Journal of Intellectual Property Rights
Vol 19, May 2014, pp 177-188

Intellectual Property Ownership Model in Academia: An Analysis

Nasiibah Ramli and Zinatul Ashiqin Zainol†
Universiti Kebangsaan, 43600 UKM, Bangi Selangor, Malaysia

Received 22 December 2013, revised 30 April 2014

University ownership model of intellectual property rights (IPR) has been widely used by universities around the world. With the new awareness of the importance of IPR, universities are keener to obtain ownership of any intellectual property (IP) created within the university in order to ensure smooth technology transfer and commercialization of the IP. This paper analyses other models of IPR ownership in order to boost invention and innovation within Malaysian research universities. Through the most appropriate ownership model for universities, it is expected that revenue generated from the university IP could be used to fund new research at the universities. However, with all the excitement to commercialize the university IP, inventors sometimes are left with little benefit from their inventions which dampen their motivation to continue with research and produce more new inventions. Malaysia as an emerging economy actively seeking to encourage university invention, commercialization and entrepreneurship, should experiment with different models of intellectual property ownership/commercialization.

Keywords: Intellectual property ownership, university invention, employee invention, Bayh-Dole Act

It is well documented that universities today have assumed an expanded role in science and technology,[1,2] with the emergence of the entrepreneurial university, where universities venture into commercialization activities of academic research and development (R&D).[3-6] In recognition of the importance of innovation in contributing to a country's economic development, the World Trade Organization has emphasized on the importance of intellectual property rights (IPR) in ensuring successful innovation and commercialization.[7] Several other studies have reaffirmed the importance of IPR in innovation.[8-13] Intellectual property rights or specifically patents are perceived as a prerequisite in negotiating royalty share and sales price of university intellectual property (IP).[14] As a goldmine of technology development and scientific discovery for entrepreneurial activity, it is imperative that universities enter into commercialization activities only after issues of intellectual property ownership are legally resolved as attempts to enforce any IP with ambiguous ownership could ultimately render it void or unenforceable.[15] This paper, however, does not deal with the intricacies of commercialization activity possible at universities.

Clearly, ownership of IP is important to both the employer and the academic employee.[16] The university ownership model allows universities as employers to obtain ownership of all IP created by their employees on the reasoning that they employ the inventors and provide resources for the invention.[17] At the same time, the inventor ownership model allows academic employees who are the original inventors or creator to own and contest their employers' claim of IP ownership.[18]

This paper compares two models of university IP ownership i.e., university ownership versus inventor ownership. The university ownership model which follows the general principle of employer-employee ownership principles and is legislated in the US through the Bayh-Dole Act which gives universities ownership of IP resulting from research funding sponsored by the federal government, has not resulted in the expected results for universities outside the US.[9,19-23] On the other hand, the inventor ownership model which has been practised sparsely has shown promising results in supporting the entrepreneurial objectives of universities.[24]

In order to compare the university ownership model and inventor ownership model of IP, several institutional intellectual property policies from ten universities in the US, UK and Australia are analysed and compared. The universities are taken from the list of top 200 universities of The World Universities Ranking 2011-2012 (THES) in order to analyse IP policies of the acknowledged world's best universities. All the selected 10 universities adopt the

†Corresponding author: Email: shiqin@ukm.my

university ownership model. A specific example of inventor ownership model is analysed as well, namely, the University of Waterloo in Canada which is acknowledged for its entrepreneurial capacity although it is not listed within top 200 universities in THES 2011-2012. Nonetheless, according to Kenney and Patton, the University of Waterloo is the most successful entrepreneurial university which applies the inventor ownership model.[24] The purpose of choosing five universities from US, three universities from UK, and two universities from Australia is to show that university ownership model of intellectual property has wide acceptance all over the world while the inventor ownership model has not been popularly practised. The University of Waterloo has been mentioned several times in various studies as a good example of an university applying the inventor ownership model[18,24-27] and thus chosen for comparison between these two models of intellectual property ownership. Also, a Malaysian perspective is added by analysing the institutional IP policy of the five Malaysian research universities taking into account the Malaysian development to garner country's innovation through acknowledgement of five public universities as research universities.[28]

University Ownership Model

Most universities adopt the university ownership model[18,24] which gives ownership of all inventions or creative works to the university. University ownership model was spurred by the enactment of the Bayh Dole Act in 1980 (ref. 18) which granted universities in US a statutory right under 35 USC § 201(e) to own all inventions resulting from the research funded by the federal government[26,29,30] particularly when the academic employee is hired to perform his inventive abilities.[31,32]

With regard to employee invention created in the course of employment, there is a landmark case in US which sets precedent to the rule on ownership of IP. In *United States* v *Dubilier Condenser Corporation*,[33] two scientists employed in the radio laboratories of the Bureau of Standards, Dunmore and Lowell were assigned to do research and testing on the subject of 'radio airplane'. However, during their research they made discoveries concerning the use of alternating current to broadcast receiving sets which was not related to their assigned task. Dispute arose concerning three patents related to the inventions and the government contended that since the scientists were their employees, they were the rightful owners of the invention. The Court held that, 'One who is employed to invent is bound by contractual obligation to assign the patent for the invention to his employer' and upon the fact of the case there was no indication of the employment to specifically invent and there was no basis for the court to imply that there was a contract to assign the invention to United States. Therefore, this decision implied that it was important for the employer to establish that the employee was hired to invent in order to contractually obligate the employee to surrender his invention created during course of employment.

An academic inventor is an employee to the university and thus any invention created by the academic inventor which he has been hired to invent accrues to the university. However, in the case where there are no contractual terms which hold that the employee is hired to invent then the academic employee may own the inventions created during the course of their employment.[34,35] But in most cases, there are an express contract between the university and the academic inventor vesting the ownership on the former.[36-38] In the absence of a clear contractual provision establishing ownership of inventions on the employer, the Court would not read into the agreement for any assignment of rights to the employers.

For instance in case of *Joany Chou* v *The University of Chicago and Arch Development Corporation*[39], Chou was a PhD student at the University of Chicago's Department of Molecular Genetics and Cell Biology. After obtaining her PhD, Chou became a post-doctoral research assistant to Dr Roizman. It was alleged by Chou that when she consulted Dr Roizman regarding her innovations that should be patented, Dr Roizman disagreed. However, Dr Roizman had filed for a patent on the allegedly same disputed inventions and assigned the patent to Institut Merieux. Chou sued the defendants for correction of inventorship under 35 USC § 256, where she sought to be named as the sole inventor or a joint inventor on three patents relating to the herpes simplex virus. Chou charged the defendants with fraudulent concealment, breach of fiduciary duty, unjust enrichment, breach of express and implied contract, and academic theft and fraud. The Federal Court held that with regard to unjust enrichment by the university which was employer to the plaintiff, Chou was obliged to assign the invention to the university as per university's patent statute (Section 20) which stated that:

'Every patentable invention or discovery that results from research or other activities carried out at the University, or with the aid of its facilities or funds administered by it, shall be the property of the University, and shall be assigned, as determined by the University, to the University, to an organization sponsoring the activities, or to an outside organization deemed capable of administering patents.'

The Federal Court further held that the basic terms and conditions of employment contract between Chou and University stated that the appointment was subject to 'the administrative policies of the University,' which included university's patent statute. Therefore there was no unjust enrichment by the university since the university would have the same entitlement had Chou been named as inventor or co inventor in the patent.

Through the Bayh Dole Act of 1980, universities have taken for granted that rights to an academic inventor's inventions created during the course of employment are vested in the university. However in the case of *Board of Trustees of the Leland Stanford Junior University* v *Roche Molecular Systems Inc*[40], the court held against Stanford University. In this case, dispute arose regarding an invention of method for quantifying the human immunodeficiency virus (HIV) in a patient's blood created by Dr Holodniy, an employee of Stanford who had signed an agreement to assign to Stanford his right, title and interest in inventions resulting from his employment with Stanford. During his research, Dr Holodniy joined another research group at a company named Cetus in order to learn about a method known as PCR used for quantifying blood-borne levels of HIV developed by Cetus. As a condition for joining Cetus, Dr Holodniy assigned to Cetus his right on any invention or improvement he made as a result of his access to Cetus. During his time at Cetus, Holodniy devised a PCR-based procedure for calculating the amount of HIV in a patient's blood. Later, upon returning to Stanford, Holodniy continued to test the method and Stanford obtained three patents for the method. In 1991, Roche Molecular Systems obtained Cetus's PCR–related assets and commercialized the procedure. Stanford claimed that Roche had infringed Stanford's patents. The main issue in this case is whether Dr Holodniy as an employee of Stanford could assign his right in invention to another party, namely, Cetus?

The court held that, Bayh-Dole Act does not negate the right of an inventor employee to own his invention that was accomplished during the course of employment and that he could assign the invention to a third party. Thus, 'Unless there is an agreement to the contrary, an employer does not have rights in an invention which is the original conception of the employee alone. Such an invention remains the property of him who conceived it. In most circumstances, an inventor must expressly grant his rights in an invention to his employer if the employer is to obtain those rights'.

Notwithstanding such presumption, the employer may still have a right to the invention so long as the invention is created during employment and uses the employer's material and appliances, hence the employer has a 'shop right' which is a non-exclusive, nontransferable, royalty-free licence to use the invention. The 'shop right' doctrine has been used in the case of *United States* v *Dubilier Condenser Corporation*[33] where the court held that:

"Where the contract of employment does not contemplate invention, but an invention is made by the employee during the hour of his employment and with the aid of the employer's materials and appliances, the right of patent belongs to the employee, and the employer's interest in the invention is limited to a nonexclusive right to practice a 'shop right'."

It should be noted that the 'shop right' doctrine is only applicable in the United States.[34] Thus, the same rule on ownership of IP by employee also applies to the university settings. Besides, universities are also given blanket permission to own IP resulting from research funded by government by virtue of provisions under the Bayh-Dole Act 1980. However, the Roche Molecular Systems case made it clear that the Bayh-Dole Act does not automatically give right to the university to own invention created by the academic employees. This has in turn given rise to the practice where the academic inventors are required to sign an assignment agreement which assign the invention created by the academic inventor during the course of employment to the employer, namely, the university.

Outside the USA, the university ownership model is also prevalent in Australia, United Kingdom and Malaysia. Australian universities apply the university ownership model since under Australian law, ownership of invention depends on the contract of employment, whether the said invention falls under invention made in the performance of the employee's

duties and whether the employee has the duty to invent as laid down in the case of *University of Western Australia* v Gray.[41] In this case, Dr Gray was appointed as Professor of Surgery by University of Western Australia (UWA). Under terms of employment he was required to (1) teach, conduct examinations and direct and supervise the work in his field; and (2) undertake research, organise research and generally stimulate research among the staff and students. The dispute was regarding ownership of IPR generated by Dr Gray during his course of employment with UWA. The university claimed that ownership of the patent of the inventions accrued to the university since the invention was developed in the course of employment. The Federal Court held that there was no express clause in the contract of employment which stated that Dr Gray had a duty to invent. The contract only stipulated that Dr Gray had a duty to perform research which was concluded not to include duty to invent. The Federal Court also denied the UWA claim to presume an implied term of duty to invent by academic staff who perform research and use university resources to develop an invention. Therefore the court held that Dr Gray owned IPR to the inventions developed while he was working with UWA. Significant point highlighted in this case is that in determining ownership of intellectual property rights developed by university academic staff, there lay a distinction between a university and a private entity wherein university is governed by 'academic freedom'.

Most universities have developed institutional IP policies which stipulate rules on management of IP created within universities. These rules cover a wide range of subject matter including rules on ownership and commercialization of the IP. For the scope of this paper, only few IP policies from ten top universities in United States, United Kingdom and Australia are selected to give an overview of the ownership model practised within these successful universities. In addition, the IP policy of the Waterloo University in Canada is also examined to give a picture of inventor ownership model and provide comparison between the two models of ownership.

Table 1 summarises intellectual property ownership rules provided by the IP policy of five universities in the US i.e. Harvard University, Massachusetts Institute of Technology (MIT), John Hopkins University (JHU), Princeton University and Stanford University.

From the table, it is clear that the rules applied by each university towards determining ownership of IP created is more or less the same. The only differences that can be seen from the above IP policies are the terms used to elaborate the rules. For example, Harvard University frequently used terms like 'supported invention' and 'incidental invention' which denotes the significant use of university resources and support.

The Table 2 summarises the IP policy for Cambridge University, Oxford University, Imperial College London, Australian National University and University of New South Wales.

Ownership principles applied at these five universities are also almost similar to the provisions present in the US universities and signify university ownership model where university owned all IP created in the course of employment and also where there is significant use of university resources. Universities are very strict with regard to inventions created by their employees and claim all rights in the invention if it originated in the course of employment or by substantial use of university resources and facilities. However, in case of copyright, universities tend to confer ownership to their employees except in the case of works specifically commissioned by the universities. However, universities retain worldwide non-exclusive licence to use the work. As for IP created by visitors, the above IP policies differ ranging from assigning IP to university to contracts to common rules as for employees, etc. Nonetheless, all these rules represent university ownership model.

Thus one may deduce that under the following circumstances, the inventors (be it staff members, students or visitors) own the IP:

(a) No specific resources or facilities have been made available by the university for the purpose of creating intellectual property;

(b) No existing intellectual property owned by the university has been used or has been inseparably mixed with the newly created intellectual property; and

(c) No agreement between the university and third party or any other arrangements with regard to intellectual property which stated to the contrary, exists.

In addressing the issue of IP generated by employees at the university, many questions have to be clarified first. Basically, the law stipulates that IP created by the employees during the performance of his contract of employment is the property of the employer. The same is the case for universities and

Table 1 - IP ownership at US universities

University	Harvard University	MIT	JHU	Princeton University	Stanford University
Provision under the policy	Sections I (c) and Section II (a)	Para 13.1.1	Part IV	Chapter VIII Part D	Section 1 (a) (b)
Ownership of patent created by employee	1. University owns the right to 'supported invention'* created by employee where there is agreement with 3rd party or there has been more than incidental use of university resources and also work made for hire 2. Inventor shall retain ownership of 'incidental invention'**	University owns patent created in the course of employment, using university resources or developed in the course of sponsored research	Inventor is the owner of IP except in cases where university support is used in the creation 2. Where university refuses ownership of IP, all rights revert back to the inventor	1. University owns the IP if research funded by the university or invention made in the course of employment or if it is developed through utilization of university resources 2. Inventor is the owner if above three conditions not fulfilled. 3. Inventor may own IP if commercial exploitation of invention not warranted	1. IP created in the course of employment vests in the university 2. University owns an invention made by using more than incidental use of university resources
Ownership of copyright created by employee	Copyright is owned by the author except in circumstances where there is an agreement with 3rd party or there is more than incidental use of university resources and the work is 'made for hire'	Copyright is owned by the university if it is created under 'work made for hire' or university support is used in the creation of the work	Author owns copyright except where university support is used in the creation of the work	1. University owns copyright in work falling under specifically assigned duty. 2. Inventor has irrevocable and non-assignable rights for copyright while the university retains non exclusive, irrevocable, worldwide licence to exercise such copyright	All rights remain with the creator unless: (a) the work is work made for hire. (b) the work is funded by the university (c) the work is commissioned by the university or (d) the work makes significant use of university resources
IP created by students	University owns invention under category of 'supported invention' while the student owns IP created under category of 'incidental invention'	Rules stipulated for university staff also applies to students	Same principle as mentioned above is applicable for students	The same rule as mentioned above applies to students	1. Provision on patent policy for staff is also applicable to students 2. IP created using a substantial amount of university resources is owned by the university
IP created by visitors	University owns invention under category of 'supported invention' while the visitors own IP created under category of 'incidental invention'	Inventor owns IP if: (a) not developed in the course of sponsored research (b) not created as 'work-for- hire' (c) not created with significant use of university resources	Same principle as applies to employee	-	University owns IP if: (a) IP created in the course of their participation in research (b) there is more than incidental use of university resources

*: 'Supported invention' is an invention created under agreement between Harvard and third party and invention using financial support and other facilities of Harvard

**: Incidental invention' is an invention created by incidental use of university resources

Source: IP policy of the five universities

Table 2 - IP ownership at UK and Australian universities

University	Cambridge University	Oxford University	Imperial College London	Australian National University	University of New South Wales
Provision under the policy	Para B	Part B	IP ownership	Part 3	Section 4
Ownership of patent created by employee	1. University/its nominee Cambridge enterprise own IP rights 2. Creators will be named in the application	University owns all IP created in the course of employment	1. University owns IP created in the course of employment 2. IP of work commissioned by the university owned by the university	University owns IP created: (a) in the course of employment (b) using university resources or existing IP owned by university (c) which according to university law is owned by it	Employee must assign to the university all IP created: (a) in the course of employment (b) using university resources (c) using existing IP owned by university
Ownership of copyright created by employee	Copyright is owned by the creator unless where the university commissioned such work	1. University owns copyright created using university aids except for statutes, books, articles, plays, lyrics, scores or lectures 2. University owns copyright in work commissioned by the university	1. Copyright of work created in the course of employment belongs to the university 2. Work commissioned by the university is owned by the university	1. University assigns copyright of scholarly works created by employee to the employee 2. University retains worldwide non-exclusive licence to use course material	1. University does not assert ownership unless: (a) specifically commissioned by the university (b) work is created using university resources
IP created by students	Students own IP created by them except in a situation where: (a) there is an overriding third party agreement (b) IP is created jointly with other researchers (c) the new IP depends upon existing university IP	1. University owns IP created in the course of or is incidental to the study. 2. Students own right to thesis, exercises and answers to test/ examination	1. Students own IP created in the course of their study except where there is agreement to the contrary 2. Where student is in the position of employee, rule of employee ownership will apply 3. Where IP arises from existing IP, it is owned by the university	1. University may acquire IP created by students: (a) in the course of research/study (b) using university resources/ existing IP (c) using external funding given to university	1. University does not assert ownership except: (a) in teaching materials (b) where student assigns IP to university under agreement (c) where IP is jointly developed by university staff (d) when subject to assisting agreement with 3rd party
IP created by visitors	Ownership of IP depends on the agreement entered by both parties	Visitors are also bound by the same rules as condition of being granted access to universities' premises/ facilities	Visitors may be required to assign IP created in the course of university activities	University may acquire ownership for IP created: (a) in the course of research/ teaching (b) using university IP (c) using fund provided for university by outside party	University owns IP created: (a) using university resources/ funds (b) using background IP owned by the university (c) by a team including university staff

Source: IP policy from the five universities

their employees. Yet, there are aspects in ensuring the validity of the ownership of IP, which lead to ambiguity as pointed out below:

(a) Are university employees hired to do research and invent?

(b) Does an employment contract specifically provide that employees agree to assign their IP rights to the university?

(c) Does the use of university facilities resulting in the IP produced by employees belong to the university?

(d) Does university IP policy have the effect of an implied contract on the employee?

All the above questions have to be answered according to the circumstances of the cases since there is no concrete rule on this issue. As for the first question, there have been cases that have illustrated that employee hired to do research is not necessarily the same as hired to invent – here, when the employee successfully develops something new, his employer cannot assert the right to own the invention since it was not created in the course of employment. This was decided in the *Dubilier Condenser* case and in *Building Innovation Industries LLC* v *Yelena Onken*.[42]

The second question is also important where the employee invention does not fall in the category of invention created in the course of employment. In this case, the employee as the first owner of the invention must agree to assign the IP to his employer in order to validate the employer ownership. The recent case of *Roche Molecular*[40] where the court affirmed the principle laid down in the *Dubilier* case that in the absence of contrary agreement, the employer has no right to the employee invention affirms this aspect.

The third question also demands some consideration since most university IP policies which invoke university ownership stress that any use of university facilities, resources and funding will vest ownership of the said IP in the university. Some provisions mention phrases such as 'substantial use', 'incidental use' or supported invention. In this situation how does one assess the amount of usage in order to constitute substantial use and if there is no mention of the substantial use, does any act of using university facilities result in university ownership?

As for the fourth question, an institutional IP policy by itself cannot bind the university employee unless it has been incorporated into the contract of employment as seen in the decision of *Chou* v *University of Chicago*.[39] This decision affirmed that university published patent policies can form an implied contract with an employee provided that the provision is referred into employment contract. Thus it should be noted that, a clear provision regarding ownership of IP created during performance of employee's duties should be inserted into the employment contract in order to avoid any ambiguity regarding this issue later on.

Recently, the university ownership model has been criticized severely and it has been argued that this model does not motivate inventors given the fact that technology licensing offices (TLOs), which are created to assist the transfer and commercialization process, are in fact hurdles in the fast and smooth commercialization of university IP.[24,26,43] There is further evidence that because of lack of incentives to disclose, university inventions are seeking back door exits and academic inventors are choosing to commercialize the inventions by themselves without disclosing their research results to the university.[44] In addition, it has also been argued that in order to develop innovation capacity at the university level, an equitable IP policy should be established instead of aggressive and rigid ones.[45] The provisions of the Bayh–Dole Act or any other analogous provisions granting ownership of IP resulting from publicly funded research to the university should be practised for the betterment of the society. Universities should not lose sight of the main purpose of the Act which is to prevent non-use of the inventions resulting from research funded by the tax payer's money.[46]

In view of the criticisms as illustrated above, there have been suggestions to change the university ownership model to an inventor ownership model.[24,43]

Inventor Ownership Model

The main feature of inventor ownership model is that decisions for dissemination of the invention are decentralized, ownership of IP is vested in the inventor and thus the inventor has the sole right to decide ways to commercialize the invention.[24,43] It is up to the inventor to decide whether to use the services of the university technology transfer office (TTO), or to assign the invention to another organization for commercialization, to commercialize the invention personally or even to place the invention in the public domain. Thus, the advantage is that university inventors are able to make informed choices regarding invention and marketing strategies besides just submitting their inventions to TTOs.[24,43,47]

However, the inventor ownership model can seem less promising in some aspects as compared to university ownership model.[43,47] According to Greenbaum and Scott, for this model to be actualized, it is required that the university inventors are self motivated to invent and are substantially business savvy.[47] Evidence suggests that most of the patents developed by academics in Europe is not owned by the university but by trading companies. This is because most universities in Europe adopt the 'professor privilege' rules where inventions by professors at the university are not owned by their employers but managed by the professors themselves.[48] Additionally, another good example is the University of Waterloo in Canada that practises a system of inventor ownership of IP.[24,49]

Kenney and Patton find that universities using an inventor ownership model have more advantages than universities employing an employer ownership model.[18] Among the advantages are:

(1) Universities with inventor ownership model are capable of creating a greater number of spin off companies compared to universities with employer ownership model.

(2) Ownership of IP by the inventor will reduce the barriers between inventor and the market to commercialize his invention, *vis-à-vis* assignment of ownership to university TTOs.[26,43]

(3) There will be more efficient transmission of R&D fund to university startup companies.

At the same time, there are disadvantages as well in the inventor ownership model and these disadvantages relate to the inadequacies of inventors in commercialization. Inventors, who are normally academicians, are not trained to be business-minded and may not know the best way to introduce their product into the market.[43,47] Commercializing university IP needs big investment since the inventions are normally at the embryonic stage and require to be developed further to be accepted as a commercial product.[50] Thus, obtaining outside investments will be the biggest task for inventors before they can proceed to commercialization.[50] In this event, TTOs may be better situated to ensure successful IP commercialization.

Considering the above advantages and disadvantages, emerging entrepreneurial universities should experiment with inventor ownership models instead of simply following the university ownership model. It should be noted that, even though statutory requirements in certain countries mandate that employer own his employees' inventions, this general principle could be overridden by agreements stating otherwise.

The University of Waterloo is one of the most successful entrepreneurial universities in Canada which uses an IP ownership model unlike any other celebrated universities.[18,24,25] It has been a motto at this university that 'everything you discover at Waterloo belongs to you'.

Under Policy 73 of the University of Waterloo, ownership of IP is vested in the creator even though it is contrary to the provisions under patent and copyright law in Canada. This policy works as an agreement to the contrary which affirms the university intention on this matter. However, in situations where university specifically assigns such work to the creator, then the ownership of IP vests in the university.

While the creator is allowed to retain ownership of IP created in the course of employment, the university retains a non-exclusive, free, irrevocable licence to copy and/or use such works in other teaching and research activities. Besides, the creator is expected to acknowledge the university as the place of research and also any indirect contribution by the university.

However, it should be noted that if the inventor opts to use university assistance in executing the patent rights, he needs to assign all the rights in patent to the university.

IP Ownership Model in Malaysia

Under the Malaysian law, the relevant provision on employee inventions or copyrightable works falls under Section 20(1) of Patent Act 1983 and Section 26(2) Copyright Act 1987.

Besides the statutory provisions, most Malaysian universities also have their own IP policy aimed at safeguarding and managing the IP generated in the university. However, any such institutional IP policy must be consistent with the National Intellectual Property Policy (NIPP) and the Intellectual Property Commercialisation Policy for Research & Development Projects Funded by the Government of Malaysia (June 2009) prepared by the Ministry of Science, Technology and Innovation (MOSTI Policy).

According to the MOSTI policy, there are three key issues that need to be taken into account in deciding employee invention at the university. These are whether the (i) invention was created in the course of employment; (ii) invention was commissioned by

the employer and (iii) invention made use of employer resources. In all these circumstances, the employer is the rightful owner of IP created unless there is an agreement to the contrary.

Table 3 illustrates the ownership provisions in the IP policies of five illustrative Malaysian research universities.

Until recently, there were no reported cases in Malaysia on ownership issues involving employee inventions in a university. However, there is no doubt that IP policies provided by each university alone might not be adequate to determine the ownership of IP created within the university, keeping in mind the existence of statutory provisions. One of the most recent cases is the *Soon Seng Palm Oil Mill (Gemas) Sdn Bhd & Ors* v *Jang Kim Luang @ Yeo Kim Luang &* Ors.[51] This case involved a dispute between the former directors and the oil palm division of the Soon Seng Group (the SSPO Division) and was regarding employer-related equipment designed to shred fibres (the shredder). The first defendant was a former director/chief executive of the SSPO Division. The plaintiffs claimed that the first defendant had breached fiduciary duties and duties of trust/care by

Table 3 – IP ownership at Malaysian research universities

University	University Kebangsaan Malaysia	Universiti of Malaya	Universiti Sains Malaysia	Universiti Putra Malaysia	Universiti Teknologi Malaysia
Provision under the IP policy	Section 4.1	Section 5	Section 4	Section 5	Part 3
IP created by employee	The university owns: 1. IP created in the course of employment 2. IP generated from the use of university resources 3. IP created due to direct request from the university, and 4. IP created pursuant to agreement with associates	The university owns: 1. IP created in the course of employment 2. IP created due to direct request of the university, and 3. IP created in pursuant to agreement with third party	The university owns: 1. IP created in the course of employment or contract 2. IP created due to direct request from the university 3. IP created in pursuant to agreement with third party, and 4. IP created using resources or facilities from the university	The university owns IP created in the course of employment	The university owns IP created in the course of employment
IP created outside office hour	1. IP created without using facilities or resources of the university is owned by the employee 2. University owns non-exclusive rights as long as it does not violate moral rights of the author	1. University will not claim any right as long as the IP is not created with the use of university resources or facilities 2. Employee may transfer IPR to the university in accordance to mutually agreed terms	-	-	1. University will not claim any right over the IP 2. University can use the IP for the purpose of teaching and research
IP created by student	IP owned by student unless university resources have been used	IP owned by student unless university resources have been used	IP owned by university if created using university resources	IP owned by the university if created by student in the course of his/her study	IP owned by university

Source: IP policies of the respective Malaysian research universities

misappropriating and converting the second plaintiff's invention for her own. Other defendants were her business partners and a company owned by the first defendant. The plaintiff also claimed that the first defendant violated the law when manufacturing the equipment arising from an invention patented in the defendant's name besides others.

In his ruling, Judge Azahar Mohamed decided that there were three things that need to be proved to enable employers to claim a right under Section 20(1) of the Patents Act, 1983, namely, that:

(1) the first defendant was an employee and there was a contract of employment with the plaintiff;

(2) the first defendant had undertaken various activities in the implementation of employment contracts that led to the incident; and

(3) there was nothing contrary in the contract of employment which suggested that the first defendant could claim ownership rights to that creation.

Facts of the case showed that the first defendant was an employee based on the evidence that she drew her salary and the proof of executive functions such as signing of payment vouchers, a signed a letter saying she was in charge of the company responsible for appointing staff, etc.

The second condition that required to be proved was that the invention was made during the implementation or performance of the contract of employment. In this case, the court found that the first defendant had performed her duties and responsibilities to foster research and development in the plaintiff company. The first defendant had also suggested to the directors of the plaintiff's company to cater the problem of empty palm oil fruit shells and then turned it into a profitable investment.

Judge Azahar then gave his dictum;

> ' …from the moment the first defendant was entrusted to look into ways of converting EFB into fibre, from that point in time, she was imposed with an obligation to carry out all activities for the benefit of the plaintiff companies and is therefore caught under s 20(1) of the Act. The first defendant is in fact a trustee of the invention and bound to give the benefit of all steps taken by her to her employer.'

The court also held that Section 20 did not necessarily mean that the employee had to actually invent, it was enough if the invention resulted from the performance of duties by an employee and that each invention was deemed to accrue to the employer.

The third condition to be satisfied was that there was no contract that granted the ownership rights to the employee. In this instance, the court did not find any contract that prevented the employer, that is the plaintiff, from obtaining the invention and thus decided that the second plaintiff was the owner of all rights derived from the patented invention.

This case clearly illustrated the manner in which Section 20(1) of the Patents Act, 1983 worked and that the employer was entitled to ownership of patents for inventions created by employees. At the same time, it is accurate to say that proof of employment alone is not enough for employers to claim ownership of inventions created by employees as has been determined in cases outside Malaysia.

Thus in order for an university to claim IP created by its employee, it is important for it to prove that the inventor is an employee of the university with an employment contract, that the inventor has carried out various tasks in performance of his contract of employment resulting in the invention and that there is no contract that provides against such ownership.

Therefore it is essential for the university to spell out clear provisions of IP ownership in the contract of employment and also the duties and responsibilities to be undertaken by each employee.

From the above discussion it is amply clear that Malaysian universities follow the university ownership model. However, these universities have a long way to go in terms of the volume of inventions and innovations to be on the same level as other top universities in the world. According to Dr Shahid, World Bank Economic advisor, Malaysian universities, institutes, research culture and start ups are still weak and Malaysia may need another five to ten years in order to be a innovation hotspot, provided that Malaysian government give full commitment to raise the quality of education and provide generous research funding schemes.[52]

Conclusion

Even though university ownership models have been used widely all over the world and they have been a great success for universities in the United States, United Kingdom and many other countries, the success rate is still low as compared to the failure rate. Thus, for the countries of emerging economies such as Malaysia it is not too late to try a different ownership model in their universities in order to encourage innovations and commercialization.

Practices and achievements at the University of Waterloo, Canada could be a benchmark to measure accomplishments in Malaysian universities after adopting the inventor ownership model.

References

1 Dix M O & Culver T R, Establishing and restructuring IP management processes: Issues and models, *Journal of Law & Technology*, 35 (2004) 543.

2 Youtie J and Shapira P, Building an innovation hub: A case study of the transformation of university roles in regional technological and economic development, *Research Policy*, 37 (8) (2008) 1188-1204.

3 Etzkowitz H *et al.*, The future of the university and the university of the future: Evolution of ivory tower to entrepreneurial paradigm, *Research Policy*, 29 (2) (2000) 313-330.

4 Etzkowitz H, Research groups as 'quasi-firms': The invention of the entrepreneurial university, *Research Policy*, 32 (1) (2002) 109-121.

5 Rothaermel F T, Agung S D & Lin J, University entrepreneurship: A taxonomy of the literature, *Industrial and Corporate Change*, 16 (4) (2007) 691-791.

6 Wan Mohd Hirwani Wan Hussain *et al.*, Embedding the importance of commercialisation of university's research in the engineering education in Malaysia, *Applied Mechanics and Materials*, 44-47 (2010) 3514.

7 Hudson J & Minea A, Innovation, intellectual property rights, and economic development: A unified empirical investigation, *World Development*, 46 (2013) 66–78.

8 Griffith R, Miller H & O'Connell M, Ownership of intellectual property and corporate taxation, *Journal of Public Economics*, 112 (2014) 12–23.

9 Fan J P H, Gillan S L and Yu X, Innovation or imitation? The role of intellectual property rights protections, *Journal of Multinational Financial Management*, 23 (2013) 208–234.

10 Maskus K E, *Private Rights and Public Problems: The Global Economics of Intellectual Property in the 21st Century* (Peterson Institute for International Economics, United States), 2012, p. 25-82.

11 Akiyama T & Furukawa Y, Intellectual property rights and appropriability of innovation, *Economics Letters*, 103 (2009) 138–141.

12 Shemdoe G S, Introduction to intellectual property rights for investigators in health research and institutional intellectual property policy, *Acta Tropica*, 112S (2009) S80–S83.

13 Shane S, Encouraging university entrepreneurship? The effect of the Bayh –Dole Act on university patenting in the United States, *Journal of Business Venturing*, 19 (2004) 127-151.

14 Walter T *et al.*, Grace, gold, or glory? Exploring incentives for invention disclosure in the university context, *Journal Technology Transfer*, February (2013).

15 Seymore S B, My Patent, your patent, or our patent? Inventorship disputes within academic research groups, *Albany Law Journal of Science & Technology*, 16 (2006) 125.

16 Hannabuss S, Intellectual property rights and university employees, *Library Review*, 50 (3) (2001) 117-122.

17 Monotti A L, Is it time to codify principles for ownership of academic employee inventions? The disconnect between policy and the law, *Monash University Law Review*, 38 (2012) 102.

18 Kenney M and Patton D, Does inventor ownership encourage university research-derived entrepreneurship? A six university comparison, *Research Policy*, 40 (8) (2011) 1100-1112.

19 So A D *et al.*, Is Bayh-Dole good for developing countries? Lessons from the US experience, *PloS Biology*, 6 (10) (2008) 2078.

20 Sampat B N, Patenting and US academic research in the 20th century: The world before and after Bayh Dole, *Research Policy*, 35 (6) (2006) 772-789.

21 Sampat B N, The Bayh-Dole model in developing countries: Reflections on the Indian Bill on Publicly Funded Intellectual Property, Policy Brief Number 5, UNCTAD-ICSTD, 2009.

22 Atkinson R C & Blanpied W A, Research universities: Core of the US science and technology system, *Technology in Society*, 30 (1) (2008) 30-48.

23 Stephen T K, Asian initiatives on Bayh-Dole, with special reference to India: How do we make it more "Asian?", *Chicago-Kent Journal of Intellectual Property*, 10 (2010) 44.

24 Kenney M and Patton D, Reconsidering the Bayh- Dole Act and the current university invention ownership model, *Research Policy*, 38 (9) (2009) 1407-1422.

25 Bramwell A & Wolfe D A, Universities and regional economic development: The entrepreneurial University of Waterloo, *Research Policy*, 37 (8) (2008) 1175-1187.

26 Grimaldi R *et al.*, 30 years after Bayh–Dole: Reassessing academic entrepreneurship, *Research Policy* 40 (8) (2011) 1045– 1057.

27 Bathelt H, Kogler D F & Munro A K, A knowledge-based typology of university spin-offs in the context of regional economic development, *Technovation* 30 (9-10) (2010) 519–532.

28 Ramli N *et al.*, The concept of research university: The implementation in the context of Malaysian University System, *Asian Social Science*, 9 (5) (2013) 307-317.

29 Swamidass P M, University startups as a commercialization alternative: Lessons from three contrasting case studies, *J Technology Transfer*, 38 (6) (2013) 788-808.

30 Gibbons L J, Tech transfer: Everything (patent) is never quite enough, *University of Louisville Law Review*, 48 (4) (2010) 843.

31 Chew P K, Faculty-generated inventions: Who owns the golden egg?, *Wisconsin Law Review*, 75 (1992) 259.

32 Pisegna-Cook E D, Ownership rights of employee inventions: The role of preinvention assignment agreements and states statutes, *University of Baltimore Intellectual Property Law Journal*, 2 (1994) 163.

33 *United States* v *Dubilier Condenser Corporation*, 289 US 178, 188, 53 S. Ct. 554, 77L.Ed. 1114 (1933).

34 Cox D B, Academic dilemma? Antipodean and new world directions on the ownership of inventions, *Journal of Intellectual Property Law & Practice*, 7 (2) (2012) 135-145.

35 Marcedo C R *et al.*, Bayh-Dole Act does not override employees' rights to unassigned inventions, *Journal of Intellectual Property Law & Practice*, 6 (11) (2011) 760-763.

36 Van Slyke P C & Friedman M M, Employer's rights to inventions and patents of its officers, directors and employees, *AIPLA Quarterly Journal*, 18 (1990) 127.

37 Lieberstein M A, Employers beware: Will you own your employee's inventions?, *Hastings Business Law Journal*, 1 (2005) 183.

38 Hedvat S H, A new age of pro-employer rights: Are automatic assignments the standard?, *University of Pennsylvania Journal of Business Law*, 13 (2011) 817.
39 *Joany Chou* v *The University of Chicago and Arch Development Corporation*, 254 F.3d 1347, 1358 (Fed Cir, 2001).
40 *Board of Trustees of the Leland Stanford Junior University* v *Roche Molecular Systems Inc*, Et Al 180 L. Ed. 2d 1; 2011 U.S. LEXIS 4183.
41 *University of Western Australia* v *Gray* (no 2), 34 [2008] FCA 498.
42 *Building Innovation Industries LLC* v *Yelena Onken*, 473 F.Supp.2d 978 (2007).
43 Litan R E, Mitchell L & Reedy E J, The university as innovator: Bumps in the road, *Issues in Science and Technology*, 4 (2007) 57-66.
44 Panagopoulos A & Carayannis E G, A policy for enhancing the disclosure of university faculty invention, *Journal of Technology Transfer*, 38 (2013) 341–347.
45 Okamura H & Nishimura J, Impact of university intellectual property policy on the performance of university-industry research collaboration, *Journal of Technology Transfer*, 38 (2013) 273–301.
46 Tyler III J E, Redeploying Bayh-Dole: Beyond merely doing good to optimizing the potential in results of taxpayer-funded research, *Journal of Technology Transfer*, 38 (2013) 911–929.
47 Greenbaum D & Scott C, Hochschullehrerprivileg: A modern incarnation of the professor's privilege to promote university to industry technology transfer, *Science Technology & Society*, 15 (1) (2010) 55-76.
48 Lissoni F, Academic inventors as brokers, *Research Policy*, 39 (7) (2010) 843-857.
49 Hoye K A, *University Intellectual Property Policies and University-Industry Technology Transfer in Canada*, Ph D Dissertation, University of Waterloo, Ontario, Canada, 2006.
50 Woods M S, A process model of academic entrepreneurship, *Business Horizons*, 54 (2) (2011) 153-161.
51 *Soon Seng Palm Oil Mill (Gemas) Sdn Bhd & Ors* v *Jang Kim Luang @ Yeo Kim Luang & Ors* [2011] 9 MLJ 496.
52 Izwan Idris, Local universities research culture and start-up activities still weak, The Star, 20 November 2009.