Efficient business processes lie at the heart of a successful enterprise, solving management mismatches that can disrupt a system’s performance, says Dr Jun Yan.

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t the heart of any organisation is a set of business processes which organisations use to co-ordinate and arrange activities, information and knowledge for a product or service. Efficient management of these processes has become paramount to the agility and success of the organisation as a whole.

Over the decades, process management technologies have evolved from manual routing of folders and documents into general purpose workflow management which enables business process automation, using information and communication technologies. Workflow management provides the capability to model and document business processes, automate process execution, track and log events, integrate various enterprise resources and incorporate external tools and applications. Consequently, as observed many times, workflow management brings an enterprise wide benefit such as streamlining formerly inefficient procedures, reducing costs and flow time and increasing the quality of service and productivity.

These benefits undoubtedly can place an enterprise in a position with competitive advantages. Research and development in the workflow management area has been recognised as one of the most important areas in IT research communities and industry and offers significant national benefits.

I started researching this area in 2001 when I was a PhD student at Swinburne University of Technology in Melbourne. My research motivations were to explore the reasons why some attempts at using workflow management in support of business processes failed and how it could be improved in an open environment such as the internet.

Working closely with my supervisor, Professor Yun Yang, I found that conventional workflow management approaches based on the popular client-server model unfortunately mismatch with the workflow’s dispersed nature.

This mismatch results in unavoidable problems such as poor system performance, vulnerability to failures, limited scalability, user restrictions and unsatisfactory system openness, which have become major obstacles for side deployment of workflow management in the real world.

To address these problems, I integrated the workflow technology and the peer-to-peer computing technology and proposed a novel approach which offers decentralised workflow management.

The new research approach is named Swinburne Decentralised Workflow (SwinDeW). The key idea of SwinDeW is to minimise the use of a centralised server in the workflow management by appropriately distributing essential data and control capabilities to participating peers so they become autonomous and self-managing. By exchanging semantic messages directly among peers, various workflow functions can be achieved. The initial results, as demonstrated in a proof-of-concept prototype, are promising.

Performance bottlenecks are eliminated, while increased resilience to failure, enhanced scalability, improved user support and system openness are likely.

As more enterprises move towards the emerging Service-Oriented Computing (SOC) paradigm, I have put my efforts on workflow management in the web services environment.

As a natural extension of my PhD research, I am now working with Prof Yun Yang and Prof Ryszard Kowalczyk, both from Swinburne, on a large, inter-institutional project. The project, titled Agent-based Co-ordination and Negotiation Technologies for Decentralised Workflow Management, has attracted around $250,000 from Australian Research Council’s Discovery Projects.

The expected outcomes will assist many organisations to effectively develop and deliver more efficient, reliable, flexible and adaptive business applications, using web services as fundamental elements.

*Dr Jun Yan*A

Dr Jun Yan is a lecturer at the University of Wollongong’s School of Information Technology and Computer Science.

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**Q&A**

Will it save the world? No, but it will significantly improve the productivity and competitiveness of workplace enterprises.

Are you getting anywhere? Yes. Research problems have been analysed computationally. New approaches have been proposed, developed, published and recognised.

Have you had a true “Eureka! I’ve found it!” experience? No. No breakthrough happened overnight. The mystery of the research is unravelled gradually.

What did you want to be when you were a kid? A postman.

As an optimist, I believe man will survive. As an empiricist, I believe man will fail and the price of failure will be awareness without which we shall not learn.

From a global viewpoint it is insignificant, just one more example of the destruction of the balance of nature by man. Yet an example on our doorstep of the irreversible upsetting of the delicate balance of nature which can result in environmental damage which has consequences now for those who live now but for all generations.

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**Research**

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