade union involvement or considering pursuing such careers. Henceforth, stereotyping was a common determining factor that further strengthened such perception towards Trade Unions. The various quotes which are produced in this paper from the fieldwork carried out support this stance.

Determinants that influence the extent of female presence in Trade Unions

As mentioned earlier on, stereotyping, in the form of societal norms, was a pre-dominant deterrent that

shackled females from committing - or even joining - trade unions. Interviewed trade unionists stressed that, even though trends have shifted more towards gender-neutral role sharing, there were still some instances where society is “male-driven and household and children responsibilities, especially if still young, still fall on the woman’s lap”. They echoed that cultural stereotyping can only be broken if society and such organisations nurture and mould females from a young age, instilling within educational institutions the maxim that roles and jobs are, and can be, carried out by any gender.

Most of the female trade unionists interviewed commented that holding a role within the higher hierarchies of the union, requires a great commitment, and thus it would be crucial that “you have a back-up plan in place since this job is 24/7...especially if the sector you are responsible for represents shift workers”.

Extent of influence of sector represented by Trade Union

In this regard, female-heavy sectors such as teaching, nursing, or public sector administrative fields, still struggled to attract and retain female 'leaders', even though at membership levels, these unions registered high female presence. This consideration was experienced by a male interviewee during his stint of leading the textile section within the organisation. At the time, the section was 90% female. He recounts, "I was flabbergasted when the time came for the members to nominate a shop-steward and they presented a male name."

In this regard, female interviewees corroborated that:

One of the biggest hurdles was not actually the sector itself but rather the transition between having a male shop steward representing the sector to having a female shop-steward... the moment you gain the trust of the members and prove that you mean business and have the skills to put forward their issues, the sectorial barrier drops.

However, a difference in attitude and approach from male peers, especially when the seat under contest was a full-time role and higher in hierarchy, was still strongly present. One female respondent stressed that their "antagonistic attitude towards me was saying that they felt I would be a threat to their success of regaining their top-seat positions".

Echoed by a male trade unionist, this participant highlighted that sectors with a large female catchment had greater perception of issues that affected mainly female needs, such as child-care or flexitime, among others. He observed that "it would be beneficial for male-heavy sectors to emulate these sectors and come up with more lucrative packages and conditions to attract more female members within the field". However, this way forward depended heavily upon the innate behaviour and pre-disposition of women themselves to be present within the corridors of trade unions and make their presence felt and be recognised on the top seats of these organisations.

Feminine behaviours and mentoring

The majority of female interview participants explicitly and commonly remarked that "no-one will change things for you", and thus one needs to adapt and push through. Past experiences and exposure to representing bodies further nurtures the disposition of embarking on trade union careers. Such involvement helps nurture those necessary skills in order to progress, and eventually reach, high seats within the trade union representing various sectors. Women themselves need to recognise their abilities and valid inner qualities, that could prove to be an added value to the trade union. Their professionalism and participation, starting from the lower ranks, could be their trump ticket to prove to their leaders that they have 'what it takes' to occupy such seats. Most of the interviewees agreed that, once top management recognised such skills and commitment from these female officials, they supported them to take on higher roles.



This inner strength was challenged especially in male-heavy sectors where, more often than not, these were headed by a male secretary of sector. Female trade union officials were often reprimanded and continuously reminded to “speak up only if I say so...it was common practice that he insisted that only he speaks and the other officers are left in the shadows without intervening”. This was, to say the least, unnerving and it was only with their innate determination to speak up did they hope to demonstrate that they, too, had valid contributions that could be beneficial for the organisation, and ultimately for the workers. This strong stand was the winning ticket to prove to the top-management that females too had the qualities to eventually make it to the top hierarchy of the organisation.

This observation was also emphasised by a former male trade union leader where he stressed the fact that, sometimes, the sentiment of ‘women being their own worst enemies’, was hindering them from progressing in such organisations. Concurrence from all interviews stressed that, women need to voice their suggestions and contributions, to ensure that this gender barrier is broken.



**impeding
themselves away
from such positions”.**

Having role models is one such way to ensure this shift in decision-making roles occupancy. Role models and mentoring are key ingredients that can guarantee “a breath of fresh air” needed in such organisations. Trade Union organisations were embarking on continuous training to aspiring trade union officials. Such training is provided across the board, irrelevant from gender. These mentoring sessions are usually given during working hours, to ensure that family-care responsibilities are not disrupted. Sadly, it was observed that, most of the women undertaking such training, subsequently do not pursue this line of work and therefore are impeding “themselves away from such positions”.

The importance of having female role models and mentors that help, was repeatedly stressed by female participants, since such colleagues “cultivate in you those skills and leadership traits that will help you perform brilliantly within your sector, especially around the negotiation table. If you want to be respected as a female leader, you have to work for it and not expect it simply because you are a female.”

Public perception of Trade Unions

The attributed role of family-care to females was clearly highlighted, with 79.8% female survey participants indicating that they are the prime-carers of the family. Furthermore, 42% of all respondents had never been part of a trade union organisation, with only 10.2% declaring that they are active paid members. Further insight shows that female respondents are more absent in trade union scenarios when compared to their male counterparts.



When asked whether Trade Union organisations are regarded as male-oriented organisations, 74% of all respondents concurred. This further corroborates the notion of ‘male-heavy’ imagery portrayal and perception which may act as a deterrent to shy off females from joining trade unions or eventually pursue a career within the same organisation.

A varied list of determinants presented in the questionnaire, and

illustrated in Chart 1 below, gives an overview of the factors that are considered as stumbling blocks for women to feature in trade unions or pursue and progress in a trade union career.

Further participant comments included lack of interest and awareness of unions, social constructs that encourage mostly males to participate more in all walks of life, and also the fact that females usually engage

themselves more in religious groups or other NGOs, with a male participant saying that “trade union representatives were for a long time male, so it would be difficult to remove this stigma [sic] and it would take a great effort to overcome it... house unions especially, often work on voluntary basis outside working hours, which in itself is an obstacle”.

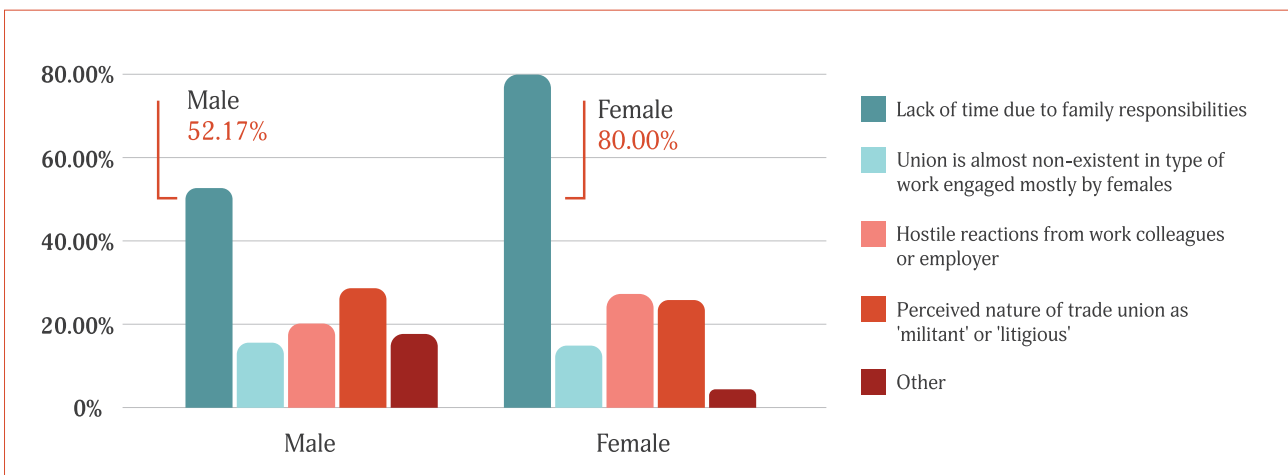


Figure 2: The main factors that prevent women from joining a trade union



Another insight identified the factors that limit women trade unionists from advancing in such a career. Chart 2 below gives a visual overview of the replies given; once again demonstrating the ascribed role of family care to females garnering the highest choice, and the innate ‘soft’ disposition of females also featuring high as a main stumbling block for female progression in Trade Unions.

A significant comment by a female respondent that reverberated the sentiment witnessed across this study, also echoed the societal barrier that inhibits women from featuring prominently in such headship roles since she stated that as yet “society is not fully geared towards equality.”



society is not fully geared towards equality.

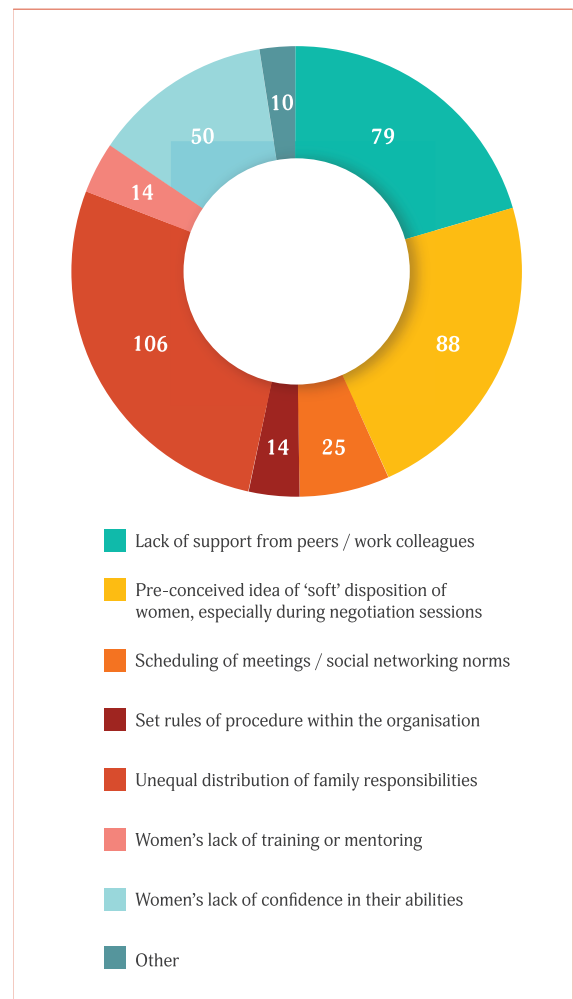


Figure 3: Factors that limit women from advancing in trade union career (by number of respondents)



Conclusion

This study brought to light a number of common determinants that hinder and challenge the presence of females within organisations that are structured on male-oriented norms and practices.

Trade Unions, since their inception, have been such examples and to a certain extent, still harbour elements that prove to be arduous challenges for women to pursue high-level careers within said Trade Unions.

The arguments captured in the in-depth interviews and also in the results gathered in the survey further corroborate these arguments, namely:



- a) **The divide between men and women in high organizational power positions**, leading to the evidence of inverse proportionality between male and female trade union membership vis-à-vis leadership role occupancy;
- b) **The construction of media imagery and portrayal of trade union organisations as a male hegemony**, and thus corroborating the perception that such organisations are more befitting to a male rather than female presence;
- c) **The interactions/relationships between male and female peers in trade unions**, with the common observation that male trade union activists most often regard female peers as unsuitable to fill in and commit to fully to decision making roles, due to the ascribed role of females to family care;
- d) **The individual identity and inherent behaviours and attitudes of the female activists within these trade unions** who are most often perceived of possessing a ‘soft’ disposition and lack that ingrained militant approach. This perception limits female activists from making their presence felt around the negotiation table or not being able to achieve better working conditions for the trade union members. On the contrary,

as highlighted by the interview participants, it is this same ‘caring’ and ‘sensitive’ attitude that makes female trade unionists more perceptive to holistic, gender-neutral issues and therefore prove to be an invaluable contribution to policies and amelioration of working conditions in different sectors of the labour workforce.

Based on these findings, the research study recommends that Trade Unions should become role model employers:

- i. in adopting work-life balance policies in their organisations;
- ii. Mentoring upcoming female activists;
- iii. Provide training programs to attract young females.

The investment needed to recruit and retain female trade union officials, while at the same time removing the glass-ceiling for them, would definitely ensure a positive rate of return to Trade Union movement.

The feminine acumen will embellish the structure of such organisations and ensure an added value with a win-win result, not only for the organisation itself, but for society at large.



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Leadership For Parental Involvement

Christabel Attard



Parental Involvement

Leadership

Partnership

Learning Community

Vision

Primary School

Introduction

Parents are important stakeholders in education who not only provide their children with support but are also an invaluable asset for school improvement (Desforges & Abouchar, 2003).

If parents and schools recognise this, they can work in a collaborative partnership, with schools trusting parents, who as a result feel empowered and participate more (Torre & Murphy, 2016). The benefits of such a collaborative partnership go beyond successful students in terms of academic achievement, with research pointing to benefits for all stakeholders and the school (Gascoigne, 1996).

With schools' increased autonomy, different educational policies are calling schools to engage in purposeful partnerships with families and the community (Mleczo & Kington, 2013). Educational leaders are expected to facilitate such initiatives (Riehl, 2012), since "they are in a special position to encourage and inspire increased PI" (Jeynes, 2018, p. 160). Locally, the



same scenario applies, with the National Curriculum Framework (NCF) identifying school leaders as crucial agents in providing “strategic direction, resources and support” for such a partnership to happen (Ministry for Education and Employment, 2012, p. 5). This is not an easy role for the leader, who has to work towards meeting the needs of the school in this regard, but at the same time might feel pressurised by existent policies and the expectations of different stakeholders (Bush, 2007).

Sergiovanni (2009) proposes a way to develop a learning community, mainly through guiding and motivating, which can be executed by an effective leader who models desired behaviours and leads by example. Similarly, the NCF (MEDE, 2012, p.53) promotes a role where leaders are seen “... leading by example through active participation”. However, all schools are unique and have different cultures, so as concluded by Griffith (2001), a particular leadership style can have different effects in different schools. To help with this,

throughout the years, different PI frameworks have been proposed. However, most of these frameworks describe the general practices for partnerships, which schools can adopt in order to enhance PI (Hornby, 2000). Although this helps keep the staff updated, research evidence shows that such models are not sufficient as it is crucial for schools to design a school approach based on the school’s emergent needs (Jeynes, 2018).



Articles by Academics

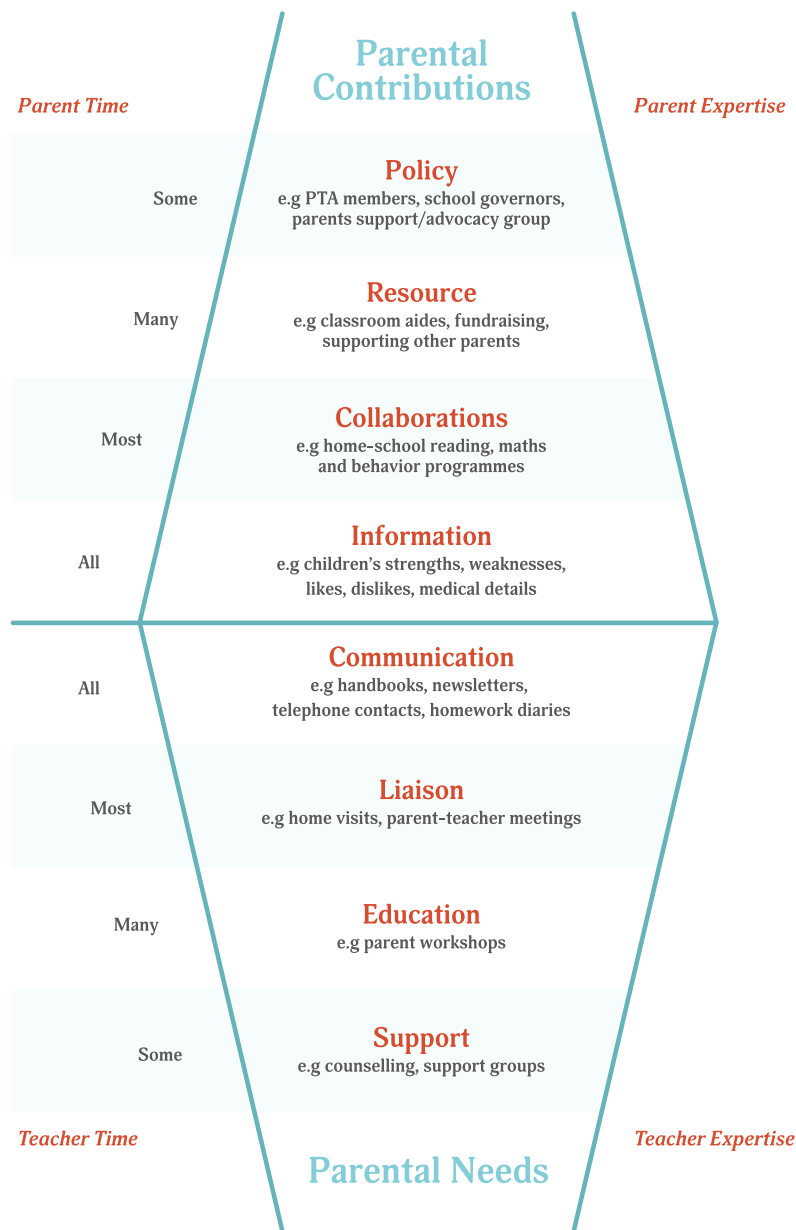


Figure 1: Hornby's Model for Parental Involvement (2000, p. 23)

One such model was developed by Hornby (2000) by combining the existing ones, with the aim of providing schools with a solution for the difficulties they face to engage in partnerships with parents. This model, presented in Figure 1, is intended to be used as an internal review to assess the school's needs and start working on a plan of action. The current study adopted this model for the same cause. Starting from a needs

assessment of the school, together with an understanding of the parents' and educators' needs and wishes, the study aimed at evaluating the current provision of PI against Hornby's theoretical model (2000, p.23) to guide PI practice in terms of *policy, resource, collaboration, information, communication, liaison, education, and support* through the leader's vision.



Goals And Objectives

The study sets out to analyse the situation in one state primary school in more depth and to provide empirically informed recommendations for the enhanced involvement of parents. This depends on all stakeholders, meaning that a culture of participation should be encouraged both from the school's side as well as from the parents' side. The research question formulated aims at contextually developing an understanding of PI with all participants and stakeholders, where everyone realises that this crucial right and duty entails going beyond activities such as participation in the school council and parents attending open days held at school.

How can educational leaders pave the way for increased parental involvement at the school?

Method

A qualitative case study design was chosen as it best allowed the researcher to “explore processes, activities and events” in depth for the particular school in order to be in a better position to answer the research question (Creswell, 2014, p. 187). Moreover, the case study also allowed the researcher to use different instruments (Cohen et al., 2007), providing access to the multiple interactive processes at work (Bell, 1999).

This research was not bound by a number of participants, since no formula exists for sample size in qualitative case studies (Cohen et al., 2007). However, the researcher sought a representation of the whole population.





In line with Mason (2002), the integration of methods was utilised to answer the research question from different perspectives. First, the researcher conducted a group interview with all the Senior Leadership Team members (SLT), since this type of interview allows discussions between participants to develop (Cohen et al., 2007), helping people who are working together for the same aim become more familiar with all the respondents' views (Watts & Ebbutt, 1987).

Next, a semi-structured interview was conducted with the Head of School (HOS). This allowed the researcher "to delve deeply into a topic and to understand thoroughly the answers provided" (Harrell & Bradley, 2009, p.27).

Finally, separate focus groups were held with eight educators and seven parents. The researcher was

seeking interaction between the participants, where all weight is shifted to their agenda (Cohen et al., 2007).

An inductive thematic analysis method was applied to analyse the data generated since it provided flexibility, thus allowing the researcher to organise data in common themes on subjects raised by all participants (Braun & Clarke, 2006).



**different perceptions
of parental
involvement exist.**

Results

The importance of this study lay in its attempt to look at a composite picture from the different stakeholders' point of view, to be able to understand the existent policies, practices, wishes, and needs to balance the many prescriptive publications on PI, according to the exigencies of the school. The main findings are presented below:

- All stakeholders, including parents, agreed that PI is important and necessary for students to progress in their learning. Correspondingly, the literature consulted shows that since PI and academic success share a positive relationship, most parents care about their children's education and recognise the importance of being involved (Hornby, 2000).
 - However, findings show that *different perceptions of parental involvement* exist. Parents describe their PI experience as showing interest in their children's education, which mainly manifests itself in being present for their children at school and at home; providing support at home to contribute to the children's progress at school. Research acknowledges that PI takes several forms, with providing help at home being one of them (Desforges & Abouchar, 2003). Similarly, educators acknowledge the importance of supporting students. However, educators strongly believe that in addition to supporting students, parents are assets in supporting educators and the school. This perception led teachers to engage in different practices such as using the information provided by parents on children's strengths and needs to inform their teaching. Similarly,
- Hornby's model for PI (2000) advises schools to use parental strengths, mainly *information, collaboration, resource* and *policy*. SLT members delve even deeper and recognise the importance of different levels of PI, outlining the necessity of giving parents a voice. According to Mleczo & Kington (2013), it is crucial for leaders to hold such views, since leaders' perceptions inform their vision, which in turn influences all stakeholders.
- The research found that SLT members, together with educators recognise the importance of working in partnership for a quality education, as all stakeholders have the students' interest at heart. There was generally an attempt by the school to work in partnership with parents by providing opportunities for PI to *enhance the school as a learning community*. This ranged from opportunities for parents to organise fundraising activities at school to invitations for parents to provide their feedback on various matters, including the school's Action Plan. All these practices are corroborated by literature as effective ones which help parents increase their trustworthiness in educators and the school (Hornby, 2000). However, findings showed that whilst most educators felt that PI was at its best, parents expressed their wish to be involved more, especially in their children's learning. This is in line with Borg Axisa's study (2020), with one of her findings being that PI in state schools in Malta mostly follows Hornby's Expert Model and Transmission Model (2000).





- In strengthening the school as a learning community, the HOS recognised *the need of engaging parents more*. This conforms to literature on PI, where effective schools are described as ones which involve the parents and the community, and where leaders start from a needs assessment to inform their actions (Bush, 2007). Although Young et al. (2013) argue that PI is mostly attributed to educators and parents, the school leader's role as a facilitator of increased PI is significant (Griffith, 2001). Many times, this is not an easy role (Bush, 2007) and the HOS was aware of this. However, the HOS had a plan, and planning is viewed as crucial in situations where the leader wants to include stakeholders in a process, especially if it includes change (Sergiovanni, 2009).
- In their struggle to be more involved in their children's education, parents talked about the *continuing challenges* which they faced. The SLT and the educators also identified barriers in reaching all parents. A lack of school policy, some teacher resistance, as well as lack of cooperation from parents for different reasons, were identified as the major problems in an effective partnership between parents and the school. Studies of PI in schools also identify similar barriers (Hornby & Lafaele, 2011).

Recommendations

a) Recommendations for Practice

In the same way that Booth & Ainscow (2002) propose three dimensions to help make a school more inclusive, the researcher proposes that these dimensions be used by the HOS to strengthen the school as a learning community, having both educators and parents on board. As a result, school improvement should focus on utilising the different levels of parental contributions and addressing the different levels of parents' needs by providing opportunities for partnership for each component of Hornby's theoretical model (2000) to address *culture, policies, and practices* (Booth & Ainscow, 2002).

Creating an inclusive culture will help educators appreciate parents, regardless of the diversities, and vice versa. In turn, this will lead to producing an inclusive policy, which is sensitive to all parents' needs. As a result, all parents feel welcomed and supported by the school, engaging in dialogue and practices, helping them to recognise their roles, which in turn promotes more involvement. Furthermore, the HOS, together with educators, can instigate more practices to ensure that parents have different opportunities that go beyond presence and representation, practices which give parents a voice.

b) Recommendations for Further Research

The researcher wanted to examine the situation in depth, and thus embarked on the current study with a broad view of PI. Further research can choose to focus on two aspects for a more detailed analysis.

A gap in leadership for struggling parents might still exist. The researcher admits that since the representation of parents might not have included struggling parents, as they may have sought not to participate in the study, it would be beneficial to analyse these parents' needs because all parents matter.

During this study, time was a major limitation, which was partly compensated for by using focus groups to generate rich data in a shorter period. A Participatory Action Research, which is more time-consuming, but which can provide all stakeholders with the opportunity to study and improve their own practice, can be implemented in different schools in the same college or different colleges.





Conclusion

Undoubtedly, the leader's role remains pivotal, because although the leader alone cannot achieve what needs to be achieved, someone must set the ball rolling. López, Gonzalez & Fierro (2006) refer to the leader as the one who must partner two worlds for the collective benefit of all stakeholders.

Although this might prove challenging, the power the leader distributes can be viewed as a collective investment, where ultimately other stakeholders help the school improve. Indeed, PI remains a powerful tool in the hands of the leader to use for improvement, where together in a community of support, the HOS, educators, and parents can achieve more. Theoharis (2012, p.xv) refers to the cruciality of developing “leaders who run schools that deliver on a promise to meaningfully include, educate, and nurture each and every child”. The researcher extends this invitation to all parent and teacher leaders. Although the child is at the centre of the educational system and, with increased PI, all stakeholders work for a better education for the child, this study concludes how in engaging themselves, all stakeholders would in turn be engaging in personal development.

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The Impact of IPS-funded Scholarships on Beneficiaries, the Public service, and Maltese Society

Margherita Axisa

*Institute For The Public Services
Scholarship
Human Capital & Further Education*

Background

The public service offers financial sponsorships to public officers with the aim of helping them continue their formal education, in order to acquire higher qualifications and develop their human capital.

These sponsorships, which vary from short training courses to PhD programmes, are administered by the Institute for the Public Services (IPS), which provides courses specifically for the public service through a collaborative venture with two higher education institutions: the University of Malta (UOM), and the Malta College of Arts, Science and Technology (MCAST). Additionally, IPS is also responsible for the administration of scholarships funded by national funds and the European Social Fund (ESF), which is obtained through the EU to support employment and social inclusion.

The public service has grown substantially in recent years, and it is only through trained, qualified, and dedicated employees that it can offer an efficient and effective service to the general public. Now more than ever, public service employees need to engage in policy and research, embrace new technology systems, and adapt to growing and shifting demands. To strengthen



such a workforce, employers need to ensure that the skills of their employees are nurtured, and that they are in line with the respective objectives and needs.

In fact, pertinent literature emphasizes the view that education is an important source of skills and innovation (Crawford, 2008; Feldman, 2000) and suggest that investing in scholarship schemes offer significant benefits to employers.

In addition to this, studies show that education represents a positive investment that represents several benefits for employees, including in terms of higher wages and job satisfaction. Moreover, literature

indicates that the benefits of education are not limited to the firm, but possibly also to society in general. Indeed, studies have linked further education with a healthier society and increased awareness of civil duties, including charity, social cohesion, and civic duties (Borgonovi & Miyamoto, 2010; Cutler & Lleras-Muney, 2010; Miyamoto & Chevalier, 2010).

IPS is part of the People and Standards Division (P&SD), with the role of managing and developing the efficiency of the public service. The Institute provides training programmes that include short courses which are tailor-made for the public

service, and also organizes scholarships for employees. The scholarships offer the possibility of studying at local or international institutions, in order to ensure that employees are presented with ample opportunities. The aim of the scholarship is twofold: first, to ensure the formation of the civil servants at the different stages of their employment; and second, to support the continued upskilling and dynamism of the public service.





The rationale for funding education through IPS scholarship schemes

The extent to which a workforce is skilled plays a major role in relation to a country's economic growth. Literature suggests that, other things being equal, a country with a higher level of human capital has a greater possibility of higher growth, wages, and economic wellbeing (Von Brockdorff & Amaira, 2017). Considering that labour is the most important creator of wealth for Malta in view of the practical inexistence of any natural resources of significance, and in the light of the predominance of services, it may be argued that it is of particular necessity for Malta to invest in its workforce in order to ensure that it remains dynamic and competitive. This is not to mention the possible positive impact of education on the rest of society.

Despite the importance of education for Malta's socioeconomic landscape, results from the survey that was disseminated among beneficiaries indicate that 50 percent of beneficiaries would not have carried out the further studies had they not been awarded a scholarship, possibly due to the expenses involved. In this context, in view of these facts and indicators, it appears that education cannot be left to its own devices or to the employees themselves, but rather, employers – in this case the public service – have to step in to provide the appropriate and conducive conditions in the form of scholarship grants to ensure that their workforce remains dynamic and skilled.

Need for this study

This research intends to explore the impact of human capital investment on the Maltese public service as sponsored by national and international scholarship programmes. Despite the significance of upskilling projects such as that of the scholarship programme offered by one of Malta's largest employers, the public sector, an analysis of such initiatives in the Maltese context has yet to be conducted. The need to focus on Malta is a crucial component of our study, in view of the specificities of the Maltese labour market and of the economy. To the best of our knowledge, the only study which is situated in a Maltese context that comes somewhat close to our objectives is that of (Grech, 2018), whose paper sought to investigate the extent to which the University of Malta, which encourages worker retraining by reimbursing tuition fees, is successful in harnessing the benefits of its investment. However, while the need to ensure that employers get to reap the benefits of their educational investment in employees is immensely pertinent, and insofar as this is discussed in relation to the IPS scholarship in the final recommendations, in this study we are solely concerned with the impact of the investment itself, and not the ex-post retention of its benefits.

Therefore, by focusing on the IPS scholarship scheme and its efficiency, the project will seek to address the puzzling dearth of research on scholarship in Malta. In doing so, this is the first study of IPS scholarships,¹

¹ Information provided by IPS shows that there have not been any previous studies on IPS scholarships (see Appendix II, Ques. 4.5.2)

which is probably the largest scheme in Malta ever to provide funding for employee retraining and upskilling. Understanding the efficiency of the IPS scholarship scheme is critical not only because the public sector is one of the main employers in the Maltese economy, but also in light of the fact that the funds are derived from the national budget, which raises the need for accountability and academic scrutiny.

Results

The overarching conclusion is that further studies sponsored by IPS provide significant benefits for public service employees, the public service as an employer, and to Maltese society.

Specifically, it was noted that further studies contribute to higher pay scales, income, promotions, and job satisfaction for employees benefiting from scholarships. In turn, the public service is indeed benefitting from its investment, since data shows that beneficiaries are subsequently better skilled, have a higher propensity to innovate, and are more productive, all of which may indicate a substantial contribution to the efficiency of the public service. Lastly, data also reveals that sponsored education is a public good that results in positive spill overs within society in general, resulting in higher social outcomes: from our study, increased education leads to better health, increased social cohesion, and more environmental awareness.



Recommendations

On the basis of the results and subsequent analysis, four main recommendations are presented for the consideration of policymakers. All of these are specifically designed to reform and improve the IPS scholarship scheme.

Recommendation 1:

Link scholarship grants with the priorities and needs of the public service.

Every firm or organisation disbursing its funds to train and equip its working with skills, be they general or specific, has to ensure that the training and the skills obtained reflect its priorities and needs, depending on its gaps in skills and on its projected operations. Otherwise, without such organisation, mismatch in skills occurs, and the firm cannot obtain the full value of its investment back. While IPS applicants have to have their applications approved by their department or ministry, there exists no systemic exercise to ensure that the IPS scholarship scheme, which is funded by taxpayers, is geared to meet the strategic priorities and needs of the public service.

In view of this IPS, in collaboration with the leadership of the public service, should define priority areas in which the service requires upskilling, in view of

constantly changing technology and strategic needs.

Once the service's priorities have been defined, the IPS is well placed to in turn set up a system to link the scholarship grants with these priorities. A way of doing this would be to, ex-ante: i) request applicants to justify their scholarship application in the light of the public service's priorities and needs; ii) request beneficiaries to focus their end of degree research on a subject linked to the public service and its priorities.

Defining its priorities and implementing these mechanisms would permit IPS to direct its scholarship funds towards plugging the public service's skill-gaps and ensure that it is well equipped for its future endeavours.



Recommendation 2:

Facilitate the matching of retrained workers with corresponding positions.

To train and equip workers according to the priorities of the public service is a significant step forward. However, in an imperfect labour market with inherent information asymmetries, it is crucial that the public service, the largest employer in Malta, ensures that its retrained workers are matched with the positions in which their skills are required, so that it avails of the skills for the development of which the funds were disbursed in the first place.

A way to tackle possible information asymmetries hindering the matching of developed skills with corresponding positions within the public service would be for IPS to collaborate with the public service's human resources section, providing it with information about beneficiaries and their studies. Such information sharing mechanisms would allow Human

Resources to be better informed about its changing workforce and its skills-pool, permitting it to take on the role of facilitating the internal mobility of retrained labour within the public service. Whether it is with the human resources section or with any other pertinent department of the Maltese public service, it is crucial for IPS to ensure that its relevant partners are well informed of its work and its investments.





Recommendation 3:

Conduct ongoing evaluation of the scholarship programme

To ensure that the scholarship programme is effective and bearing fruit, IPS should set up an evaluation system. This could consist of i) ex-post surveys with beneficiaries to allow them to provide valuable feedback on the programme; ii) short and long term follow-up of a pool of selected beneficiaries in order to evaluate how retrained workers are being helped in the best possible manner to employ their skills in the relevant departments or positions; iii) constant internal consultation with relevant public service departments in order to obtain pertinent feedback on whether the scholarship programme is being effective in addressing the public service's needs, and on how the scheme can be improved and finetuned.

Recommendation 4:

Facilitate international exchange programmes

International exchange programmes, the most successful example probably being Erasmus+, serve not only to exchange knowledge, but perhaps more importantly to change attitudes related to work ethic and practices, as well as cultures. The world is becoming increasingly globalised and multicultural, and Maltese society is no exception, and eventually the public service will have to adapt in order to continue reflecting the society in which it is embedded.

A successful way of reaping these benefits would be to encourage beneficiaries to participate in international exchange programmes in the form of placements within companies, foreign public services, or universities. This will not only guarantee that the Maltese public service obtains new input in the form of ideas, insights and knowledge; it will also ensure that civil servants are able to work and interact in a multicultural and multilingual setting at a time when collaboration among European public services is required more than ever.

Conclusion

This study sought to provide the first systematic analysis of the impact that investing in education has on beneficiary employees, employers and society by taking the IPS scholarship scheme offered by the national government to civil servants in order to further their education, obtain better qualifications, and improve their human capital and skills.

While understanding the impact of education is crucial from a public policy and management perspective, exploring whether the IPS scholarship scheme is indeed efficient is rendered perhaps even more pertinent by the fact that the grants are financed by the Maltese taxpayer.

A survey circulated to scholarship beneficiaries found that further education results in increased earnings, enhanced job prospects, and improved job satisfaction. Beyond the individual benefits, it also emerged that when employers invest in their employees' education, they have access to workforce that is more skilled, innovative, and productive. Finally, the study explores possible externalities spilling over to the remainder of society; we demonstrated that there exist positive links between educational investments and a more democratic and open society, one that is more conscious of the environmental challenges we face and of the importance of wellbeing and health.

From a public policy perspective, these findings are significant and will help policymakers and firm managements to adopt informed strategies to employ education at the service of employees, and Maltese

firms and society in view of its demonstrated benefits for the Maltese economy and society in general. Furthermore, these findings, which imply that the firm and society are deeply interlinked, should encourage policymakers and firm managers to come together in order to harness the full extent of the benefits resulting from invested education.

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Short Research Reports by Public Service Officers



An Impact Assessment for Implementing a Compressed Working Week for Office-based Workers in the Maltese Public Service

Myrna Azzopardi



Compressed Working Week

Productivity

Management

Impact Assessment

Work-Life Balance

Introduction

The rationale behind this research project was rooted in exploring the implementation of a compressed working week (CWW) in the Public Service by examining measures of productivity and stakeholders involved to derive an impact assessment (IA) on the most feasible policy options.

The concept of a CWW adopted was of working the requisite number of hours for less than the traditional 5-day week. This research focused on office-based workers as they are more consistently linked to the typical 5-day week work pattern.

Within the Public Service, officers typically work 43.75 hours during the winter schedule to benefit from a shorter 30-hour working week during summer (Public Service Management Code, Office of the Principal Permanent Secretary, 2020). This is a long-held tradition dating back to when Malta was still under British rule (Office of the Prime Minister, 1974) but reflects an established openness to the idea of a compressed working schedule.



Research Objectives

The research question explored was: Could a more widely implemented CWW in the Public Service be adopted without detriment to service delivery? The answer was presented in the form of a policy IA.

IAs are rooted in evidence-based policy-making. Their aim is to bring a rational and scientific approach to the complexities of issues and the various relationships of stakeholders. The IA reveals “who is affected, the magnitude and the cause of effects” (Großmann et al., 2016, p. 11).

Literature Review

If the CWW is not perceived in a positive light beforehand, it will be deemed unsuccessful post-implementation (Arbon et al., 2012). Input from employees is always essential for this measure to succeed (Arbon et al., 2012). Acceptance of the CWW depends on the person’s preferences, inclinations, and capabilities (Golden, 2011). For service users, implementation is negatively perceived if services are deterred or if they esteem it as another perk of working within the Public Service (Arbon et al., 2012).

The only truly comparable case study of a CWW carried out within the public administration for which detailed follow-up research was found is an experiment conducted within the state of Utah, United

States, between 2009 and 2011, where a 40-hour work week was maintained over four days. 17,000 state employees worked from Monday to Thursday (07:00 – 18:00). A report presented by the Office of the Legislative Auditor General State of Utah (2012) found that results were not overwhelmingly positive. However, regularised performance measures were not in place to act as objective standards. Some employees reported increased employee morale, less interruptions during the working day, and better management of their personal business by transferring personal errands to Friday. Clientele reported that they benefitted from the extended opening hours while others opined that government services were not available on a Friday. Certain departments were not found to be well-suited to a CWW, such as the Department of Agriculture and the Department of Community and Culture, as both departments cater to activities which are not naturally office-based and would very much require an element of adaptability to cater to client needs.

Wadsworth and Facer (2016) conducted a post-implementation survey with Utah public employees and found the results to be predominantly positive. Employees reported higher levels of work-life balance. However, employees with children reported a greater negative reaction, with unplanned family needs causing the most stress for parents.



Benefits	Drawbacks
Increased performance ratings on behalf of employees (Baltes et al., 1999)	Greater difficulty in scheduling meetings and interaction (Wadsworth and Facer, 2016)
More efficient customer service provided (Wadsworth and Facer, 2016)	Increased levels of fatigue in employees (Hyatt and Coslor, 2018)
Greater levels of job satisfaction reported by employees (Baltes et al., 1999)	
Employers reporting a demonstrated better sense of autonomy in employees and responsibility from employees (Arbon et al., 2012)	
A decrease in absenteeism (Ronen and Primps, 1981; Deery et al., 2017)	
Reduction in commuting costs (Ho and Stewart, 1992)	
Less emotional exhaustion, stress and anxiety (Deery et al., 2017)	
Improvements in work-life balance (Hyatt and Coslor, 2018)	
More leisure time (Pullinger, 2014)	

Table 1 displays the benefits and drawbacks found in literature pertaining to the implementation of the CWW. While the benefits seem to significantly outweigh the drawbacks in the table above, it is important to note the methodological limitations of these studies, most notably that research on the CWW is carried out within wider studies on flexitime or alternative working schedules as if they are all interchangeable.

Table 1: Benefits and drawbacks of the CWW found in academic research





Method

Structured interviews were carried out with key stakeholders who are crucial in implementing such a measure in the Public Service, as well as private stakeholders who would have a vested interest. Thirteen elite interviews were carried out.

The topics covered in the interviews included the likely reaction of office-based workers to the implementation of a

CWW, the benefits to employee wellbeing, gender-related issues, productivity, and the practical implementation, especially in light of the Public Service practice of ‘banking of hours’ for the summer months.

Subsequently, a survey was issued to 95 employees within the People & Standards Division. The aim of the survey was only to provide indicative employee feedback—it did not aim to represent all issues for office-based workers within the Public Service.

The data and issues elicited from these interviews and survey underwent a thematic analysis as

proposed by Braun and Clarke (2006) and, finally, presented as a policy IA in order to identify the most feasible option. Six policy options were identified. A weighted decision matrix was used to choose the best policy option. Of the six policy options, the majority were proposals for a new system of work and would be applied across the board to all departments/directorates who adopt the system. The sixth was a proposal for the CWW to be adopted as a work-life balance measure and, therefore, to be taken up by singular employees.

Results

Thematic Analysis of Interviews

The above thematic map presents the principle themes and sub-themes found within the thematic analysis. While the majority believed that such a measure would be welcomed, certain issues were identified which may lead to resistance, including the increase in daily hours and the possible decrease in overtime. In terms of productivity and service delivery, it was repeatedly mentioned that a paradigm shift towards a task-oriented culture would be necessary. Managerial flexibility was frequently mentioned as pivotal for success, including clear communication on expected outcomes; means of addressing circumstances when targets are not met and; standard operating procedures for continuity and handovers on ‘days off’. Digitalisation and job shadowing would also play an essential role.

Significant emphasis was placed on the effects on mental health and

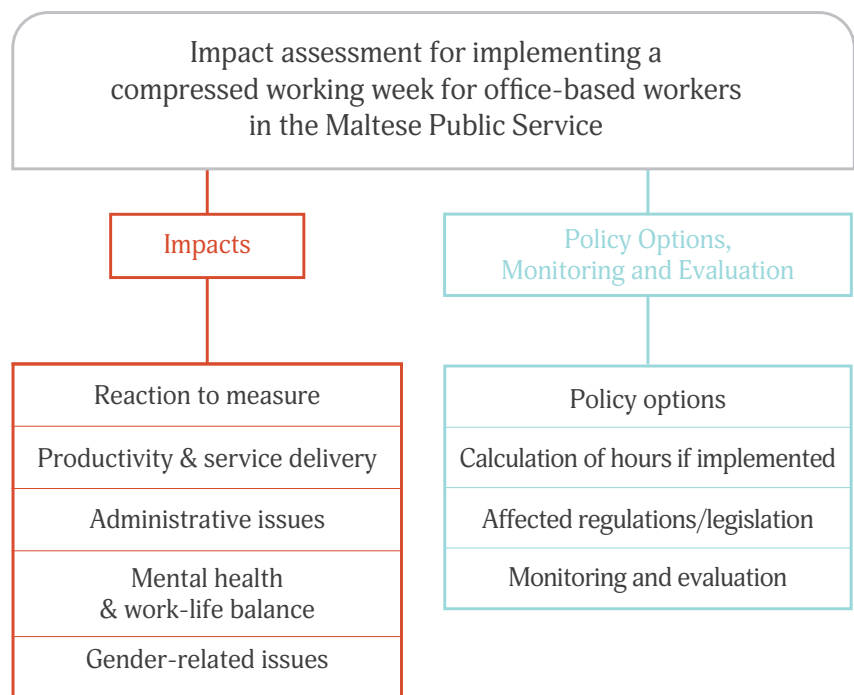


Figure 1: Thematic map

work-life balance. For employees, a significant positive impact of the CWW would be less travelling time. Conversely, negative outcomes could include a decrease in the availability to carry out part-time work. This is potentially countered with greater flexibility due to the aggregated time off to carry out extracurriculars. However, for employees to truly be able to enjoy this, the right to disconnect from work would need to be safeguarded.

Many agreed that this measure would help incentivise women to increase their working hours, as it offers yet another flexible option. However, the CWW would significantly disrupt valuable after-school hours. Nevertheless, this measure could help to challenge stereotypes and encourage men to take on more family-related roles, given the increased free time at the weekend.





Survey Responses

Qualitative answers within the survey supported the issues which were discussed during the interviews. No further major issues were raised. The reactions in the survey were predominantly positive. Almost 40% believed that the CWW would improve employee morale and work-life balance. Of particular note were the considerations that a CWW could further encourage adherence to deadlines; that the extra 'day off' would act as an incentive, especially since working after normal hours is often necessary, and that the longer hours would result in better time management.

When asked to list the potential negative impacts, the majority listed daunting long hours, fatigue, and having to carry out a week's worth of work in four days. Some mentioned that this measure would leave less time to care for children or elderly parents in the evening.

When it was emphasised that a CWW would likely mean working standard hours in winter and summer but having a shorter working week throughout, the majority (61.9%) still claimed they would consider adopting a CWW.

Policy Options Matrix

A policy options matrix with weighted criteria was drawn up and awarded. Each policy option was ranked from 1-5 on a scale of Low, Fair, Medium, High, Excellent. Below is a summary of the ranking and justifications for each policy option when compared to the status quo.

The existing literature focuses on post-implementation effects, whereas this research study acts a pre-implementation scoping exercise. The existing literature unfortunately rarely hones in on the specific nuances of the CWW. The strength of this research project is doing so through highly effective but rarely used methodologies such as thematic analysis and impact assessment. The impacts which have been discussed both by high-level professionals as well as employees and the identification of stakeholders all contribute to a detailed rundown of this measure.

Ranking	Policy Option	Total Points Awarded
1	Adopting a CWW only during the Summer Schedule	95
Minimal changes required except the adoption of a roster system. Wide acceptability and increased employee motivation make this the most acceptable option. In terms of efficiency and effectiveness, it motivates employees by means of a further reward during the summer schedule with minimal disruption to service delivery.		
2	The 'day off' is not worked at the office but from home.	87
This policy option takes the lessons learnt from the recent COVID-19 remote working circumstances and applies them to the idea of the CWW. Its challenge lies in the effectiveness of establishing a new norm.		
3	The CWW is introduced as a work-life balance measure.	65
While this measure would benefit singular employees, resistance from management and other employees may be exercised.		
4	A CWW is implemented on the basis of a 40-hour week all year round.	62
Increasing the hours so significantly in summer marks the downfall of this policy option which would meet too much resistance to succeed.		
5	A CWW is implemented with the day off potentially being used to accumulate any overdue hours if necessary	55
Though slightly more beneficial than the worst ranked option, this measure is still too complex to implement.		
6	A CWW is implemented while maintaining the system of working longer hours in winter and shorter hours in summer	51
The high levels of fatigue and the low levels of acceptability outweigh the benefits reaped from this option.		

Table 2: Policy Option Matrix

Recommendations

The first step for implementation would be to present and discuss the results with internal stakeholders and unions. While one policy option was more favoured, the others should not be completely discarded. For example, incorporating remote working has its merits. A working committee should be charged with regularly analysing the results, providing progress updates, and re-assessing the way forward.

Wider pre-implementation surveys with managers and employees should be conducted, as well as a scoping survey with service users. Sections which are already carrying out this measure during the summer schedule should particularly be consulted. Future research would need to consider attitudes; personal relationships especially with dependents; unplanned demands; any age/ sex differences; differences in sections or grades; and most significantly visible impacts on service delivery and productivity. Such surveys should be conducted on a larger scale and over different periods of time, during both winter and





summer schedules, to be able to compare and contrast findings.

Concurrently, lengthy discussions and drafting of strategic plans will need to be carried out on the mechanisms which will be adopted for monitoring and evaluations. This should not be restricted to managerial levels. Such plans will need continuous revision depending on the findings at each stage.

Following the review of responses, pilot studies are to be initiated in identified departments which do not yet implement the CWW. Such studies will especially need to focus on attitudes of employees/management and the monitoring/evaluation mechanisms adopted.

Conclusion

The motivation behind this research project was the ever-growing emphasis on emerging work trends which can better address dynamics in work-life balance. This research culminates in a weighted policy option matrix which gathered impacts and options in order to identify the most feasible option to implement the CWW as a new work system and not as a work-life balance measure.

It bears noting that the bulk of the research was carried out during the outbreak of the COVID-19 pandemic in the spring of 2020. Subjects were demonstrably open to new systems of work and, within the context of this study, this served for especially constructive dialogue.

This research challenges the concepts of productivity and moves away from the idea that the measure of output is 'hours clocked'. It is a preliminary stepping stone into a paradigm shift and a necessary reconsideration of the future of work.



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